Audi A3 1997 ➤

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

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List of Workshop Manual Repair GroupsList of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Audi A3 1997 ➤

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

Repair Group

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40 - Front suspension

42 - Rear suspension

44 - Wheels, Tyres, Wheel alignment

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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

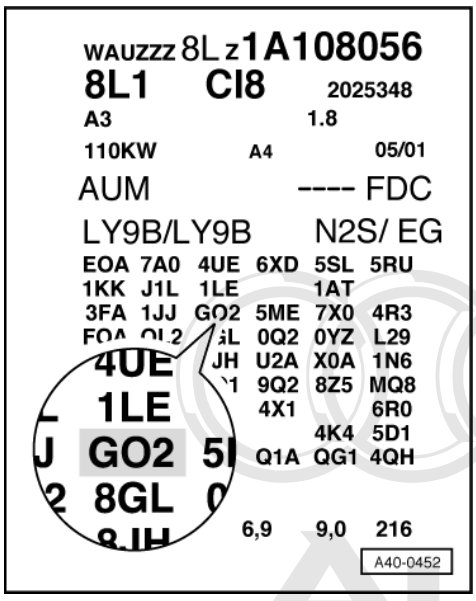
1 - Technical data

1.1 - Technical data

1.2 - Running gear

	FWD	4WD
Front axle	Suspension struts with lower transverse link Subframe Anti-roll bar	
Rear axle	Torsion beam axle with separate spring/ damper arrangement Tubular anti-roll bar	Dual-link trailing arm suspension with separate spring/damper arrangement Subframe Anti-roll bar
Wheelbase mm	2513	Audi A3: 2518 Audi S3: 2519
Front/rear track width mm	1513 / 1495	Audi A3: 1513 / 1489 Audi S3: 1527 / 1503

1.3 - PR no./running gear assignment



-> The running gear version installed in the vehicle can be seen from the corresponding PR number on the vehicle data sticker.

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

The PR no. indicates the correct spring/damper combination.

=> Parts List

Running gear		PR numbers
Audi A3 FWD (1X0)	Standard running gear	1GA / 1GC / 1GE / 1GF / 1GG / 1GJ / G01 / G02 / G07 / G65
	Sports running gear	1GD / 1GK / 1GL / G03 / G08 / G66 / G94
	Heavy-duty running gear	1GB / 1GN / G05 / G89
Audi A3 4WD (1X1)	Standard running gear	1GA / 1GC / 1GE / 1GF / 1GG / 1GJ / G01 / G42 / G07 / G68
	Sports running gear	1GD / 1GK / 1GL / 1GX / G08 / G43 / G69 / G95
	Heavy-duty running gear	1GB / 1GN / G05 / G89
Audi S3	Standard running gear	1GQ / G21
	Sports running gear	G93

1.4 - Wheels, tyres

General information on wheel/tyre combinations, winter tyres, snow chains, recommended tyre makes

=> Guide to wheels and tyres

1.5 - Steering

	FWD and 4WD
Steering box	Power-assisted, maintenance-free rack-and-pinion steering
Number of steering wheel turns from lock to lock	2.75
Maximum steering angle at inside wheel	Audi A3: 38°36' Audi S3: 38°53'
Turning circle dia.	approx. 10.9 m

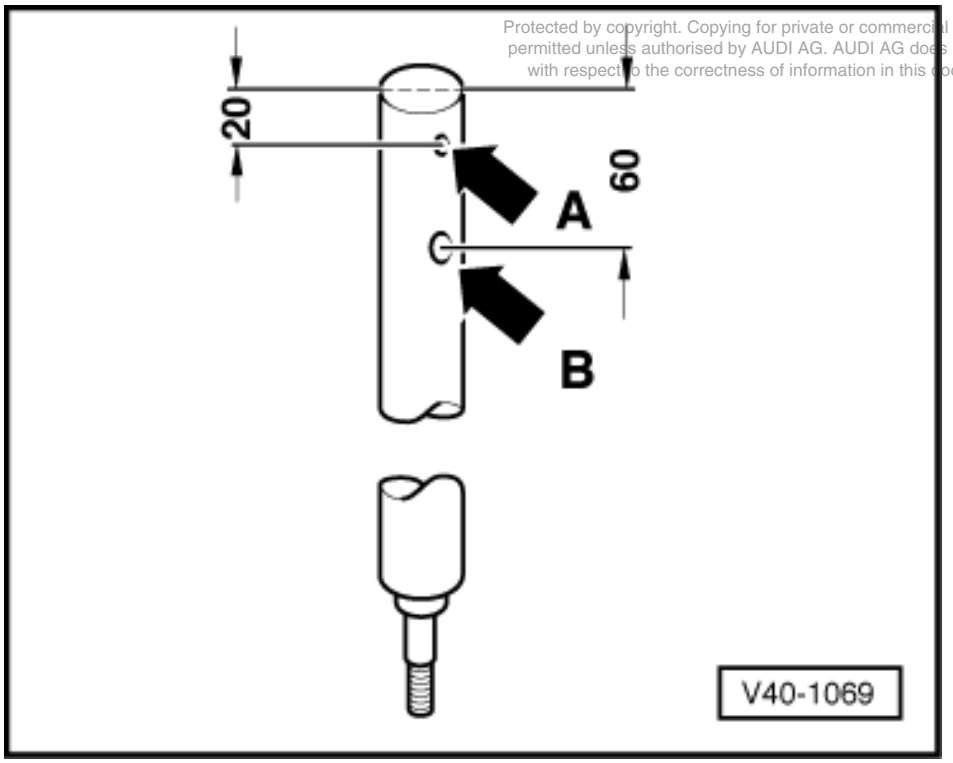
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2 - Prescribed disposal procedure for oil-filled components

2.1 - Prescribed disposal procedure for oil-filled components

2.2 - Releasing gas from front gas-filled shock absorber

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A - Drilling open

- -> Clamp gas-filled shock absorber vertically in vice with piston rod facing downwards.

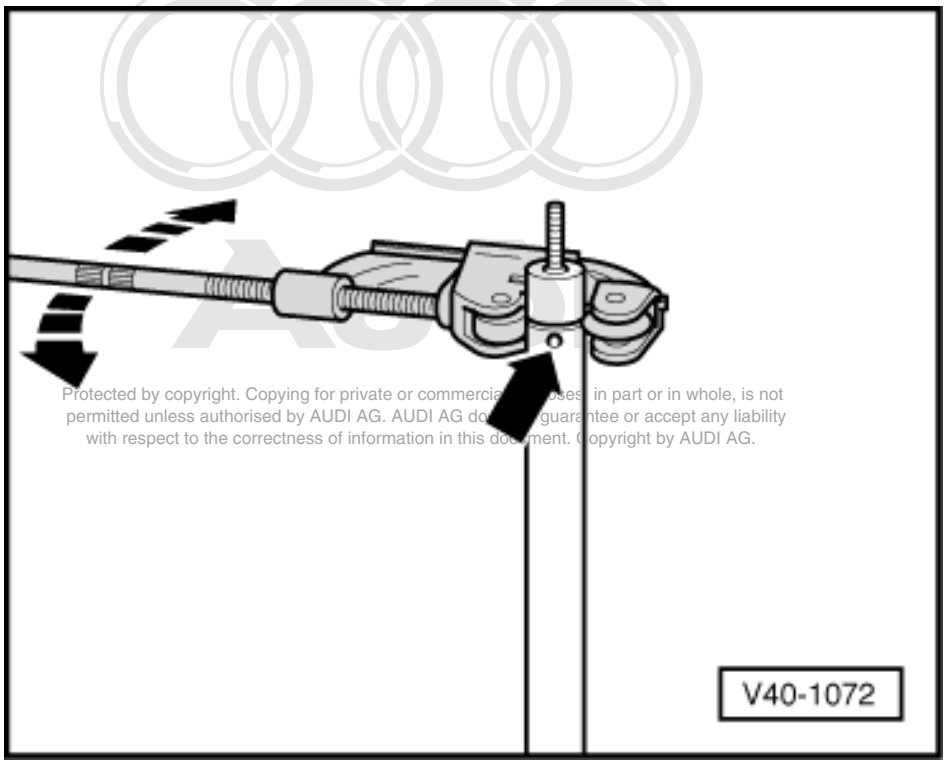
Attention: Wear safety goggles whilst drilling.

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

Note:

Gas escapes whilst doing so.

- Keep drilling until inner tube is penetrated (approx. 25 mm deep).
- Drill second ø 6 mm hole -arrow B- through outer and inner tube of shock absorber.
- Hold damper over a drip tray and execute full piston rod stroke several times until no further oil emerges.



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B - Opening with pipe cutter

Attention: Wear safety goggles whilst drilling/sawing.

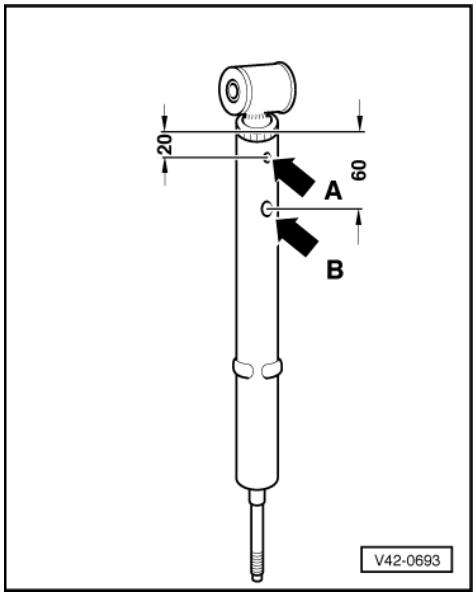
- -> Drill ø 3 mm hole -arrow- through outer tube of shock absorber/saw through tube wall.

Note:

Gas escapes whilst drilling/sawing.

- Apply pipe cutter (e.g. Stahlwille Express 150/3) as shown and cut through outer tube.
- Pull up piston rod; in doing so, hold inner tube with pliers and press tube downwards such that it remains in outer tube on slowly pulling up piston rod.
- Pull piston rod off inner tube.
- Drain shock absorber tube.

2.3 - Releasing gas from rear gas-filled shock absorber



A - Drilling open

- -> Clamp gas-filled shock absorber vertically in vice with piston rod facing downwards.

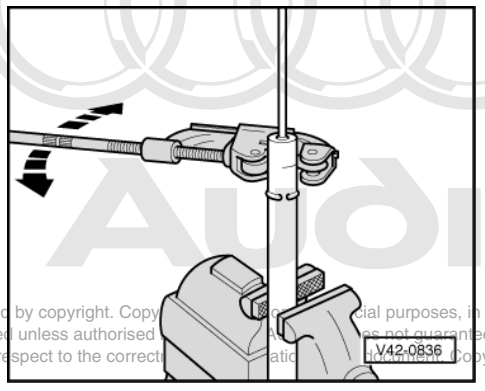
Attention: Wear safety goggles whilst drilling.

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

Note:

Gas escapes whilst doing so.

- Keep drilling until inner tube is penetrated (approx. 25 mm deep).
- Drill second ø 6 mm hole -arrow B- through outer and inner tube of shock absorber.
- Hold damper over a drip tray and execute full piston rod stroke several times until no further oil emerges.



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B - Opening with pipe cutter

Attention: Wear safety goggles whilst drilling/sawing.

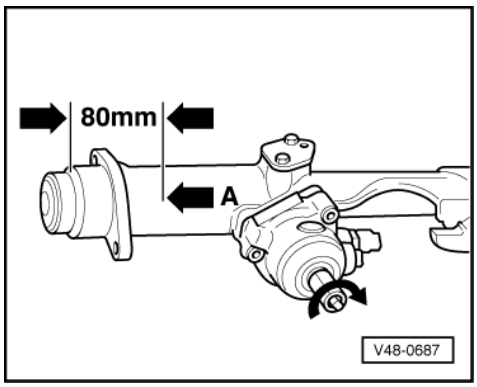
- Drill ø 3 mm hole through outer tube of shock absorber/saw through tube wall.

Note:

Gas escapes whilst drilling/sawing.

- -> Apply pipe cutter (e.g. Stahlwille Express 150/3) as shown and cut through outer tube.
- Pull up piston rod; in doing so, hold inner tube with pliers and press tube downwards such that it remains in outer tube on slowly pulling up piston rod.
- Pull piston rod off inner tube.
- Drain shock absorber tube.

2.4 - Draining power-assisted steering box

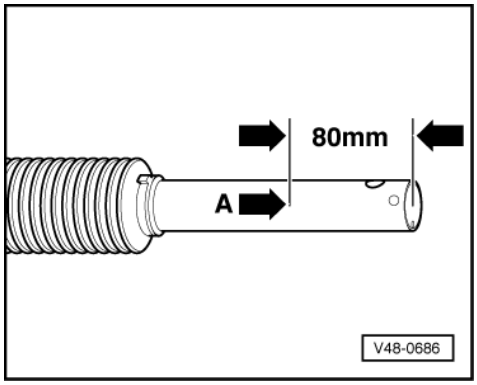


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Note:

When draining steering box, ambient temperature should be at least 20 °C.

- -> Turn steering pinion as far as it will go in direction of arrow.



- -> Clamp steering box horizontally in vice.
- Place drip tray under steering box.
- Saw off steering box at marked location -arrow A-.
- Hold sawn-off steering box over drip tray and allow hydraulic fluid to drain off. If necessary, turn steering pinion as far as opposite stop.

3 - Checking shock absorbers

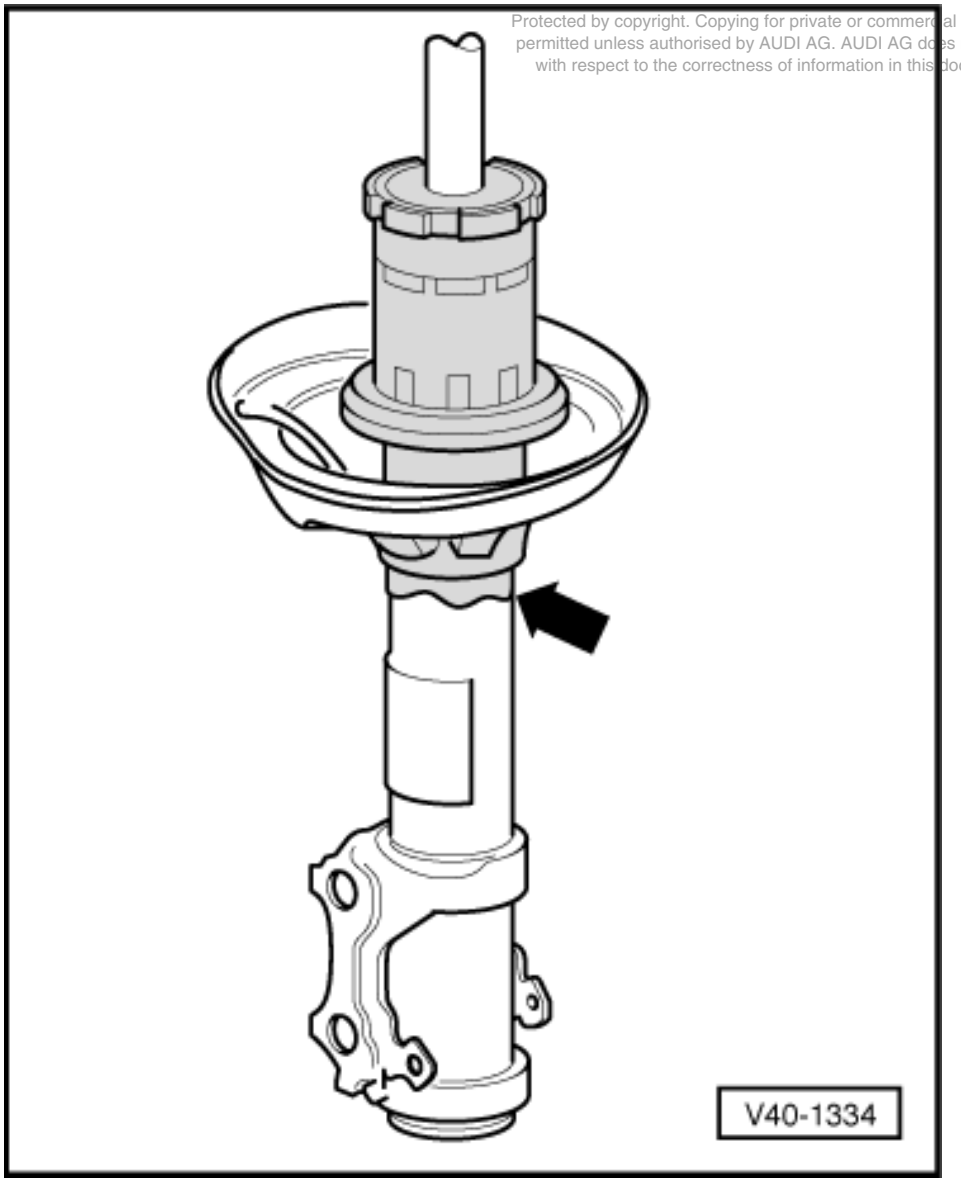
3.1 - Checking shock absorbers

3.2 - Shock absorber leakage

Shock absorbers are often replaced on the basis of complaints about leakage. Test bench and on-the-vehicle studies have revealed that in the majority of cases the complaints received did not justify this action.

The emergence of slight traces of oil ("sweating") at the piston rod seal does not represent grounds for shock absorber replacement. Such oil presence on the shock absorber is acceptable in the following cases:

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- -> Oil emerging is visible (hatched area in illustration), but is dull and matt and possibly also dry and dust-coated
- Emergence of oil is only observed in the range between upper shock absorber seal (piston rod oil seal) and lower spring plate -arrow-

3.3 - Checking shock absorber following removal

Defective shock absorbers become apparent through loud knocking noises whilst driving, particularly on a poor road surface, on account of the wheel "jumping". A further sign is a severe loss of oil on the outside.

Note:

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

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

- Squeeze shock absorber together.
  - Piston rod must move evenly and smoothly over entire stroke
- Release piston rod.
  - Piston rod returns automatically to initial position if there is sufficient gas pressure in shock absorber

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Notes:

- If the above is not the case, the shock absorber need not necessarily be replaced. Provided no major loss of oil has occurred, the mode of operation corresponds to that of a conventional shock absorber.
- The full damping function is retained even without gas pressure, provided there has been no major loss of oil. There may however be a negative effect on noise level.

3.4 - Checking shock absorber on shock tester

A shock tester (shock absorber tester) enables shock absorbers to be checked without removing them. The damping effect can be assessed on the basis of the pointer deflection/printout.

Special tools and workshop equipment required

- Boge shock tester

Or

- Sachs shock tester V.A.G 1975

Or

- Maha shock absorber tester VAS 1990

Test requirements:

- Temperature +10 ... +40 ° C
- Driver in vehicle
- Inflation pressure OK
- Vehicle standing centrally aligned and straight on wheel contact plates
- Front wheels straight ahead
- Handbrake not applied; foot brake not pressed

Limit values

The condition of the shock absorber can only be assessed as follows:

- Adequate damping effect

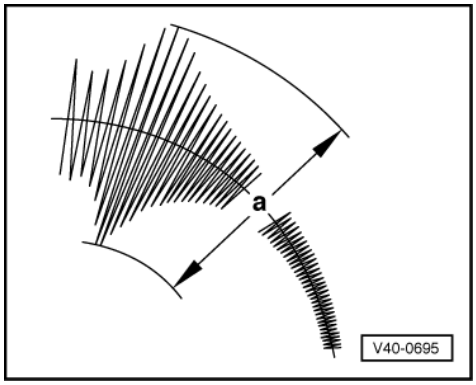
Or

- Inadequate damping effect

Notes:

- Intermediate readings for reduced damping performance are not possible.
- Service life forecasts are not permitted.
- Measured values which include the influence of the spring travel end stops will be biased.

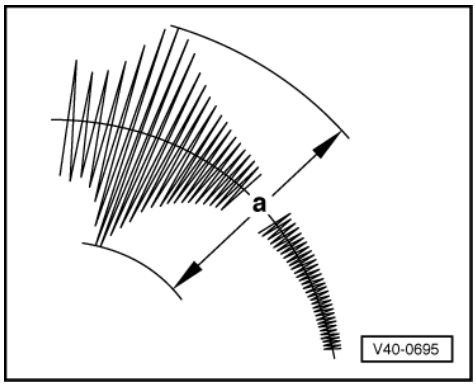
The following values only apply to the above-mentioned test benches. If the stated values are exceeded, less than 50% of shock absorber performance is being obtained and replacement is justified.



-> 1.6 l Front-wheel drive

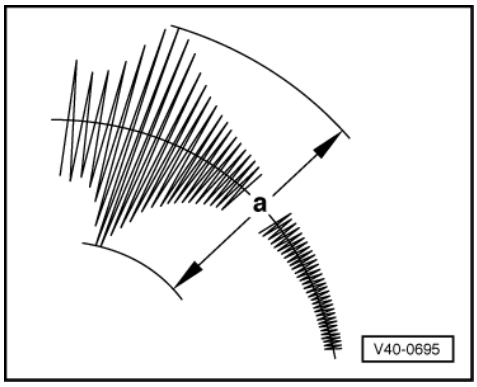
Front axle	Damping effect	
	Inadequate	Adequate
Standard running gear	a = Greater than 60	a = Less than 60
Sports running gear	a = Greater than 42	a = Less than 42
Heavy-duty running gear	a = Greater than 48	a = Less than 48
Rear axle		
Standard running gear	a = Greater than 75	a = Less than 75
Sports running gear	a = Greater than 68	a = Less than 68
Heavy-duty running gear	a = Greater than 68	a = Less than 68

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-> 1.8/1.9 l Front-wheel drive

Front axle	Damping effect	
	Inadequate	Adequate
Standard running gear	a = Greater than 60	a = Less than 60
Sports running gear	a = Greater than 42	a = Less than 42
Heavy-duty running gear	a = Greater than 48	a = Less than 48
Rear axle		
Standard running gear	a = Greater than 74	a = Less than 74
Sports running gear	a = Greater than 68	a = Less than 68
Heavy-duty running gear	a = Greater than 68	a = Less than 68



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-> 1.8/1.9 l Four-wheel drive

Front axle	Damping effect	
	Inadequate	Adequate
Standard running gear	a = Greater than 58	a = Less than 58
Sports running gear	a = Greater than 42	a = Less than 42
Heavy-duty running gear	a = Greater than 50	a = Less than 50
Rear axle		
Standard running gear	a = Greater than 70	a = Less than 70
Sports running gear	a = Greater than 60	a = Less than 60
Heavy-duty running gear	a = Greater than 64	a = Less than 64

Audi S3

	Damping effect	
	Inadequate	Adequate
Front axle	a = Greater than 49	a = Less than 49

	Damping effect	
	Inadequate	Adequate
Rear axle	a = Greater than 50	a = Less than 50

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40 - Front suspension

1 - Servicing front suspension

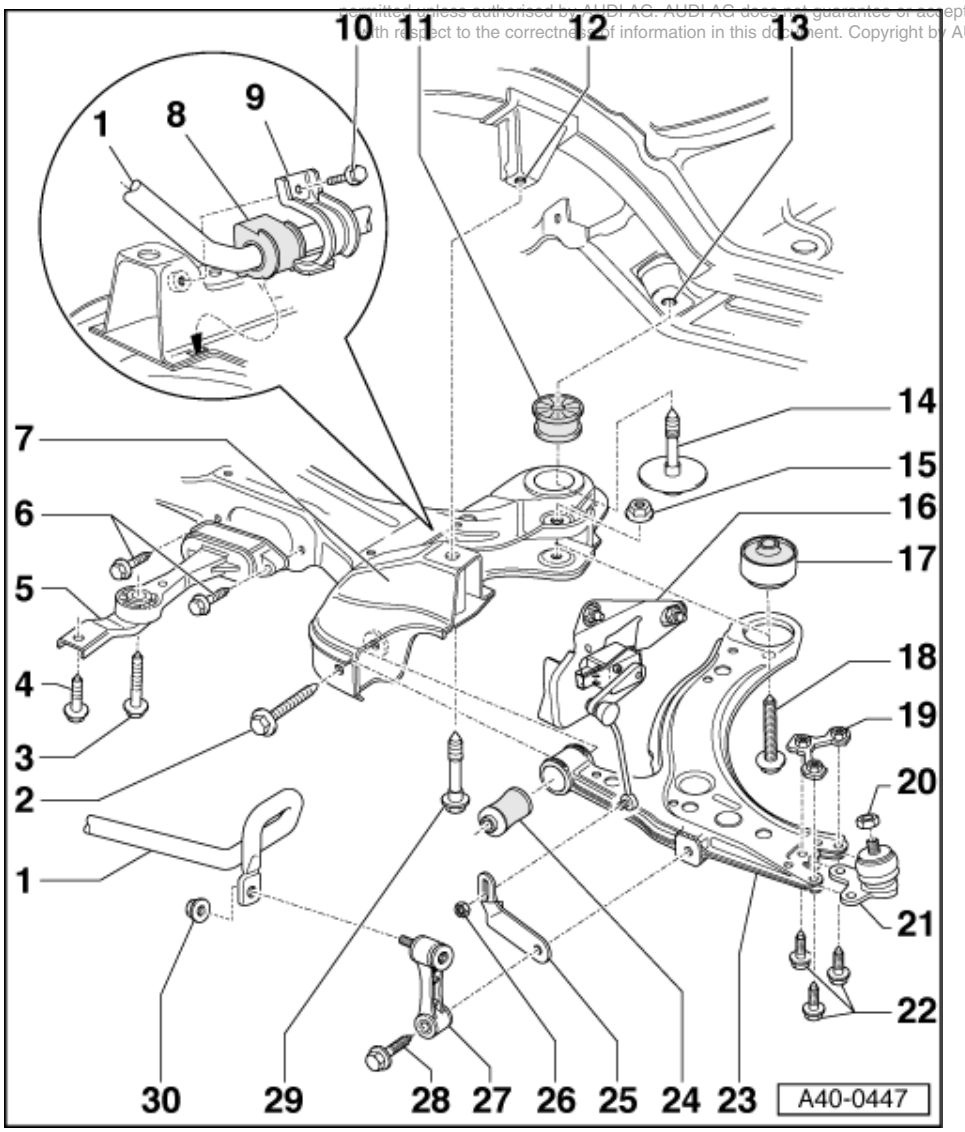
1.1 - Servicing front suspension

General:
Loadbearing and suspension elements are not to be welded and straightened.
If wheel alignment is subsequently to be performed on vehicle, bolts and nuts to be unfastened for adjustment work are only to be tightened to torque. These bolts and nuts are then to be finish-tightened by the prescribed extra turn on completion of wheel alignment/adjustment.

Attention:
All bolts and nuts must be properly tightened on vehicles being used on public roads.

1.2 - Exploded view of components: Subframe, anti-roll bar, wishbone - Audi A3

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1 **Anti-roll bar**
- Removing and installing=>Page 27

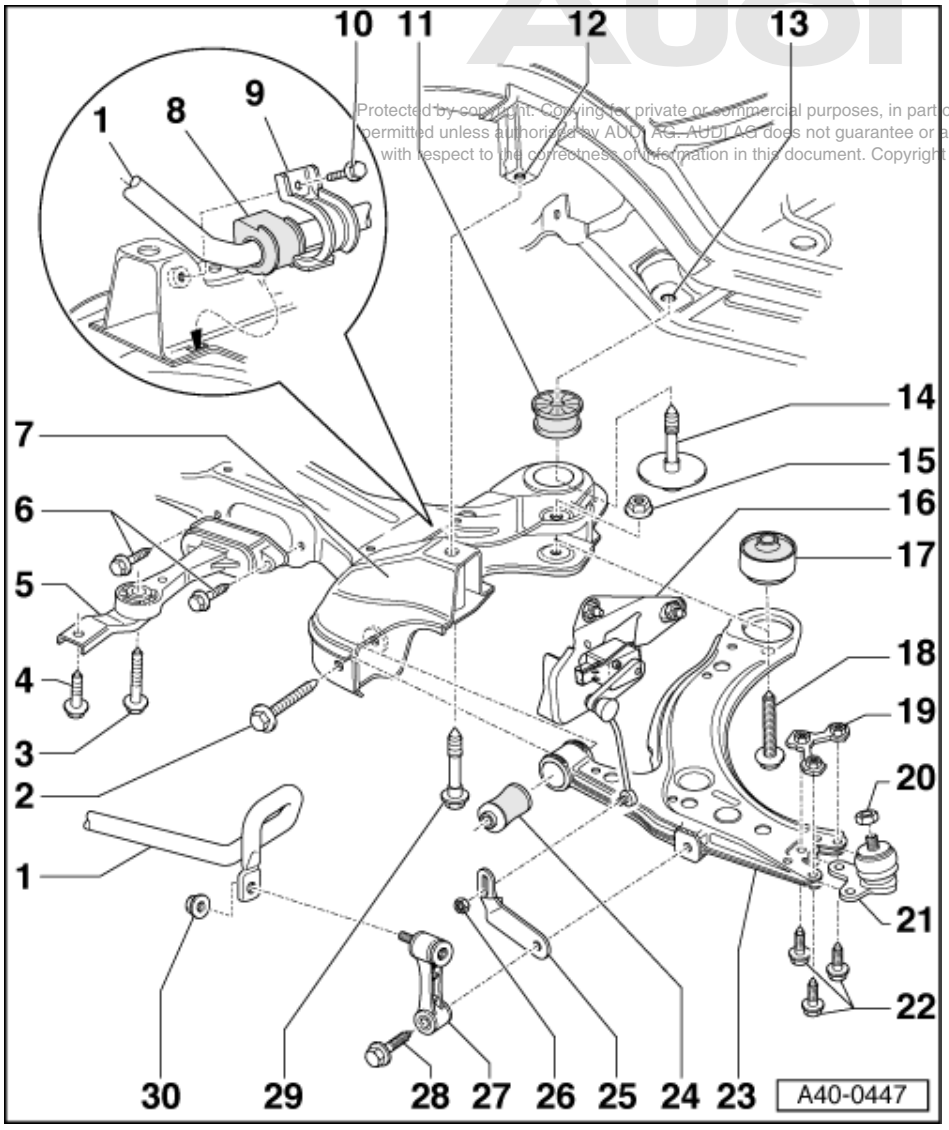
2 **Bolt - 70 Nm + further 90° (1/4) turn**
- Always replace after removing

3 **Bolt - 40 Nm + further 90° (1/4) turn**
- Always replace after removing

4 **Bolt - 40 Nm + further 90° (1/4) turn**
- Always replace after removing

5 **Pendulum support**

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6 **Bolt - 20 Nm + further 90° (1/4) turn**
- Always replace after removing

7 **Subframe**
- Removing and installing=>Page 49

8 **Rubber bush**

9 **Retaining clip**

10 **Bolt, 25 Nm**

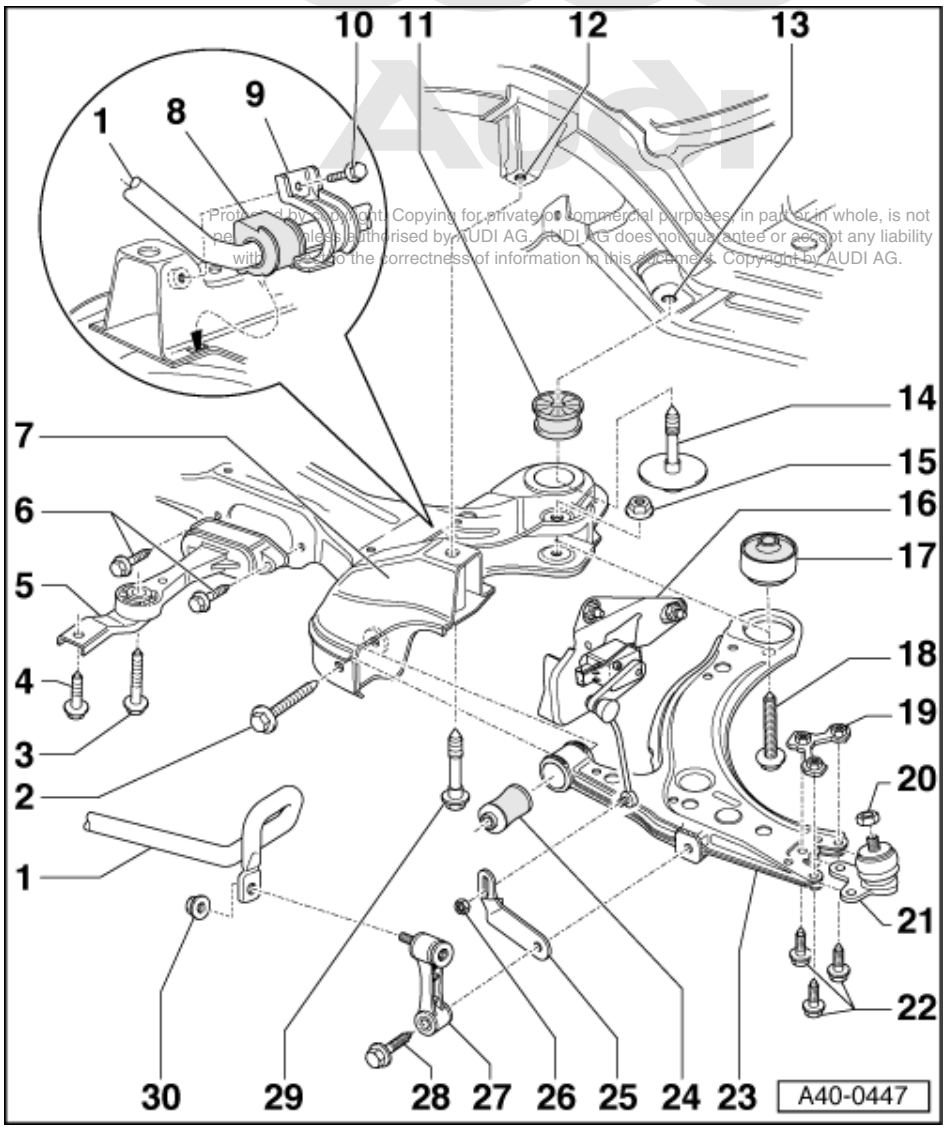
11 **Bonded rubber bush**
- One-piece design
- Replacing => Page 58

12 **Stop block for subframe**

- Repairing thread => Page 22

13 Welding nut in longitudinal member

- Captive nut in stop block cannot be reworked; entire stop block must be replaced if nut is damaged



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14 Bolt - 100 Nm + further 90° (1/4) turn

- Always replace after removing

15 Nut

- Self-locking
- Always replace together with bolt -Item 18 - after removing

16 Front left vehicle level sender -G78

- For vehicles with automatic headlight range control
- Adjustment dimension for bracket with elongated hole => Fig. 1

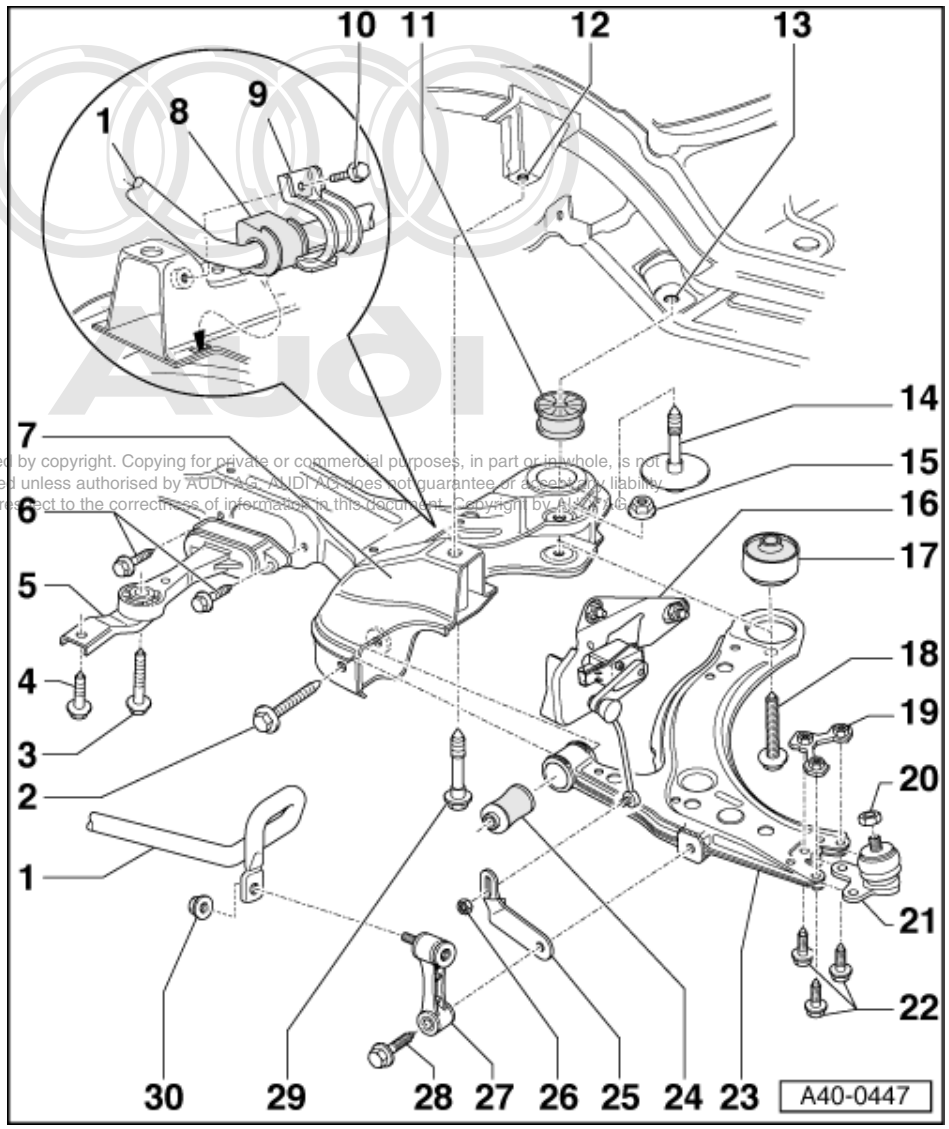
17 Bonded rubber bush

- Replacing => Page 38

18 Bolt - 70 Nm + further 90° (1/4) turn

- Always replace together with nut -Item 15 - after removing

19 Threaded plate



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20 Nut, 45 Nm

- Self-locking
- Always replace after removing

21 Ball joint

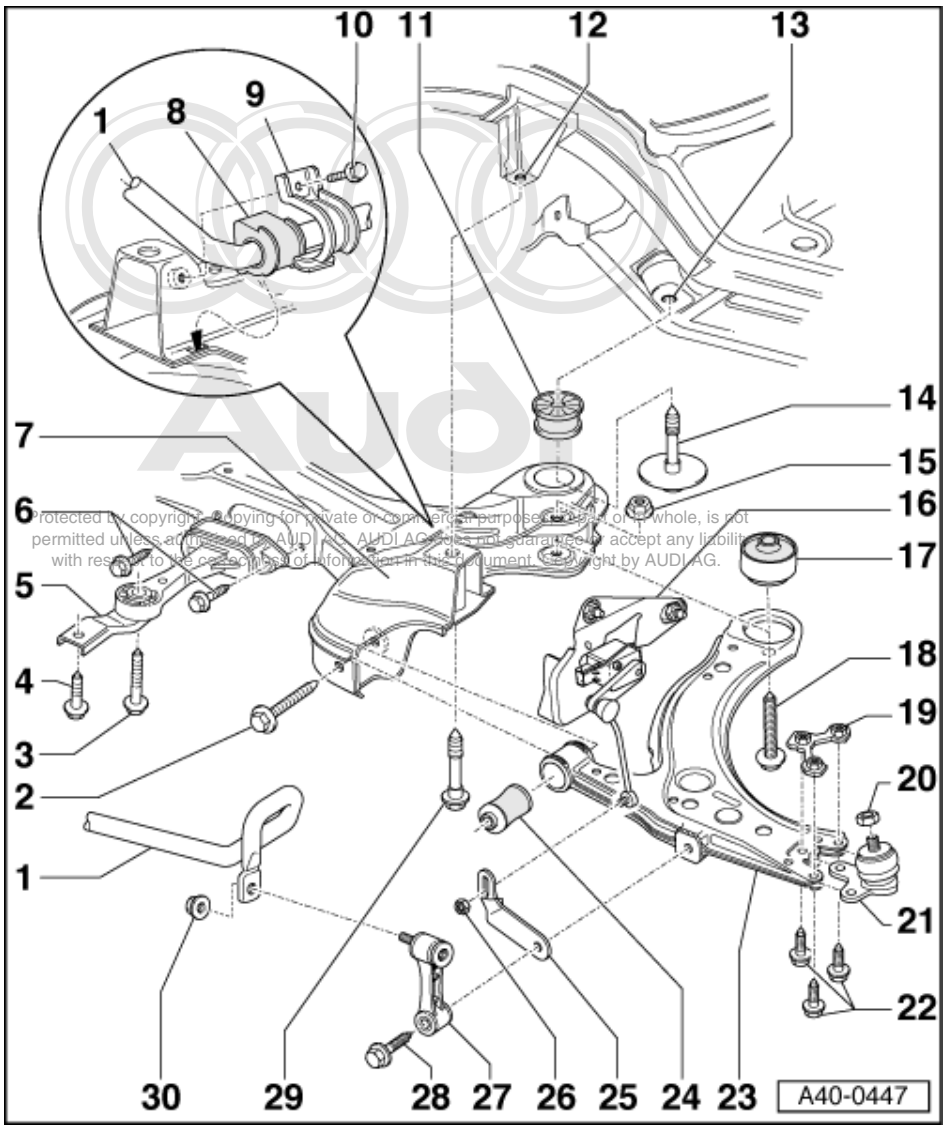
- Checking =>Page 30
- Removing and installing=>Page 32
- Mark installation position; on replacing wishbone, set to centre of elongated hole and check toe/camber
- Wheel alignment => Page 273

22 Bolt - 20 Nm + further 90° (1/4) turn

- Always replace after removing

23 Wishbone

- Removing and installing=>Page 35



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24 Bonded rubber bush

- Replacing => Page 38

25 Bracket

26 Nut, 6 Nm

27 Connecting link

28 Bolt - 15 Nm + further 90° (1/4)turn

- Always replace after removing

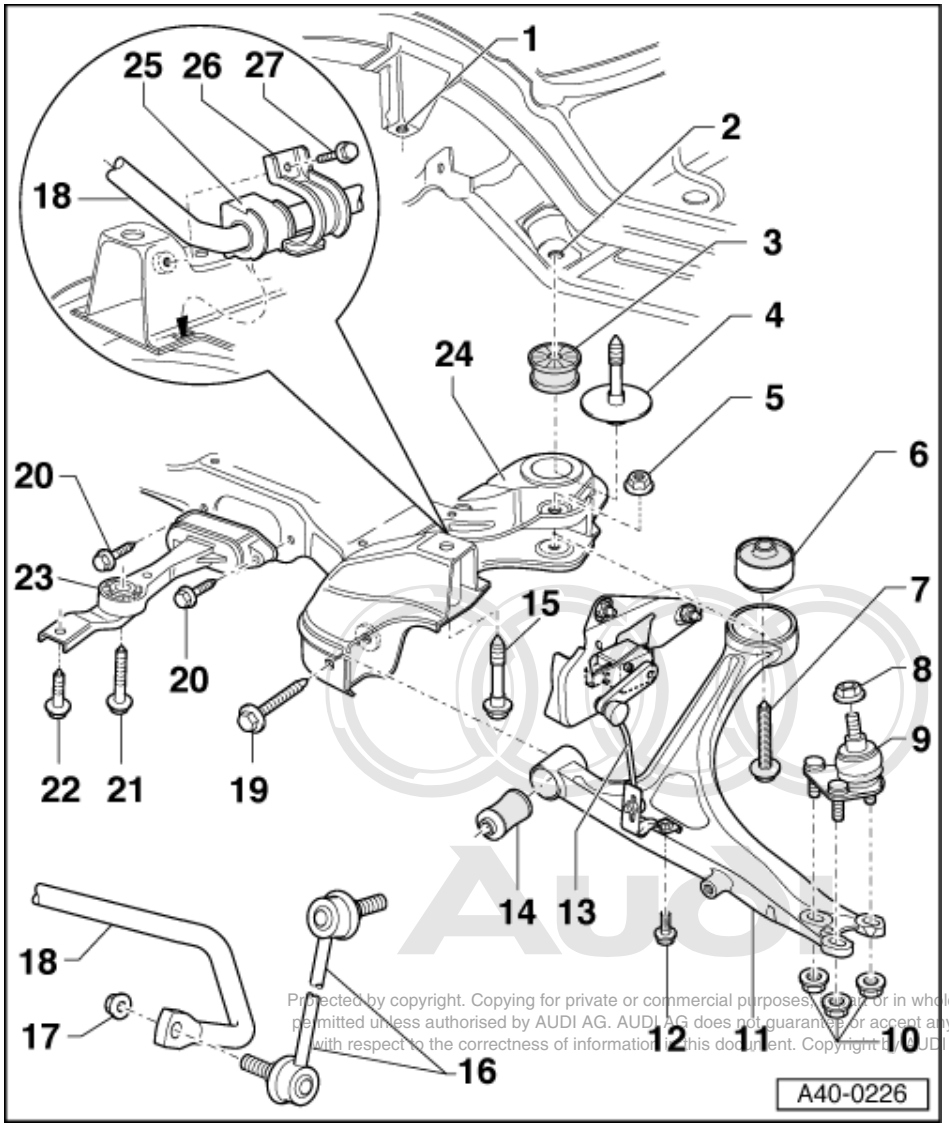
29 Bolt - 100 Nm + further 90° (1/4) turn

- Always replace after removing

30 Nut - 15 Nm + further 90° (1/4)turn

- Self-locking
- Always replace after removing

1.3 - Exploded view of components: Subframe, anti-roll bar, wishbone - Audi S3



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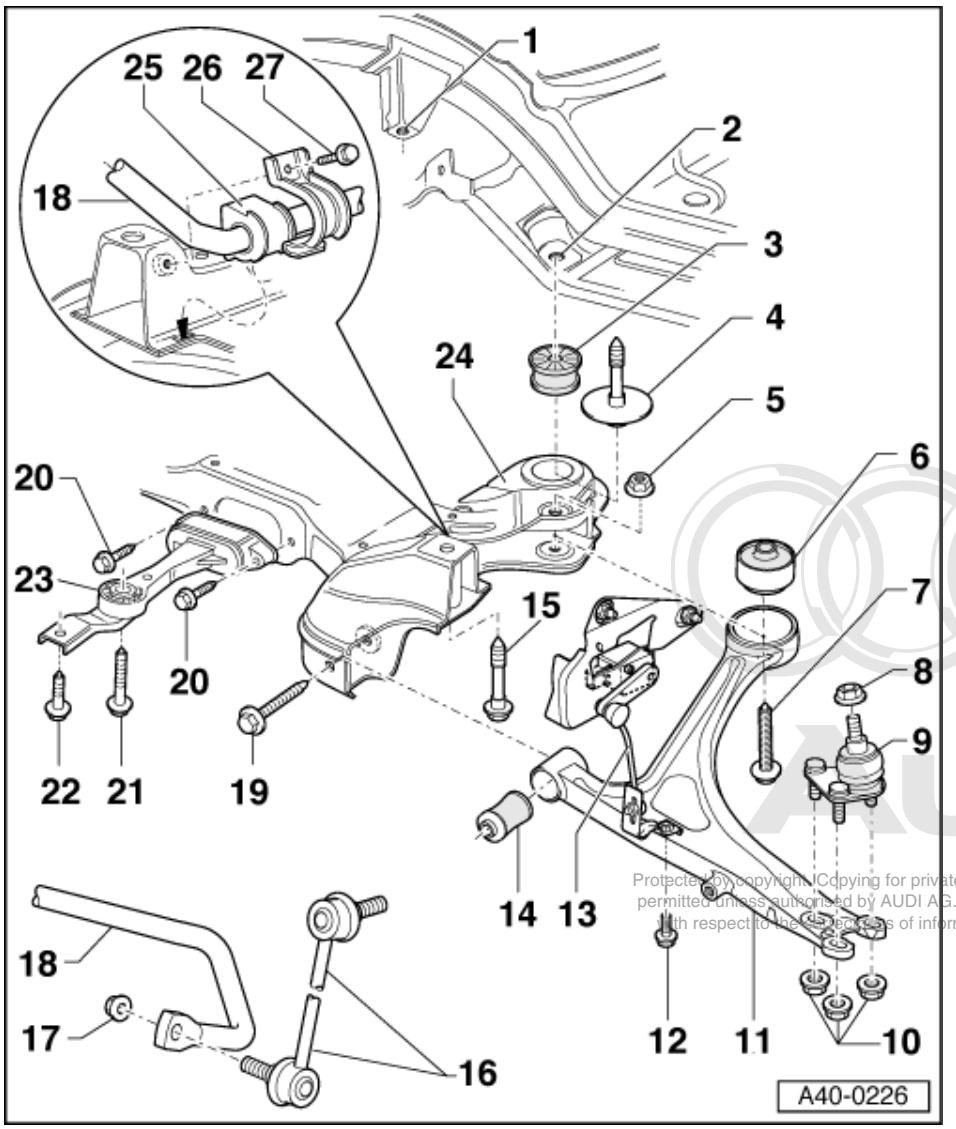
Removing and installing brace for suspension strut dome => Fig. 22

1 **Stop block for subframe**
- Repairing thread => Page 22

2 **Welding nut in longitudinal member**
- Captive nut in stop block cannot be reworked; entire stop block must be replaced if nut is damaged

3 **Bonded rubber bush**
- Two-piece design
- Replacing => Page 60

4 **Bolt - 100 Nm + further 90° (1/4) turn**
- Always replace after removing



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5 Nut

- Self-locking
- Always replace together with bolt -Item 7 - after removing

6 Bonded rubber bush

- Different versions

=> Parts List

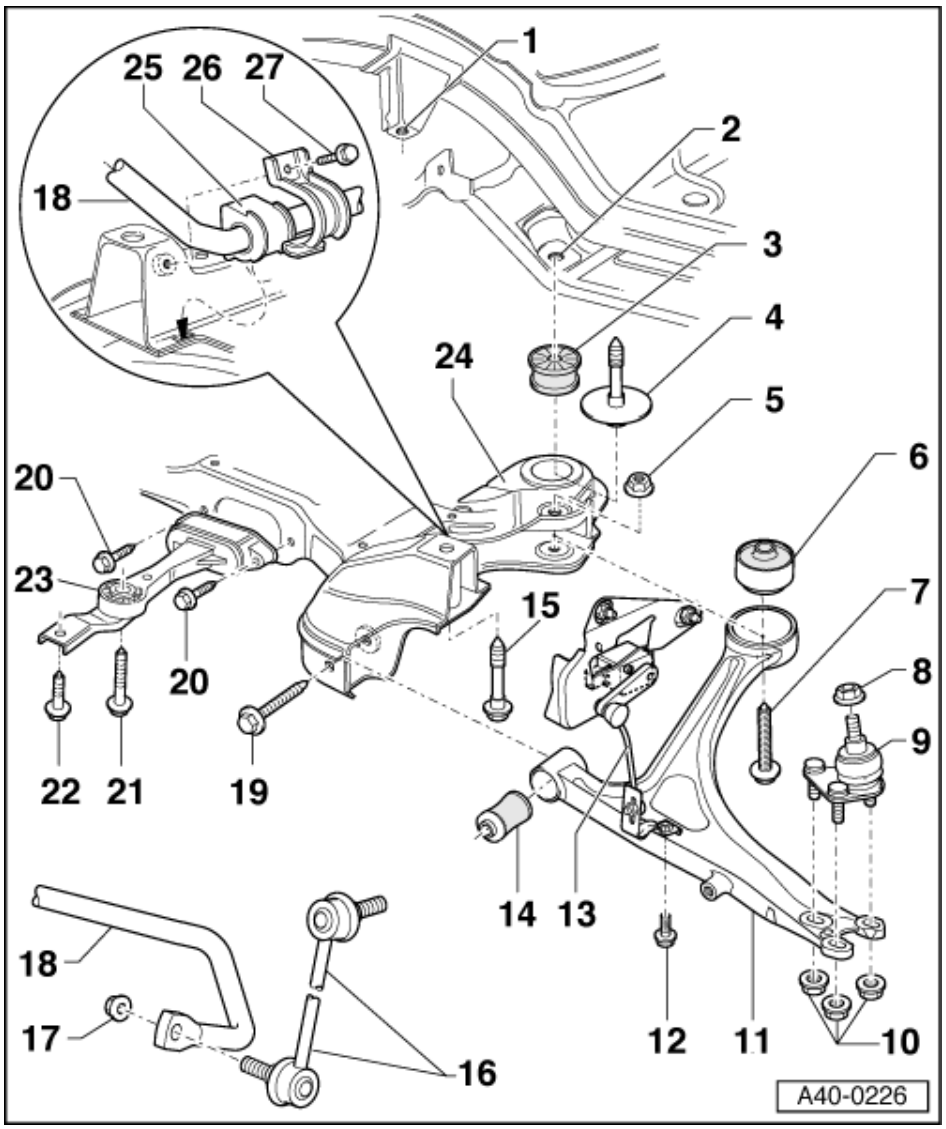
- Only to be replaced in pairs up to vehicle ident no. 8L_YA_117 500
- Replacing => Page 45

7 Bolt - 70 Nm + further 90° (1/4) turn

- Always replace together with nut -Item 5 - after removing

8 Nut, 45 Nm

- Self-locking
- Always replace after removing



9 Ball joint

- Checking =>Page 30
- Removing and installing=>Page 32
- Mark installation position; on replacing wishbone, set to centre of elongated hole and check toe/camber
- Wheel alignment => Page 273

10 Nut, 75 Nm

- Self-locking
- Always replace after removing

11 Wishbone

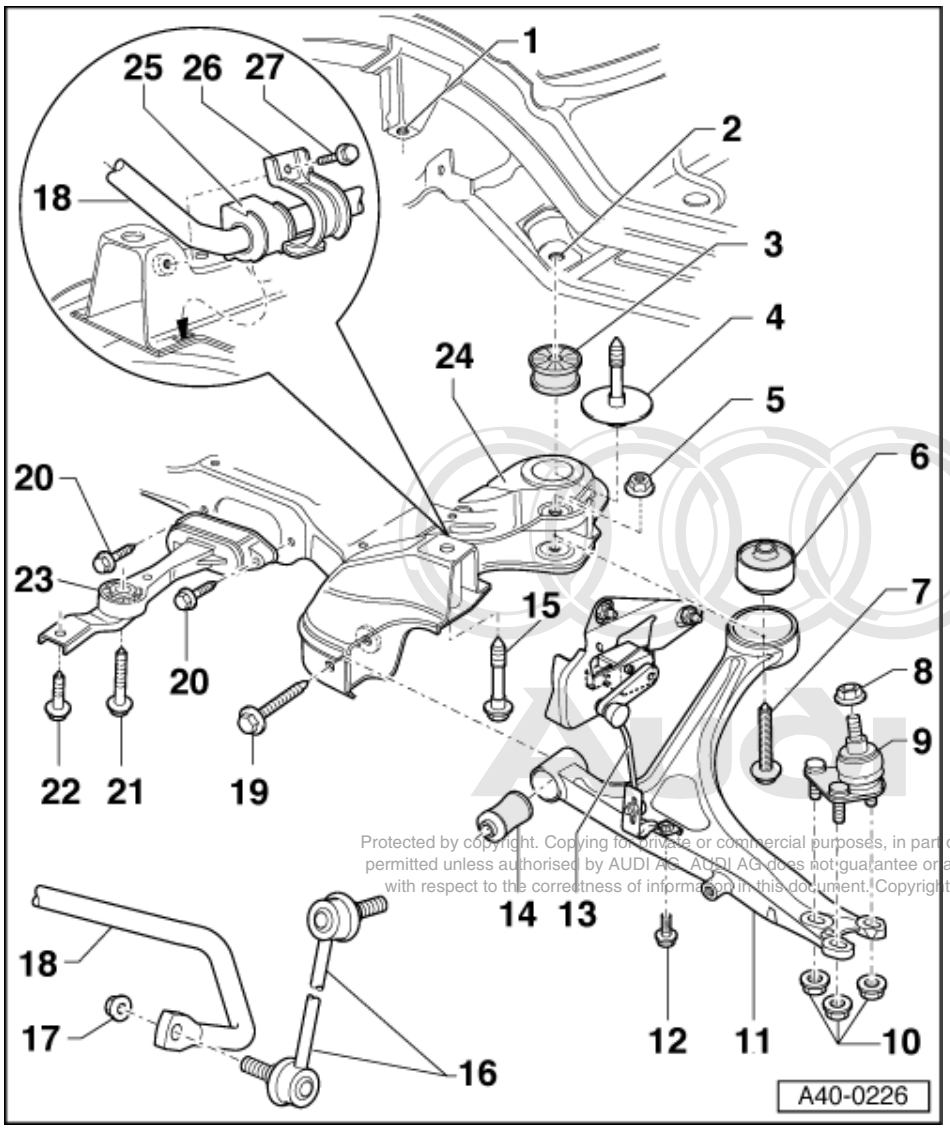
- Different versions

=> Parts List

- Only to be replaced in pairs up to vehicle ident no. 8L_YA_117 500
- Removing and installing=>Page 35

12 Bolt, 25 Nm

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13 Front left vehicle level sender -G78

14 Bonded rubber bush

- Replacing => Page 47

15 Bolt - 100 Nm + further 90° (1/4) turn

- Always replace after removing

16 Connecting link

17 Nut, 90 Nm

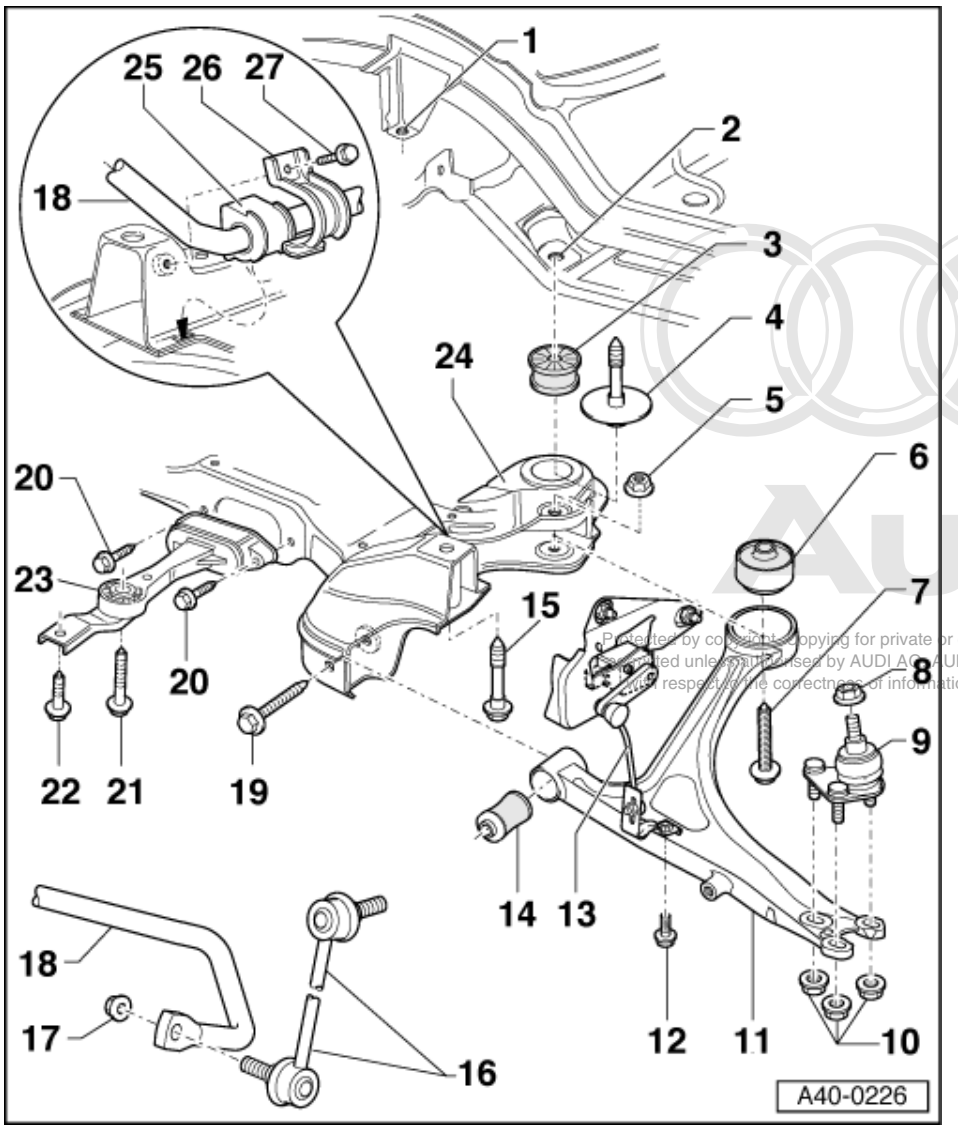
- Always replace after removing

18 Anti-roll bar

- Removing and installing=>Page 27

19 Bolt - 70 Nm + further 90° (1/4) turn

- Always replace after removing



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20 Bolt - 20 Nm + further 90° (1/4) turn

- Always replace after removing

21 Bolt - 40 Nm + further 90° (1/4) turn

- Always replace after removing

22 Bolt - 40 Nm + further 90° (1/4) turn

- Always replace after removing

23 Pendulum support

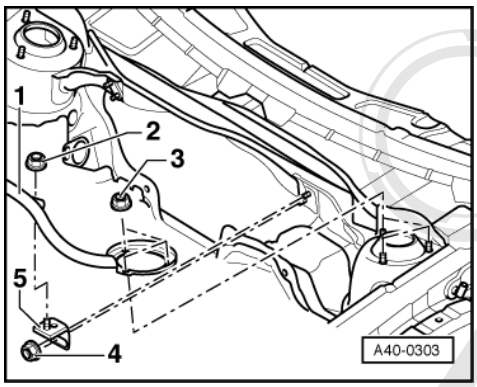
24 Subframe

- Removing and installing=>Page 53
- Installation position of cross piece => Fig. 2

25 Rubber bush

26 Clamp

27 Bolt, 25 Nm



-> Fig.1 Removing and installing brace for suspension strut dome - Audi S3

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- To remove dome brace -1-, unscrew nut -2- (1x) at bracket -5- and nuts -3- (6x) at suspension strut domes.
- Unfasten nut -4- to adjust bracket -5-.
  - Tightening torque for nuts 2...4: 20 Nm

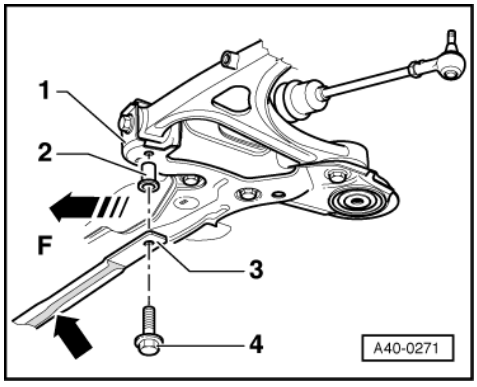


Fig.2 -> Installation position of subframe cross-piece

Cross-piece is not fitted on all vehicles.

F - Direction of travel
1 - Subframe
2 - Pop rivet nut, M10
Use V.A.G 1765 B to insert.
3 - Cross-piece
Fit with "L" or "links" on left in direction of travel.
Foam strip faces downwards -arrow-.
4 - Bolt - 30 Nm + further 90° turn
- Always replace after removing
- Apply locking fluid D 000 600 A2 when fitting

1.4 - Repairing thread in longitudinal member

Under certain circumstances it is possible to repair the thread in the welding nuts in the longitudinal member.

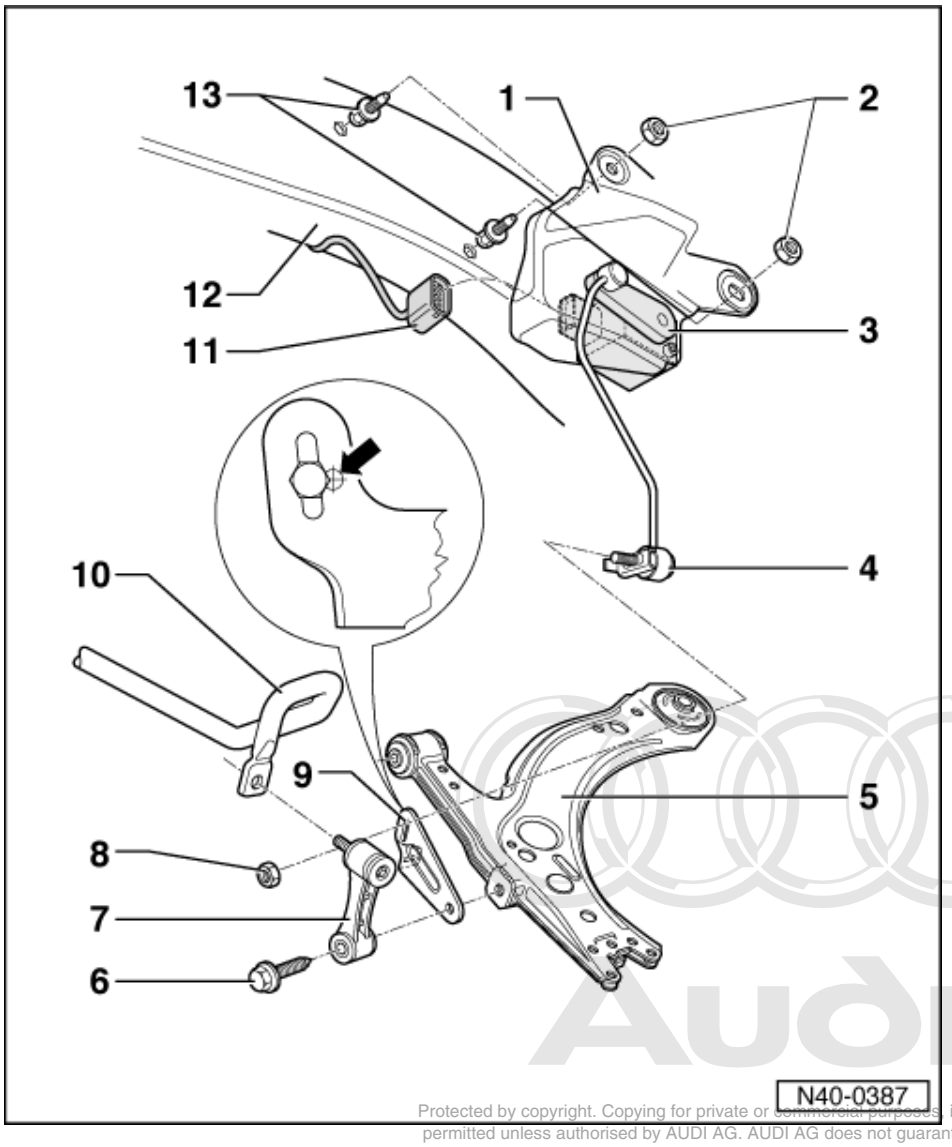
- Each thread can only be repaired once.
- Welding nut must be replaced if repairs are required for a second time.

Attention:
Always wear safety goggles when drilling.

- Have thread repair checked by foreman or immediate superior.
- Threaded insert must be of same length as thread in body.
- Rectify any damage to underseal

=> Body Repairs; Anti-corrosion measures

1.5 - Front left vehicle level sender -G78 for headlight range control - Front-wheel drive vehicles



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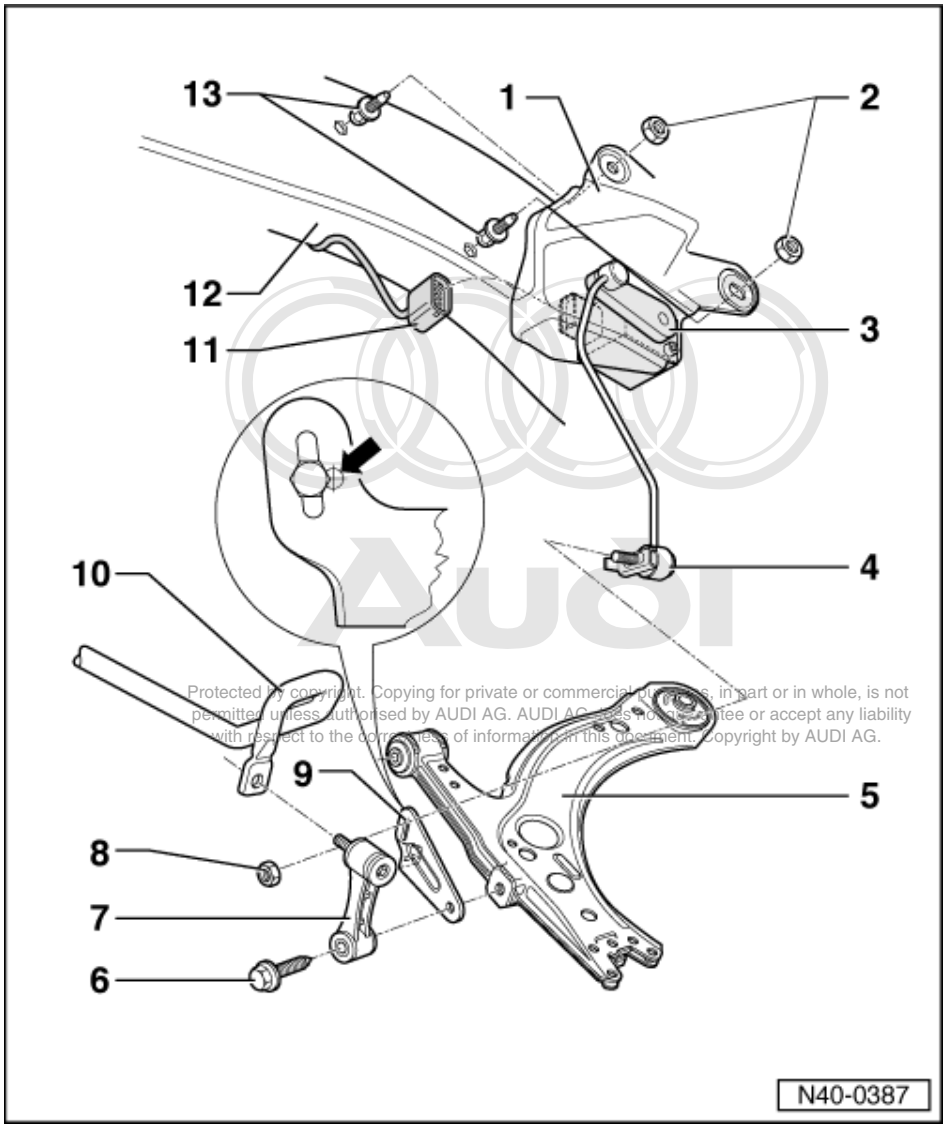
Headlight basic setting is always to be performed:

- On removing and installing wishbone
- Following vehicle level sender installation work

Headlight basic setting

=> Electrical System, Self-diagnosis; Repair Group 01

1 Bracket
2 Nut, 6 Nm
3 Front left vehicle level sender -G78



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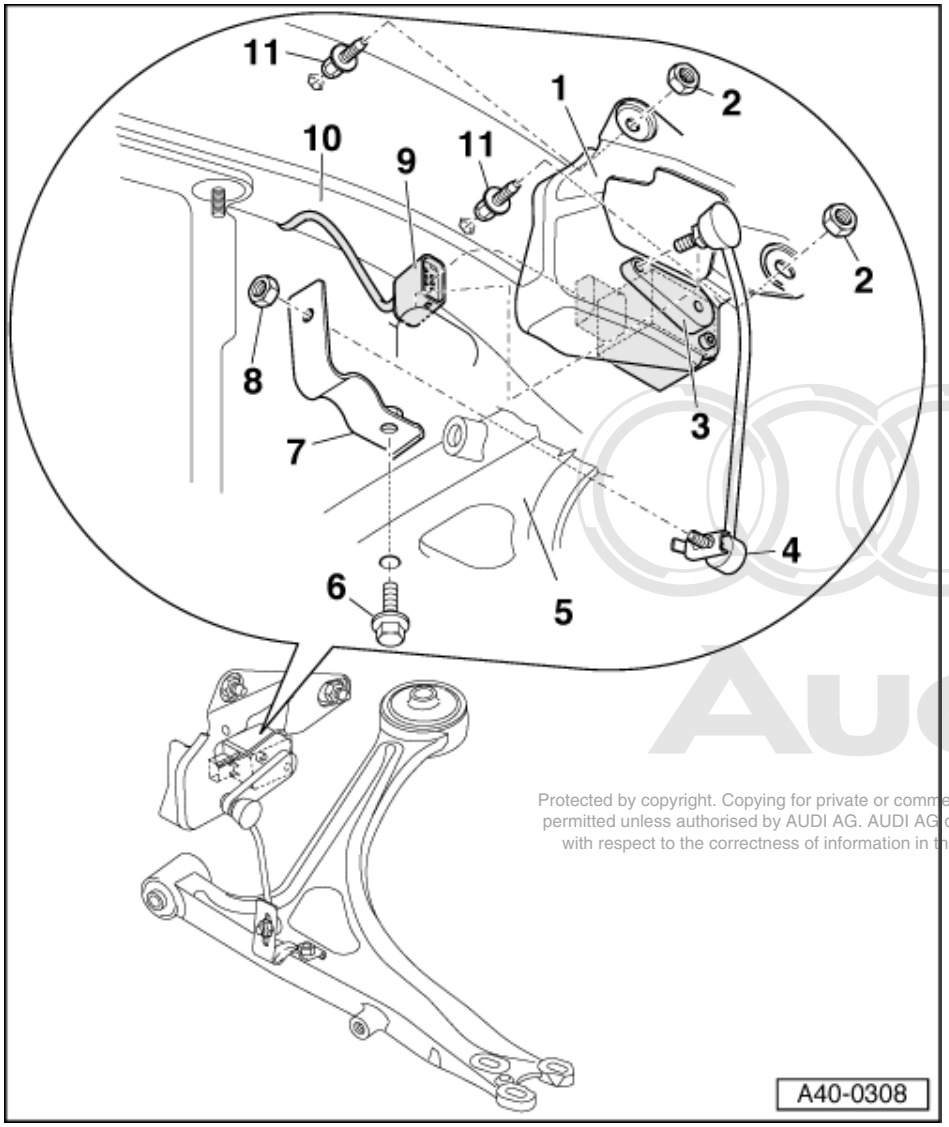
4 Connecting link
- For vehicle level sender
- On vehicles with elongated hole, screw on connecting link in area of mark -arrow- on bracket -Item 9 -

5 Wishbone
6 Bolt - 15 Nm + further 90° (1/4)turn
- Always replace after removing

7 Connecting link
8 Nut, 6 Nm
9 Bracket
10 Anti-roll bar
11 Connector
12 Front longitudinal member
13 Pop rivet bolts

- Fit using special tool V.A.G 1765 B

1.6 - Front left vehicle level sender -G78 for headlight range control - Four-wheel drive vehicles



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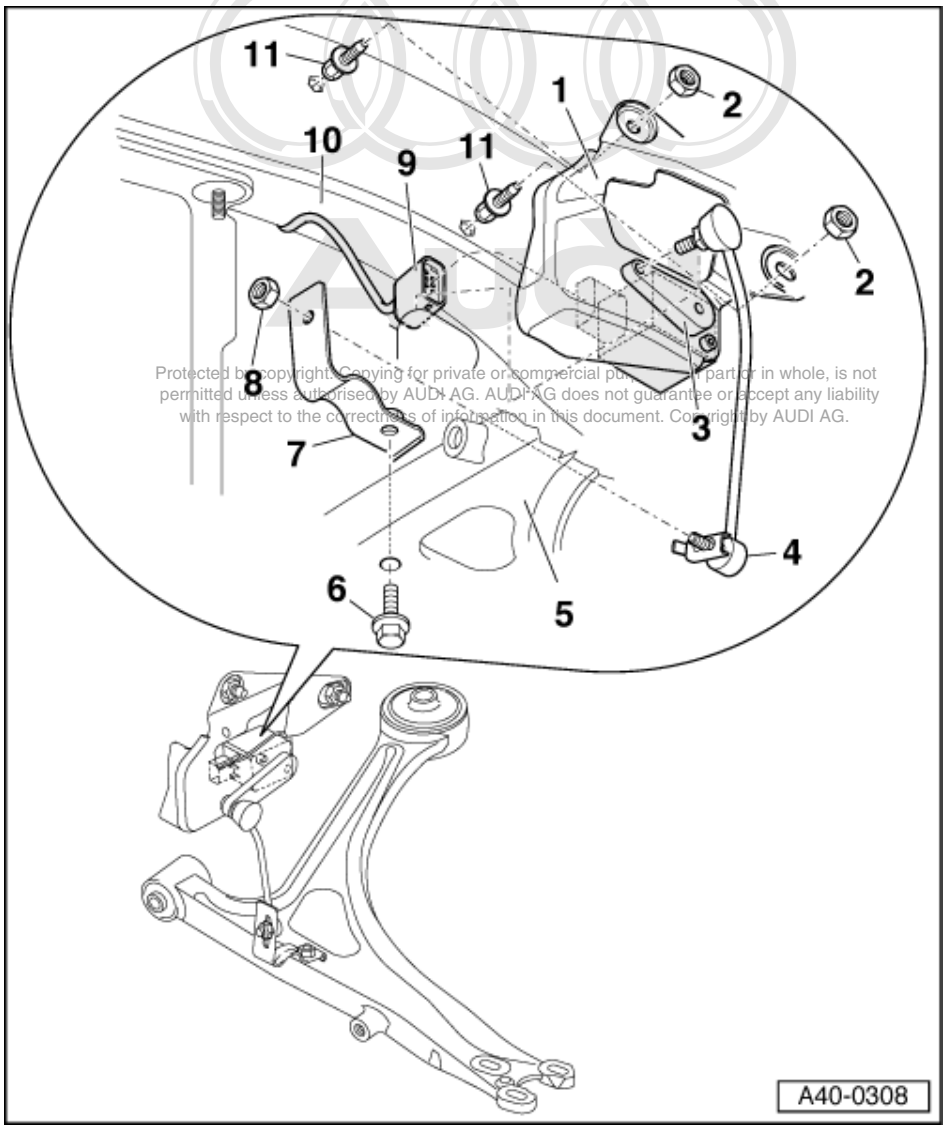
Headlight basic setting is always to be performed:

- On removing and installing wishbone
- Following vehicle level sender installation work

Headlight basic setting

=> Electrical System, Self-diagnosis; Repair Group 01

1 Bracket
2 Nut, 8 Nm



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3 Front left vehicle level sender -G78

4 Connecting link

- For vehicle level sender

5 Wishbone

6 Bolt, 25 Nm

7 Bracket

- Adjustment dimension for bracket with elongated hole => Fig. 1

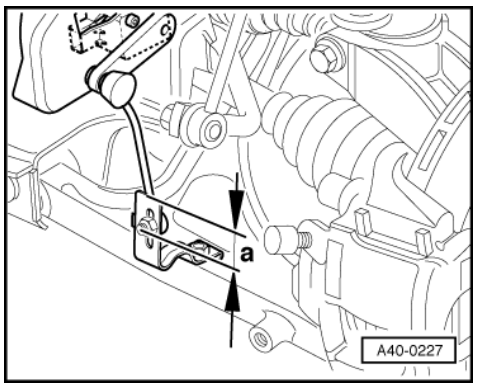
8 Nut, 4 Nm

9 Connector

10 Longitudinal member

11 Pop rivet bolt

- Fit using special tool V.A.G 1765 B

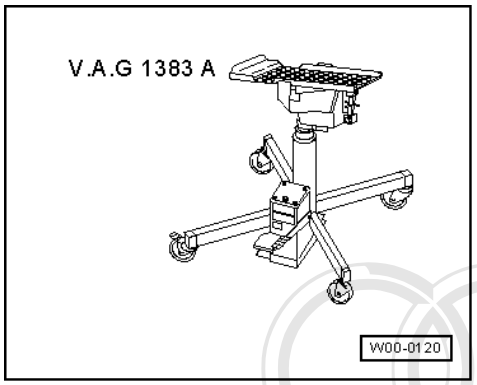


-> Fig.1 Adjusment dimension for headlight range control linkage for bracket with elongated hole

Dimension a = 19 mm

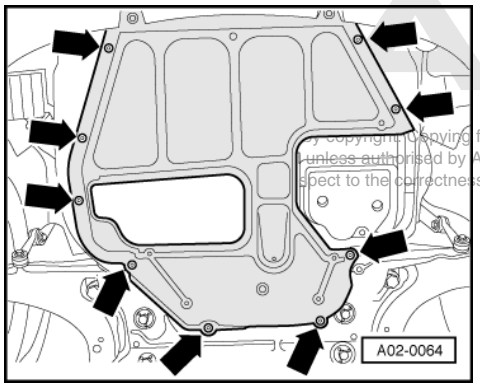
- Tighten nuts to 4 Nm.

1.7 - Removing and installing anti-roll bar



Special tools and workshop equipment required

- Engine/gearbox lifter V.A.G 1383 A

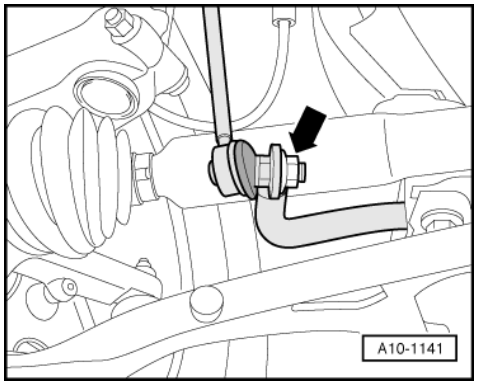


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Removing

- Unscrew both front wheels.
- -> If necessary, remove centre noise insulation -arrows-.
- Unfasten noise insulation on left and right side at subframe.

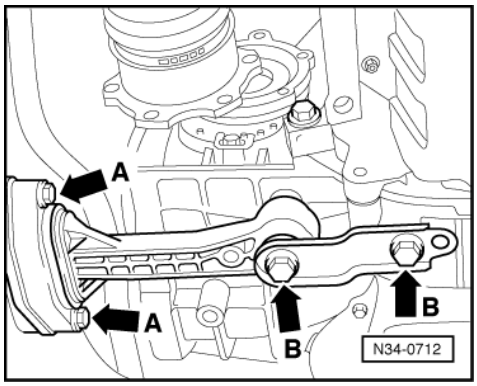
- Unfasten headlight range control unit at wishbone on left
  =>Page 25 .



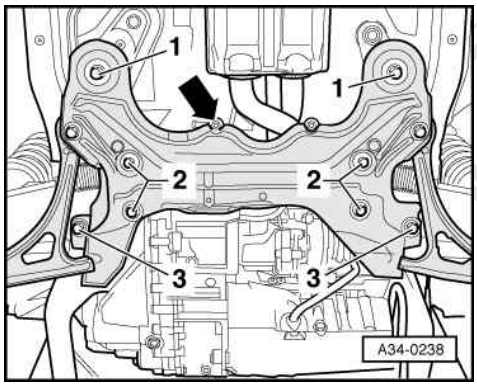
- -> Unscrew connecting links on left and right of anti-roll bar -arrow-.

Note:

Fig. shows four-wheel drive vehicle.

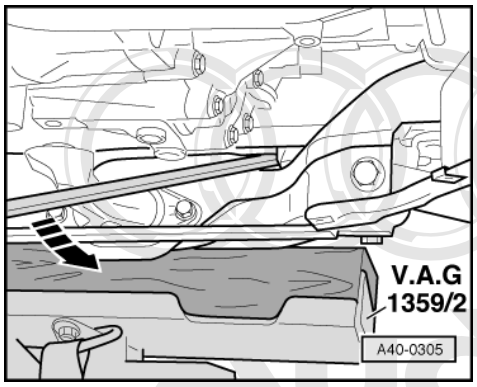


- -> First screw out bolts -A-, then bolts -B- of pendulum support.
- Detach pendulum support.



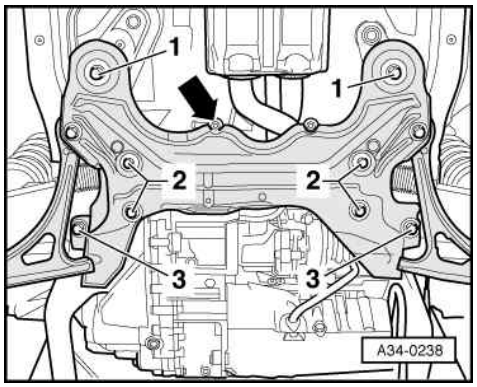
- -> If fitted, disengage rubber mount at front exhaust pipe -arrow-.
- Screw out bolts -2- for steering box.

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- -> Prise steering box off subframe (dowel sleeve) -arrow-.
- Unscrew holder for power steering pressure pipe on left of subframe.
- Position engine/gearbox lifter V.A.G 1383 A with universal mount V.A.G 1359/2 and wooden block beneath subframe.

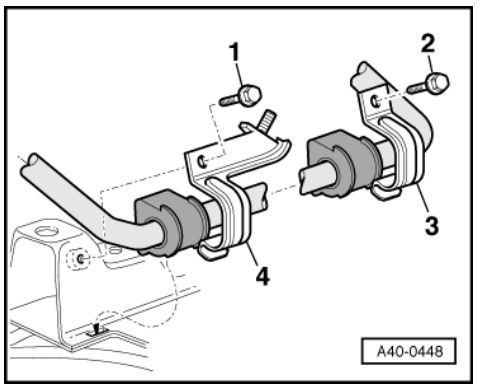
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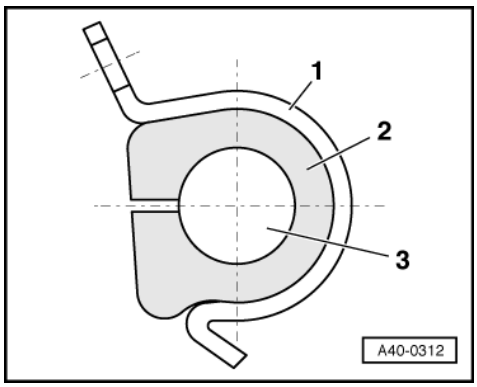
- -> Screw out bolts -1- and -3- for subframe.
- Carefully lower subframe.

Note:

When lowering, pay attention to side noise insulation and holder for hydraulic pipes on left side.



- -> Screw out bolts -1- and -2- at anti-roll bar clamps.
- Disengage clamps -3- and -4- at subframe and detach anti-roll bar to rear.



Installing

Install in reverse order, paying attention to the following:

- -> Install anti-roll bar as shown.

  1 - Clamp
  2 - Rubber bush
  3 - Anti-roll bar

- Check correct positioning of sealing collar at steering box pinion.
- Install subframe => Page 52 .

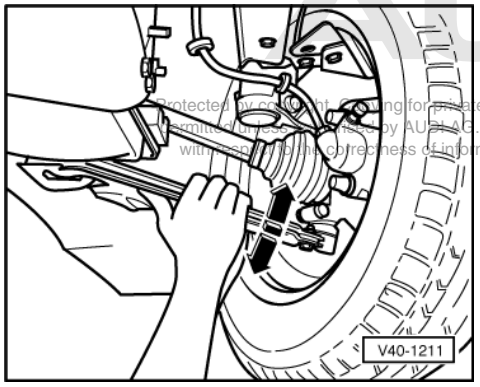
Tightening torques

Component		Nm
Connecting link	FWD	15 + 90° 1)2)
to anti-roll bar	4WD	90 2)
Anti-roll bar clamp to subframe		25
Holder for power steering pressure pipe to subframe		23

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

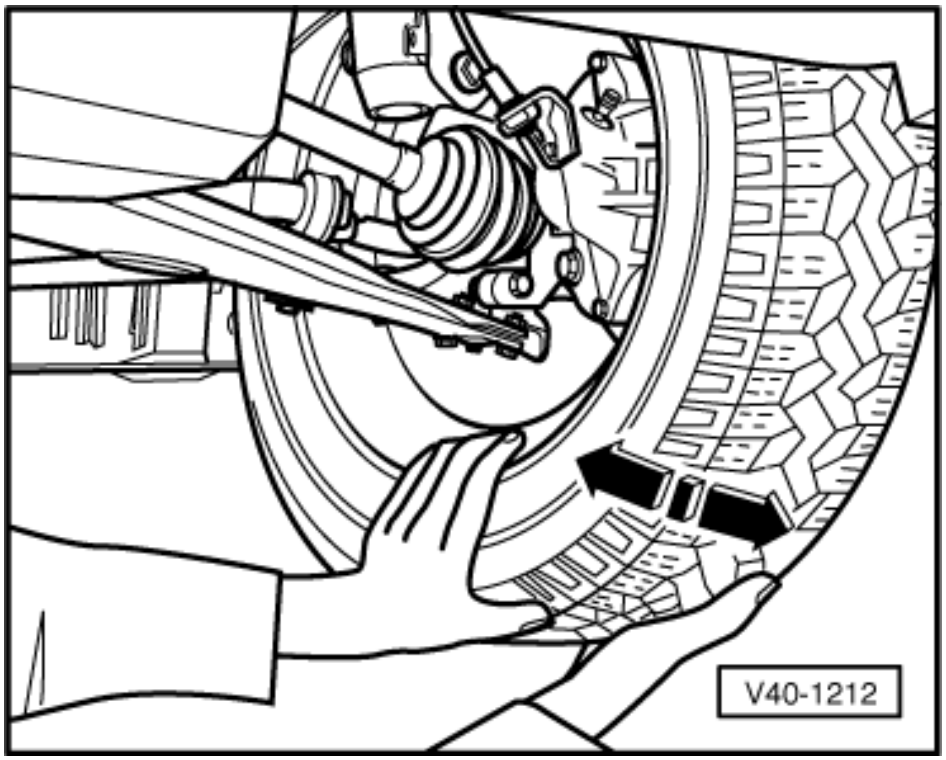
1.8 - Checking ball joint



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Checking axial clearance

- -> Pull wishbone firmly downwards and press up again.



Checking radial clearance

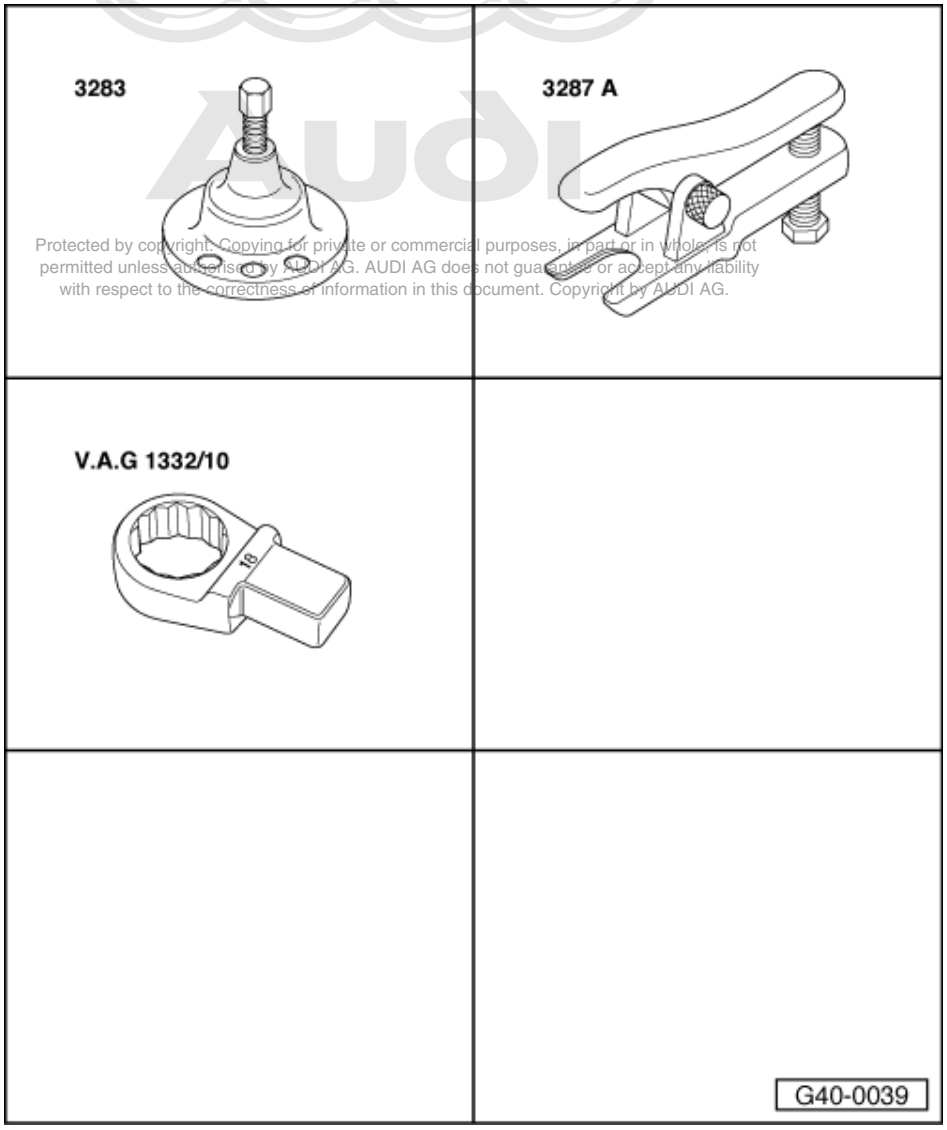
- -> Press bottom of wheel firmly inwards and outwards.

Notes:

- Observe ball joint during checking.
- Neither check should reveal any palpable or visible "play".
- Make allowance for any wheel bearing clearance or "play" in upper suspension strut mounting.
- Check rubber bellows for damage; replace ball joint if necessary.

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1.9 - Removing and installing ball joint

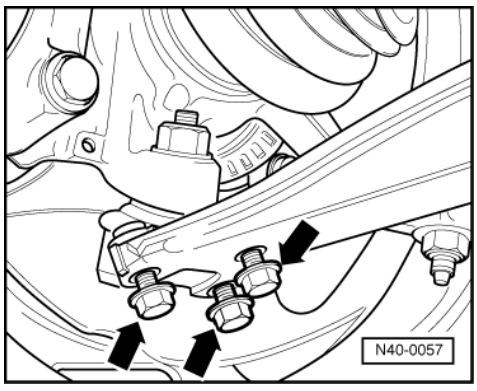


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Special tools and workshop equipment required

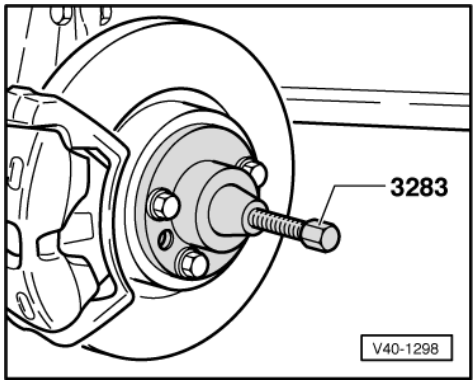
- Pressing-out tool 3283
- Ball joint puller 3287 A
- Ring spanner V.A.G 1332/10

Removing



Audi A3:

- Unfasten twelve-point nut of drive shaft; procedure =>Page 108 .
- Remove wheel.
- -> Screw out bolts -arrows- at ball joint.



- -> Apply pressing-out tool 3283 and press drive shaft out of wheel bearing housing.

Note:

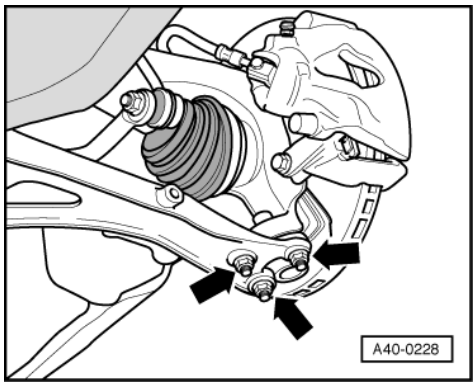
Ensure adequate clearance when pressing out drive shaft.

- Use wire to tie drive shaft to body.

Note:

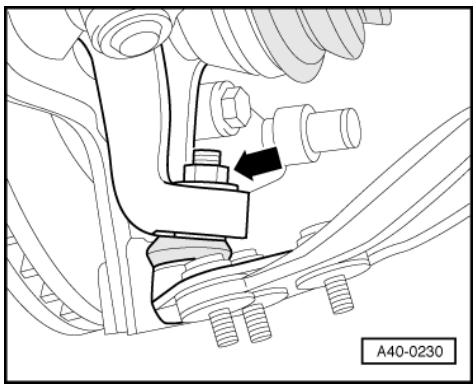
Failure to tie drive shaft in position would damage inner joint.

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Audi S3:

- Remove wheel.
- -> Unscrew nuts -arrows- at ball joint.

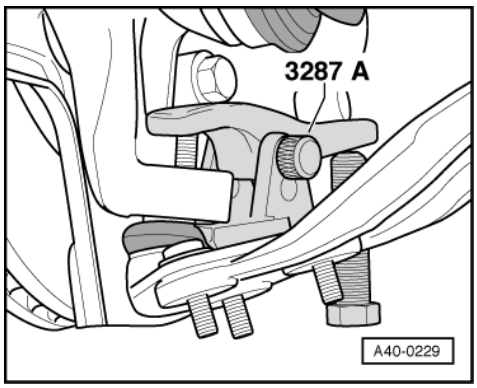


Audi A3:

- Pull wheel bearing housing with ball joint out of wishbone.

All models:

- -> Unscrew nut -arrow-.



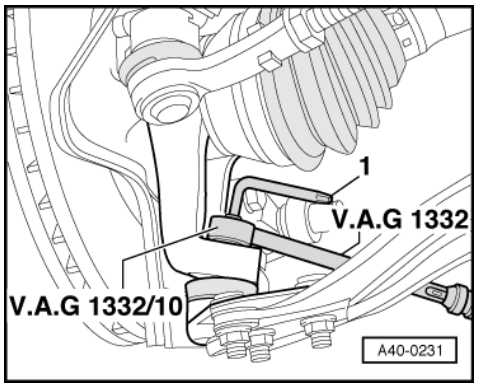
- -> Apply ball joint puller 3287 A to ball joint as shown.

Note:

Leave nut screwed several turns onto ball joint to protect thread.

- Press ball joint out of wheel bearing housing.

Attention:
On pressing out, ball joint is abruptly released from wheel bearing housing and can be a source of danger.



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Installing

Install in reverse order, paying attention to the following:

- -> Screw on new self-locking nut whilst providing support with torx socket T40 -Item 1-.

Note:

Use can also be made instead of V.A.G 1332/10 of commercially available 18 mm ring spanners.

Audi A3:

- Insert drive shaft in wheel hub splines.

All models:

- Insert ball joint in wishbone and align bolted joint in elongated holes.

Audi A3:

- Secure drive shaft.
  - Procedure for tightening twelve-point nut => Page 108

Tightening torques

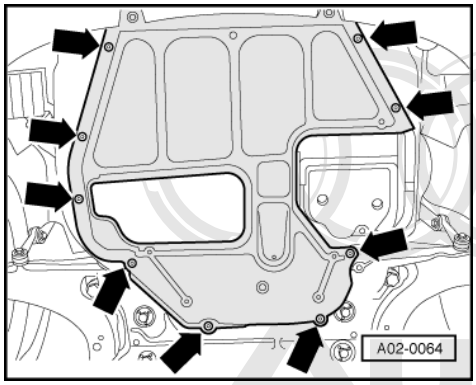
Component		Nm
Ball joint to wishbone	Bolts M8	20 + 90° 1)2)
	Nuts M10	75 2)
Ball joint to wheel bearing housing		45 2)

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

Perform wheel alignment after installation.

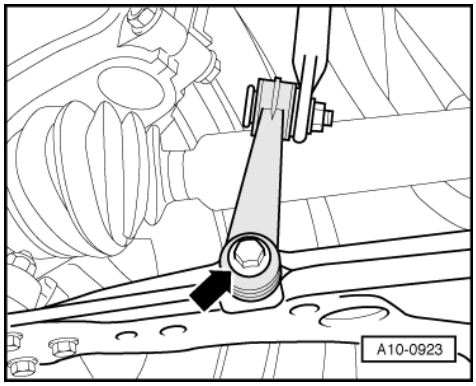
1.10 - Removing and installing front wishbone



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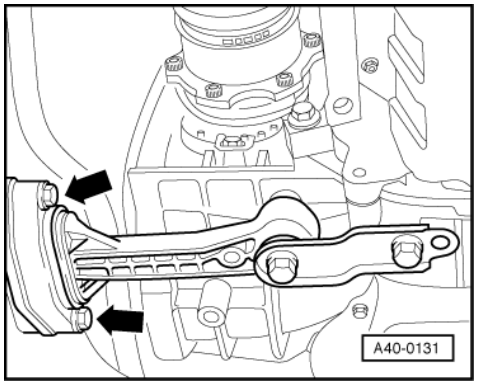
Removing

- Remove wheel.
- -> If necessary, remove centre noise insulation -arrows-.
- Unfasten headlight range control unit at wishbone on left =>Page 25 .



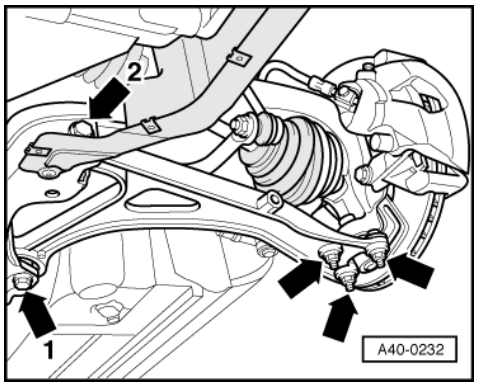
Front-wheel drive vehicles:

- -> Unscrew connecting link from wishbone -arrow-.



Vehicles with automatic gearbox:

- -> Screw out bolts -arrows-.

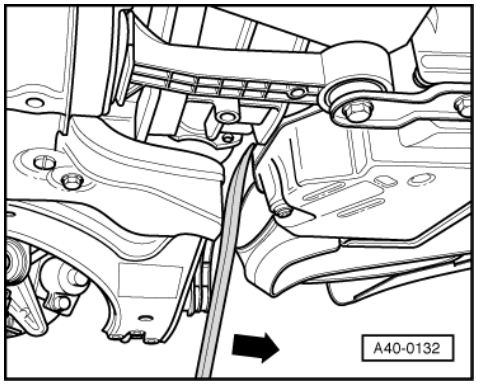


All models:

- -> Unfasten wishbone/ball joint connection at lower bolted joint -arrows-.
- Screw out hexagon bolts -1- and -2- and take out wishbone.

Note:

Bolt -1- is secured from above with a nut.



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Vehicles with automatic gearbox:

- -> To take out wishbone, use tyre iron to press engine/gearbox assembly in direction of travel -arrow-.

Installing

Install in reverse order.

Tightening torques

Component		Nm
Ball joint to wishbone	Bolts M8	20 + 90° 1)2)
	Nuts M10	75 2)
Wishbone to subframe		70 + 90° 1)2)
Pendulum support to subframe		20 + 90°1)2)
Connecting link to wishbone (FWD)		15 + 90° 1)2)

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

Perform wheel alignment after installation.

1.11 - Replacing wishbone bonded rubber bushes

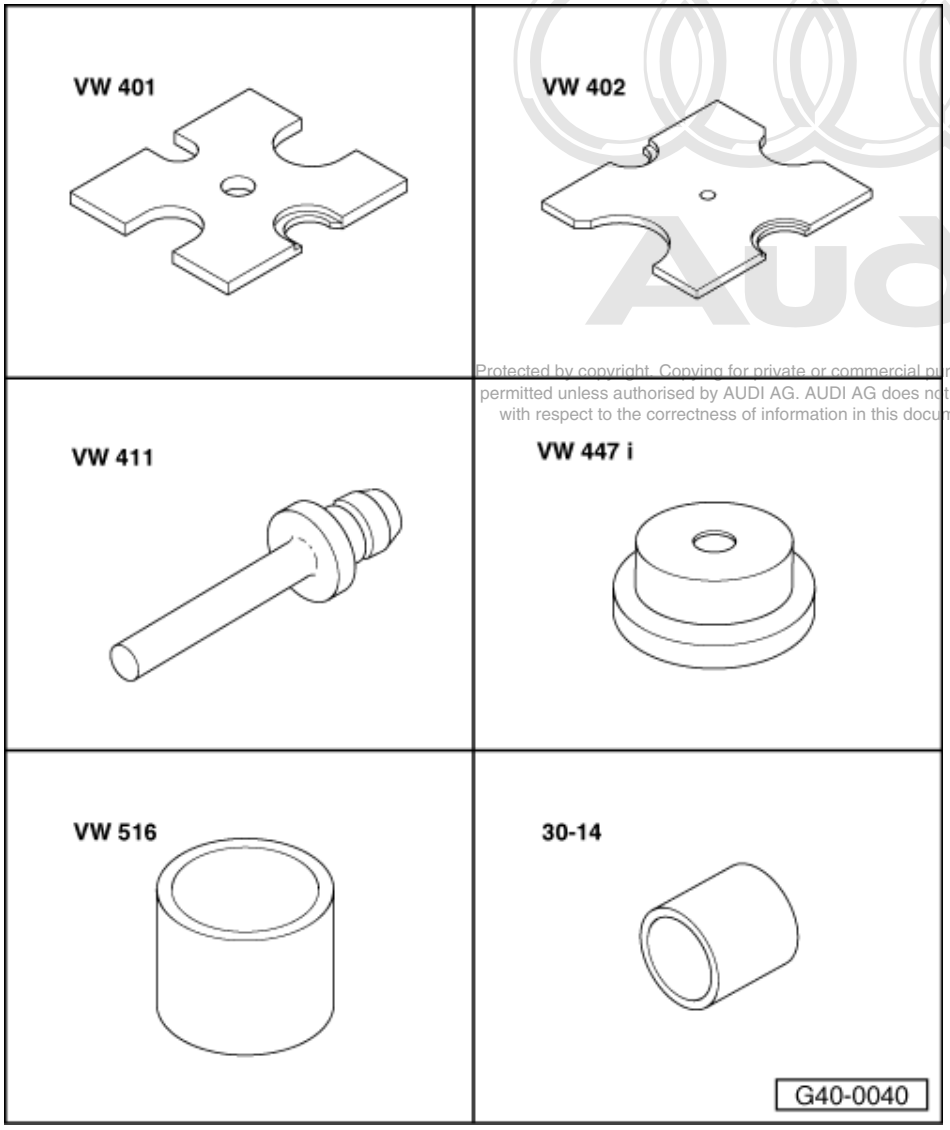
Bonded rubber bushes can only be turned to a limited extent. The bolted joints at the suspension links are therefore not to be tightened until the vehicle is standing on the ground.

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General

- Never apply grease to bonded rubber bushes as this could impair functioning.
- When pressing in bonded rubber bushes, use assembly lubricant G 294 421 A1 diluted with water in a ratio of 1 : 9.
- Assembly lubricant G 294 421 A1 is not acidic and quickly penetrates (diffuses) into the rubber, leaving behind a slightly tacky film which guarantees the firm fit of the bush.
- Conventional greases/oils usually contain acid and produce a lubricant film. This could lead to corrosion of the rubber or cause the whole bush to turn in the mount, rather than just the rubber, on extension and compression of the vehicle suspension.

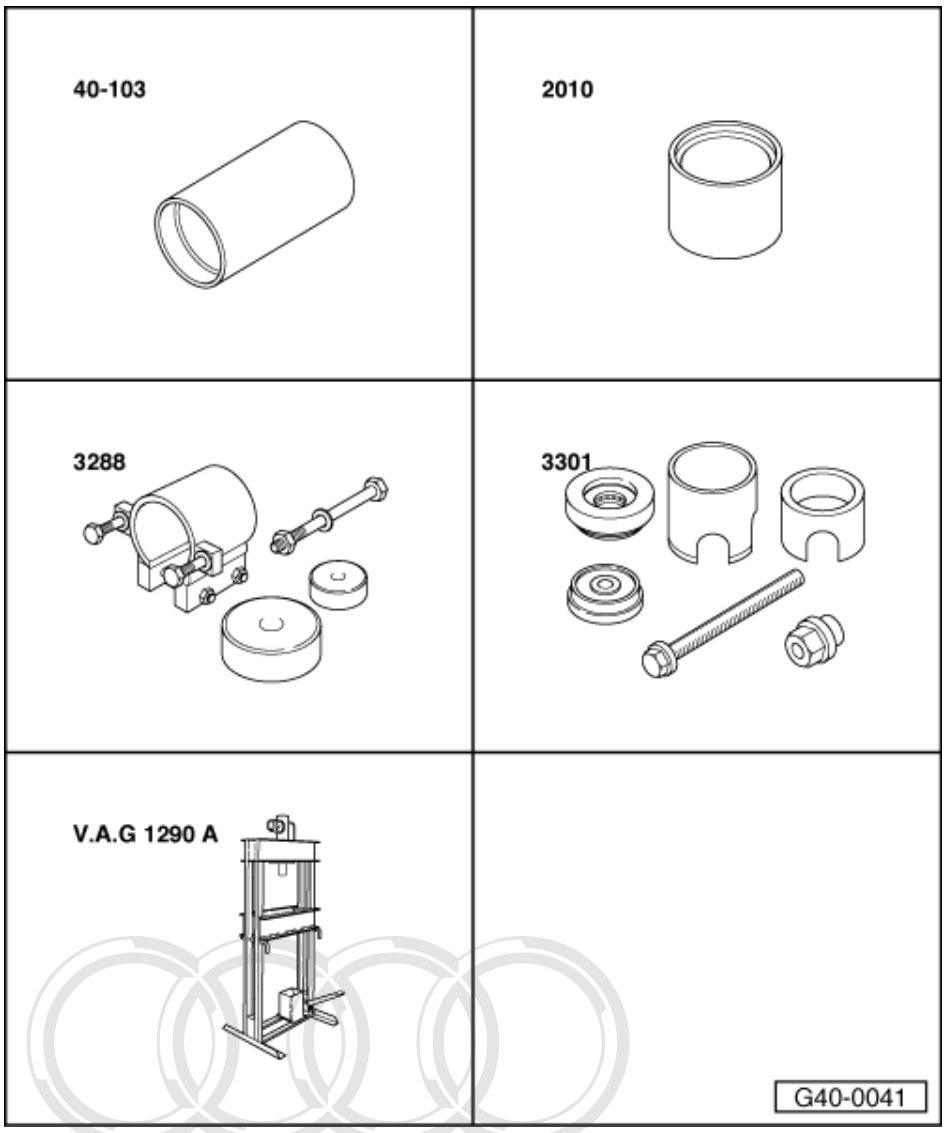
1.12 - Replacing wishbone bonded rubber bushes - Audi A3



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Special tools and workshop equipment required

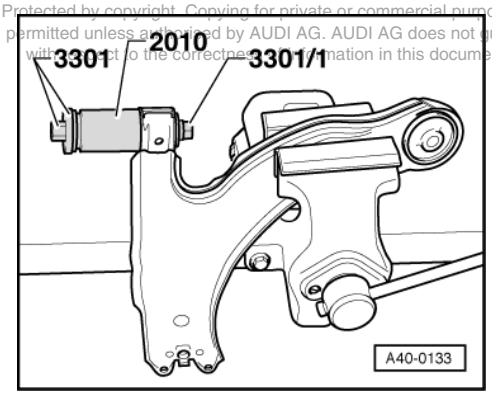
- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 411
- Thrust pad VW 447 i
- Tubular section VW 516
- Pressing-off tube 30-14



- Base 40-103
- Tubular section 2010
- Sleeve 3288/2 from assembly device 3288
- Assembly device 3301
- Workshop press V.A.G 1290 A

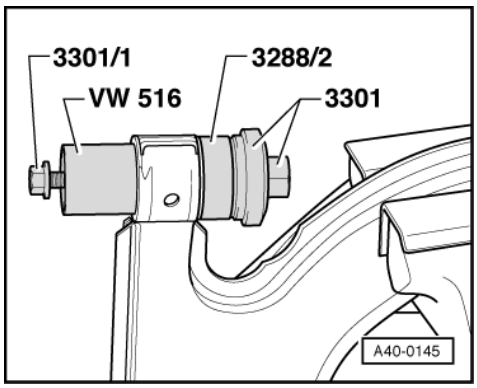
- Remove front wishbone => Page 35 .

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Extracting front bonded rubber bush

- -> Apply special tools shown and extract bush by turning spindle.

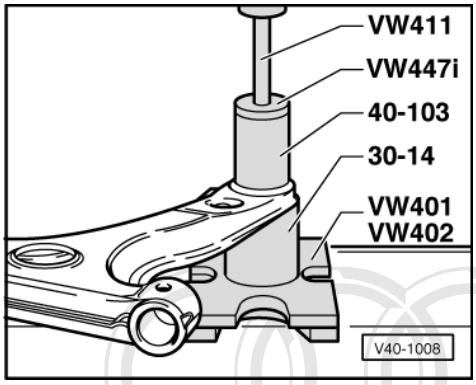


Fitting front bonded rubber bush

Notes:

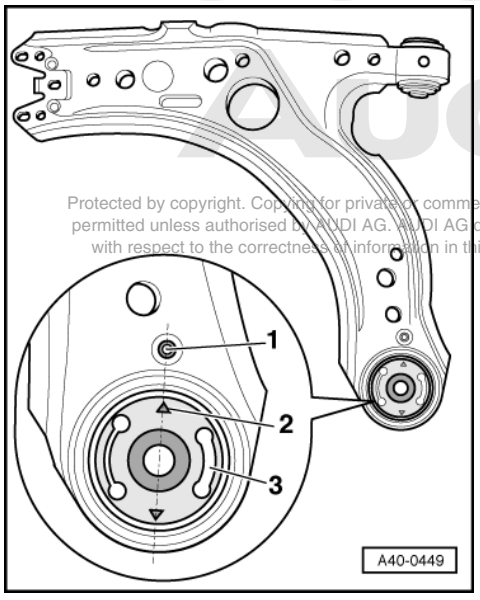
- Press in using acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.

- -> Apply special tools shown and fit bush by turning spindle.



Pressing out rear bonded rubber bush

- -> Apply special tools shown and press out bush using workshop press V.A.G 1290 A.



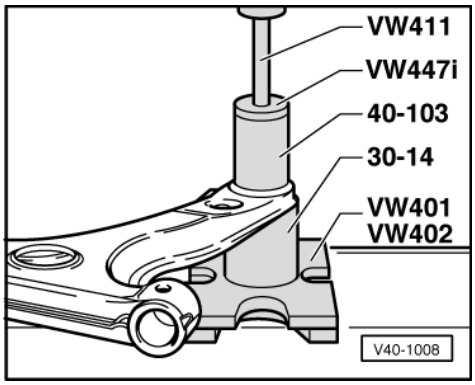
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Pressing in rear bonded rubber bush

Notes:

- Press in using acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.

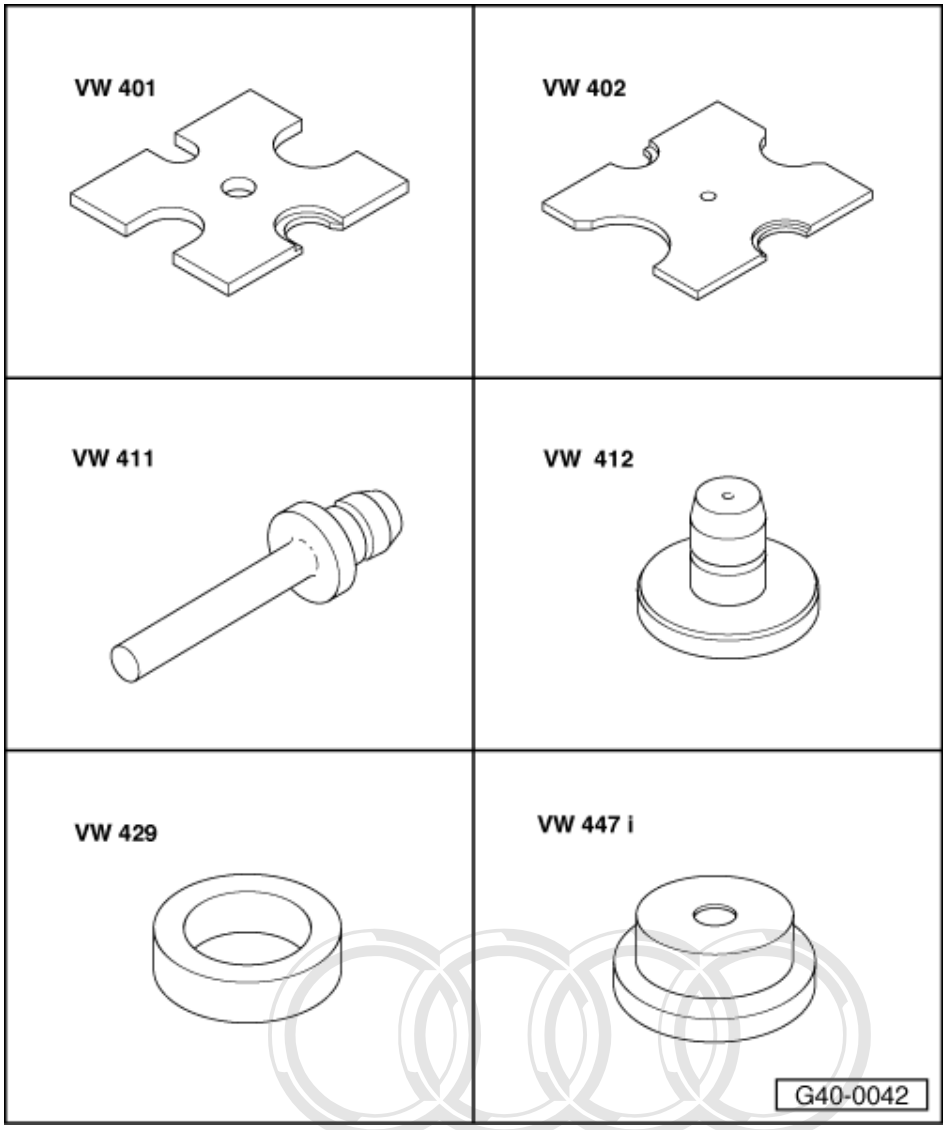
- -> Insert bonded rubber bush in wishbone as shown.
  - Arrow -2- on bush must be opposite indentation -1- at wishbone.
  - The kidney-shaped recess -3- must face centre of vehicle.



- -> Apply special tools shown and press in bush using workshop press V.A.G 1290 A.

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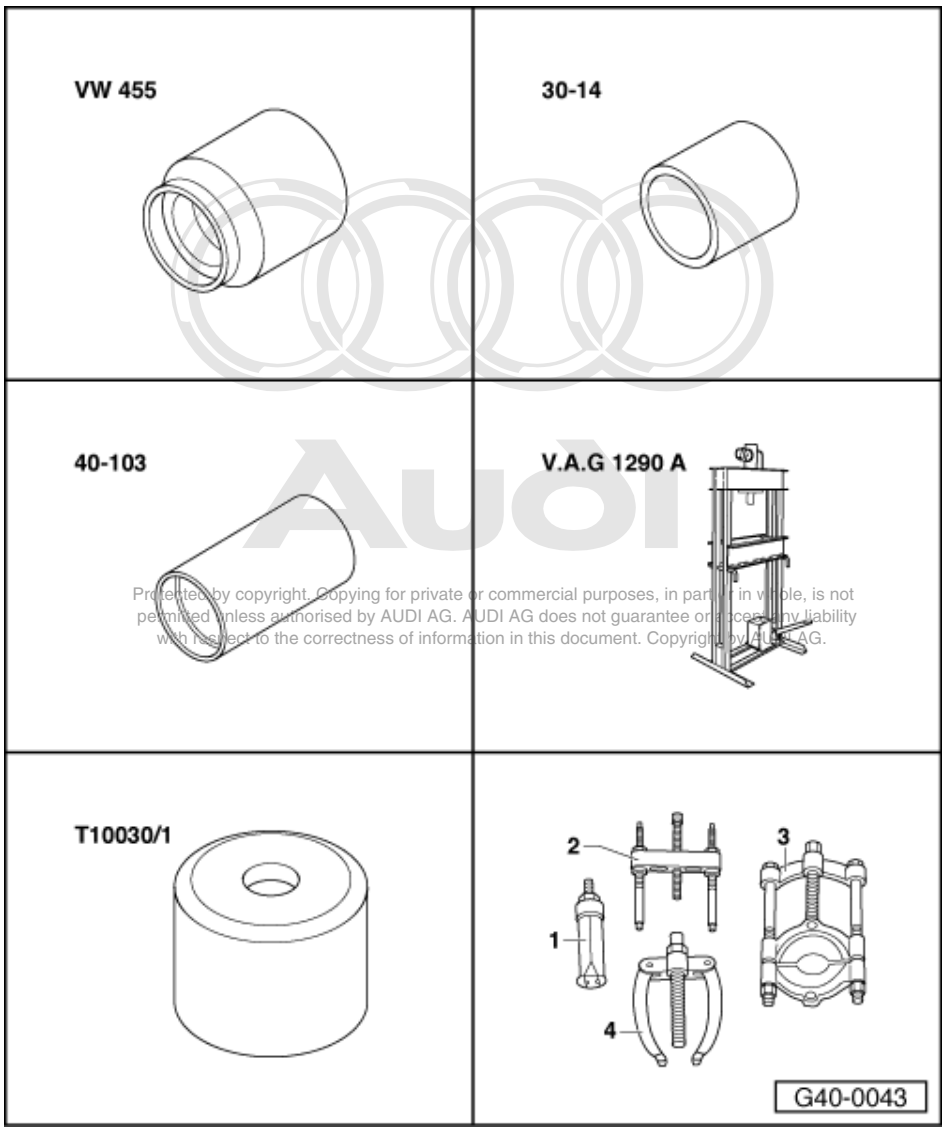
1.13 - Replacing wishbone bonded rubber bushes - Audi S3 with solid bush



Special tools and workshop equipment required

- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 411
- Press tool VW 412
- Thrust ring VW 429
- Thrust pad VW 447 i

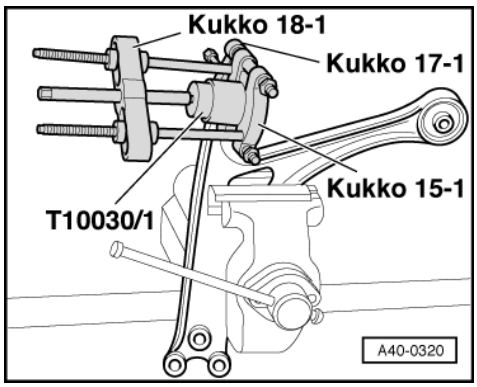
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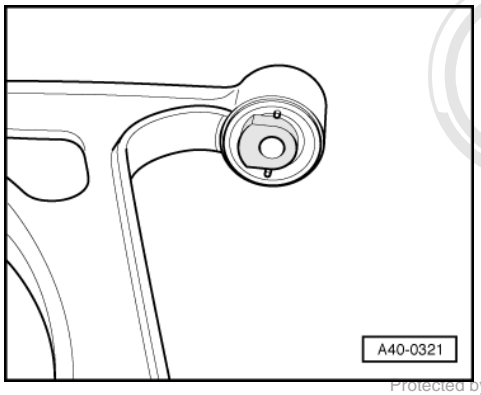
- Pressing-on sleeve VW 455
- Pressing-off tube 30-14
- Base 40-103
- Workshop press V.A.G 1290 A
- Sleeve T10030/1
- 2 - Kukko 18/1 puller
- 3 - Kukko 15/1 and 17/1 parting tools

- Remove front wishbone => Page 35 .



Pressing out wishbone front bush

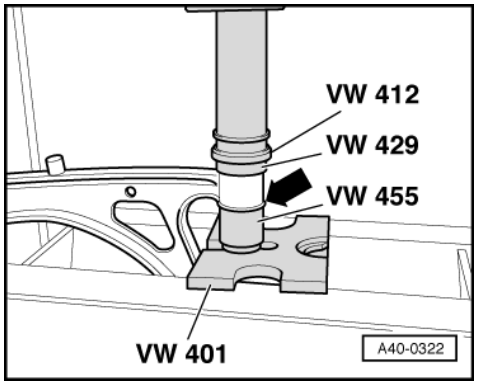
- -> Apply special tools shown and extract bush by turning spindle.



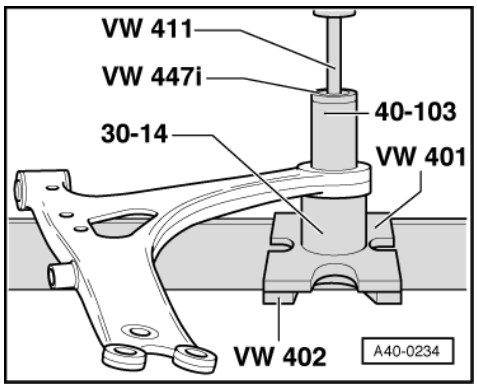
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Pressing in wishbone front bush

-> Heed installation position of bush



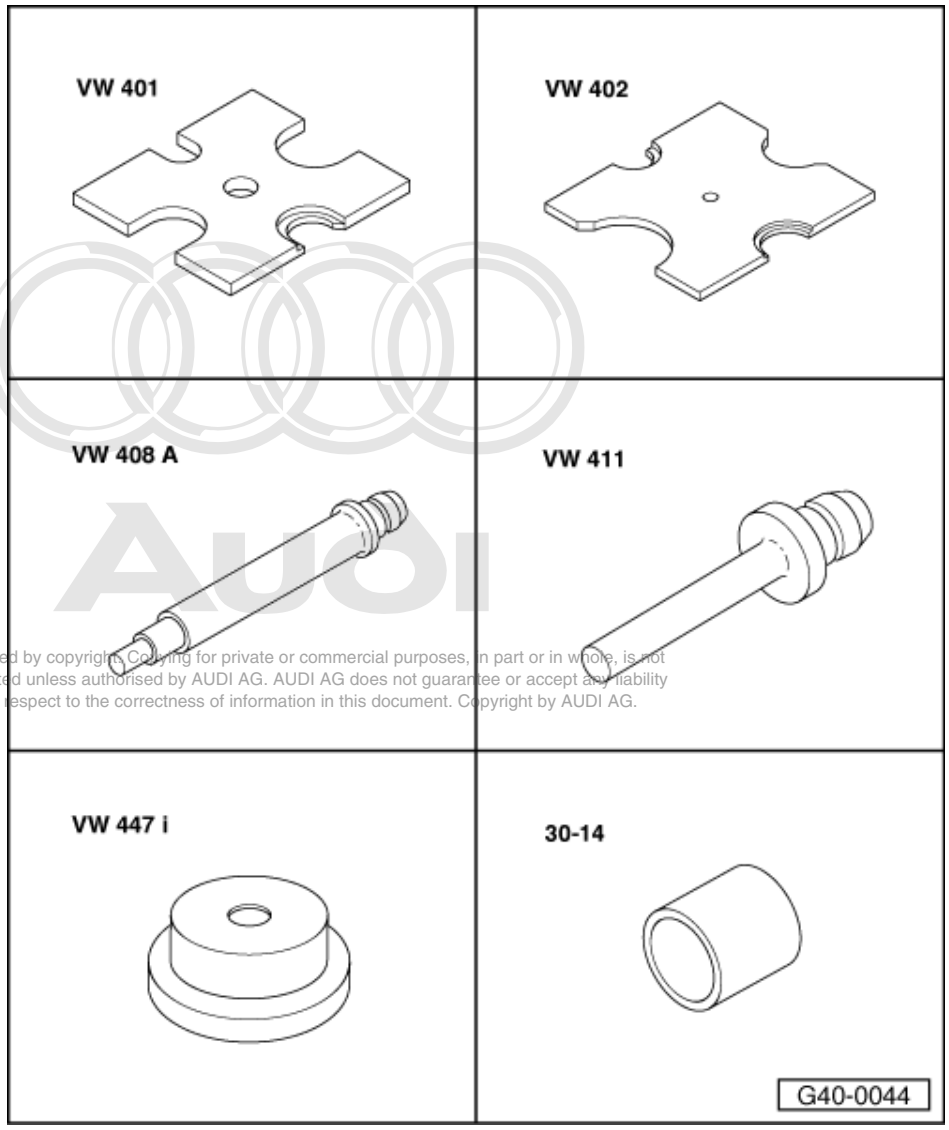
- -> Apply special tools shown and press in bush -arrow- using workshop press V.A.G 1290 A.



Pressing out/pressing in wishbone rear bush

- -> Apply special tools shown and press out/press in bush using workshop press V.A.G 1290 A.

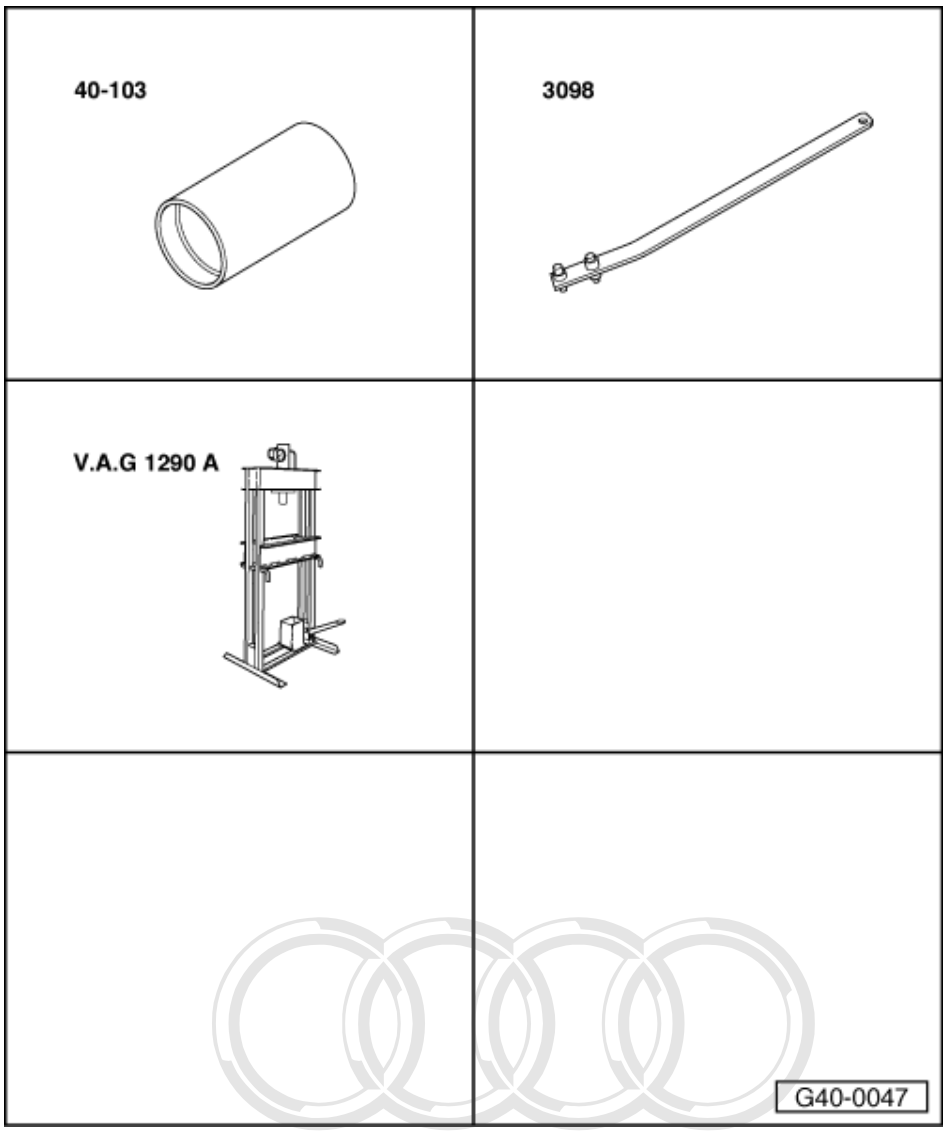
1.14 - Replacing wishbone bonded rubber bushes - Audi S3 with recessed bush



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Special tools and workshop equipment required

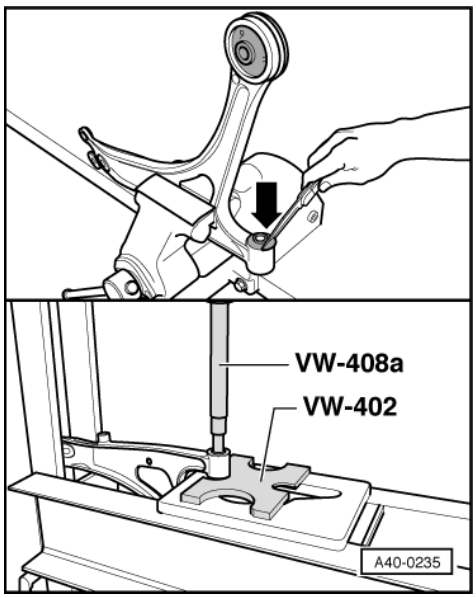
- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 408 A
- Press tool VW 411
- Thrust pad VW 447 i
- Pressing-off tube 30-14



- Base 40-103
- Special tool 3098
- Workshop press V.A.G 1290 A

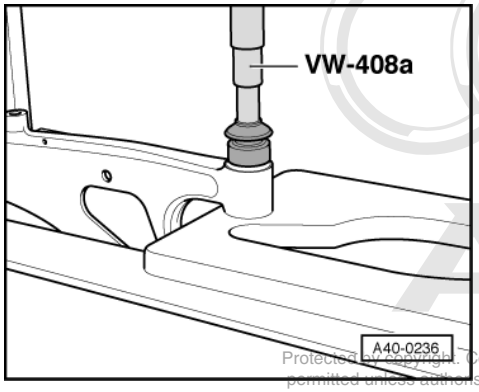
- Remove front wishbone => Page 35 .

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Pressing out wishbone front bush

- Cut off outer rubber bead of bush to create a resting surface.
- Rest this surface of wishbone on plate - VW 402 -.
- -> Press out bush using workshop press V.A.G 1290 A.



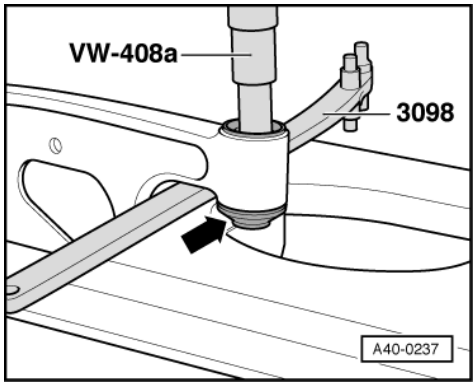
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Pressing in wishbone front bush

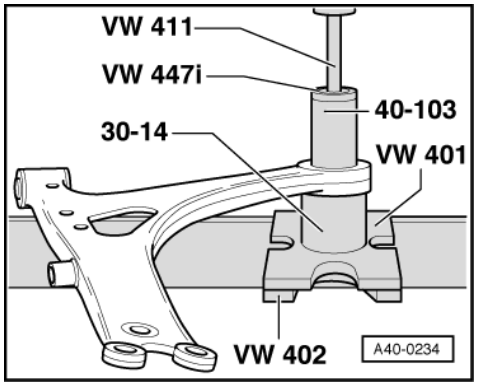
Notes:

- Press in using acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.

- Place wishbone eye on a flat surface.
- -> Start by pressing in bush with workshop press V.A.G 1290 A as far as stop.

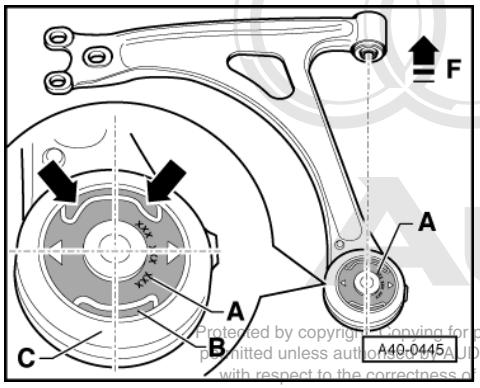


- -> Press bush further until rubber bead on underside is completely visible -arrow-.



Pressing out wishbone rear bush

- -> Apply special tools shown and press out bush using workshop press V.A.G 1290 A.

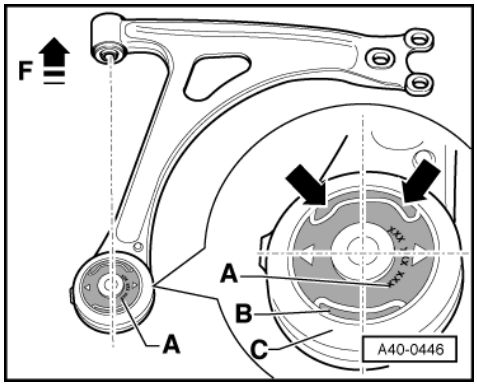


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Installation position of rear bush in left wishbone

A - -> Part number
B - "Kidney-shaped recess", larger kidney-shaped recess faces forwards in direction of travel
C - Machined surface; press in bush flush with this surface
F - Direction of travel

- Heed differences in shape of recesses -arrows-.

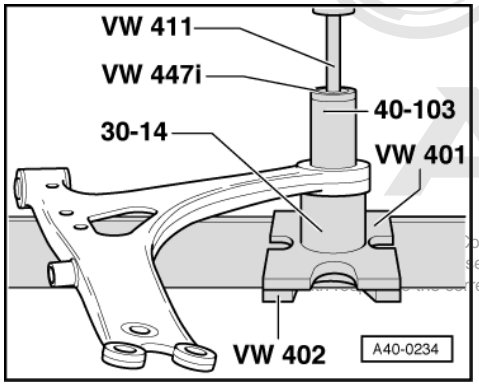


Installation position of rear bush in right wishbone

A - -> Part number
B - "Kidney-shaped recess", larger kidney-shaped recess faces forwards in direction of travel
C - Machined surface; press in bush flush with this surface

F - Direction of travel

- Heed differences in shape of recesses -arrows-.



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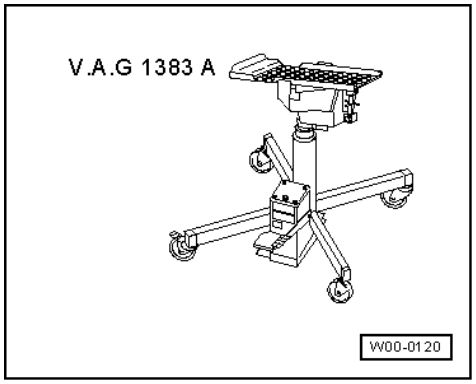
Pressing in wishbone rear bush

Notes:

- Press in using acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.

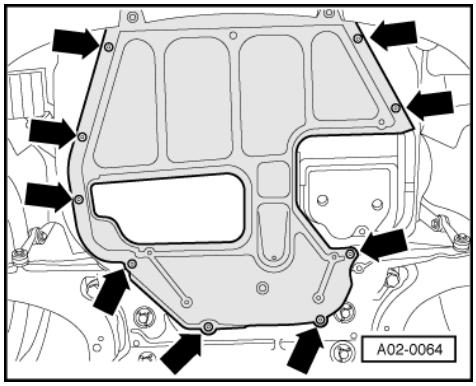
- -> Apply special tools shown and press in bush using workshop press V.A.G 1290 A.

1.15 - Removing and installing subframe - Audi A3



Special tools and workshop equipment required

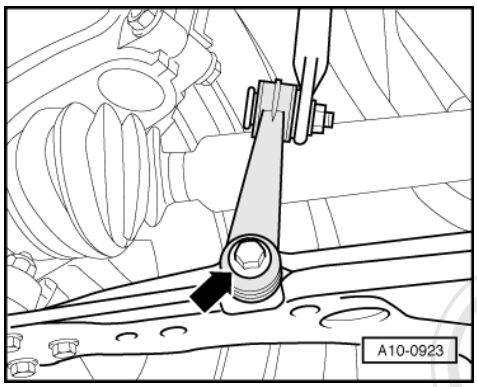
- Engine/gearbox lifter V.A.G 1383 A



Removing

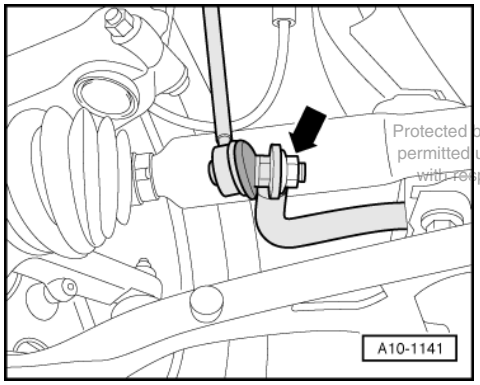
- Unscrew both front wheels.
- -> If necessary, remove centre noise insulation -arrows-.
- Unfasten noise insulation on left and right side at subframe.

- Unfasten headlight range control unit at wishbone on left
  =>Page 25 .



Front-wheel drive vehicles:

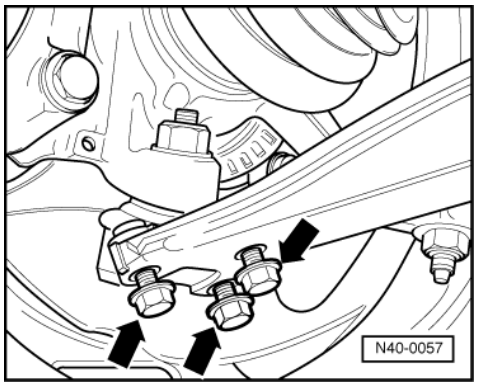
- -> Unscrew connecting links on left and right at wishbone -arrow-.



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Four-wheel drive vehicles:

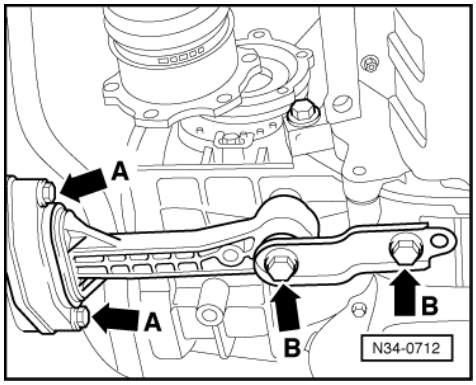
- -> Unscrew connecting links on left and right of anti-roll bar -arrow-.



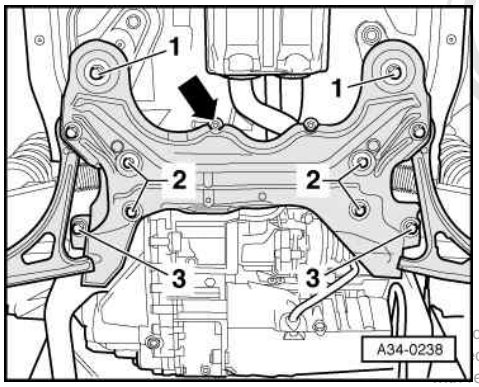
All models:

- -> Screw out bolts -arrows- at ball joint on left and right.

- Unscrew drive shaft on left and right from gearbox flange.
- Use wire to tie drive shafts to body.

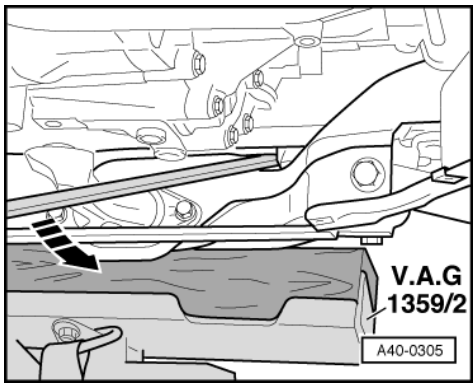


- -> First screw out bolts -A-, then bolts -B- of pendulum support.
- Detach pendulum support.

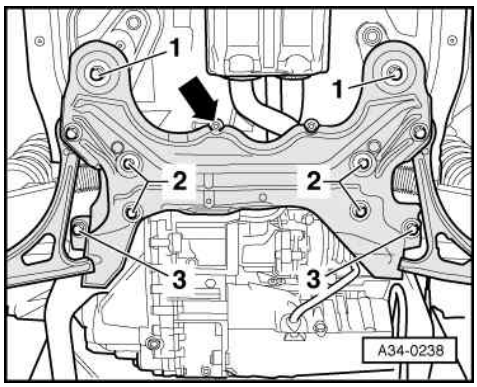


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- -> If fitted, disengage rubber mount at front exhaust pipe -arrow-.
- Screw out bolts -2- for steering box.

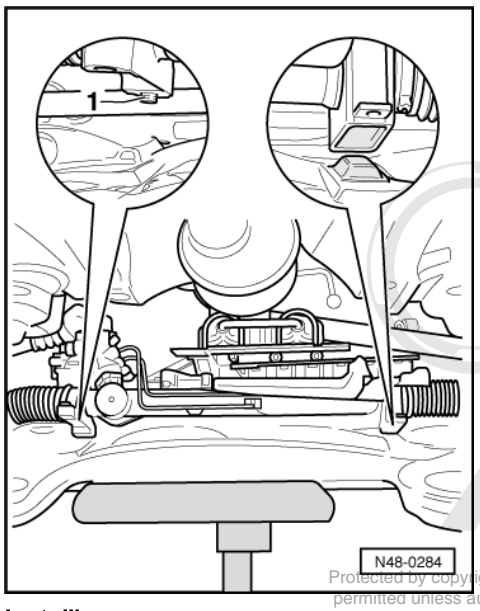


- -> Prise steering box off subframe (dowel sleeve) -arrow-.
- Unscrew holder for power steering pressure pipe on left of subframe.
- Position engine/gearbox lifter V.A.G 1383 A with universal mount V.A.G 1359/2 and wooden block beneath subframe.



- -> Screw out bolts -1- and -3- for subframe.
- Carefully lower subframe.

Note:
When lowering, pay attention to side noise insulation and holder for hydraulic pipes on left side.

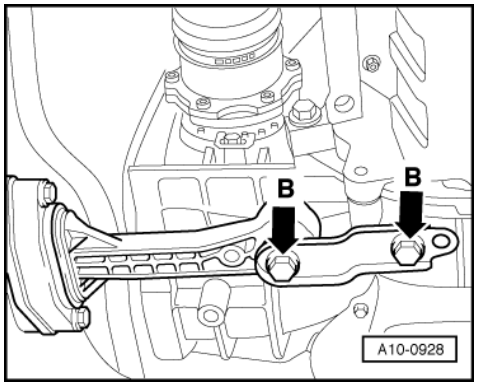


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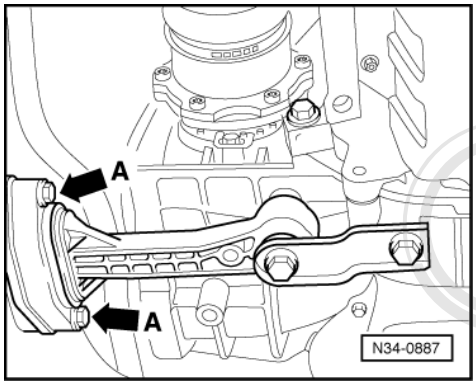
Installing

Install in reverse order, paying attention to the following:

- Install subframe as follows:
  - Move subframe to installation position and screw it on hand-tight using new bolts.
  - Position steering box on subframe and fit steering box bolts.
  - -> Threaded sleeve -1- must be positioned in hole in subframe
  - Rubber insert on opposite side must be positioned on corresponding projection on subframe
  - Screw on steering box => Page 326 .



- -> Screw on pendulum support at gearbox -arrows B-.
- Use new bolts for attachment.



- Press engine/gearbox assembly towards bulkhead.
- -> Screw on pendulum support at subframe -arrows A-.
- Use new bolts for attachment.
- Check correct positioning of sealing collar at steering box pinion.
- Install ball joints => Page 34 .
- Screw on drive shafts at gearbox flange => Page 113 .

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Tightening torques

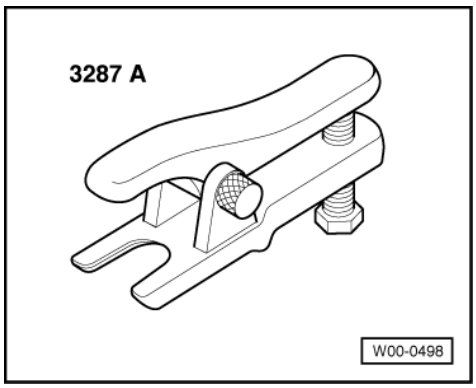
Component	Nm
Subframe to body	100 + 90° 1)2)
Steering box to subframe	20 + 90°1)2
Pendulum support to subframe	20 + 90°1)2)
Pendulum support to gearbox	40 + 90° 1)2)
Holder for power steering pressure pipe to subframe	23
Connecting link to wishbone (FWD)	15 + 90° 1)2)
Connecting link to anti-roll bar (4WD)	90

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

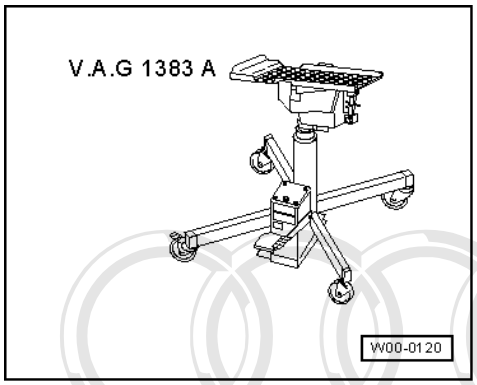
Perform wheel alignment after installation.

1.16 - Removing and installing subframe - Audi S3

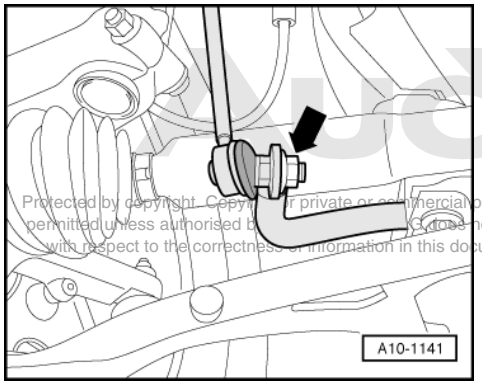


Special tools and workshop equipment required

- Ball joint puller 3287 A



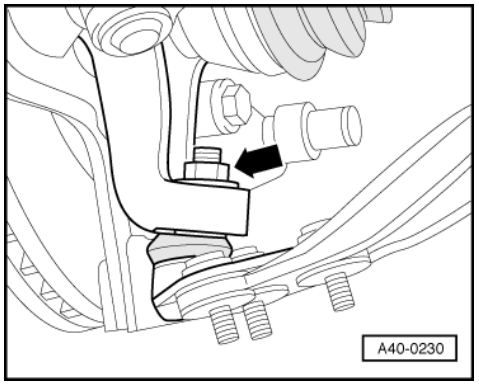
- Engine/gearbox lifter V.A.G 1383 A



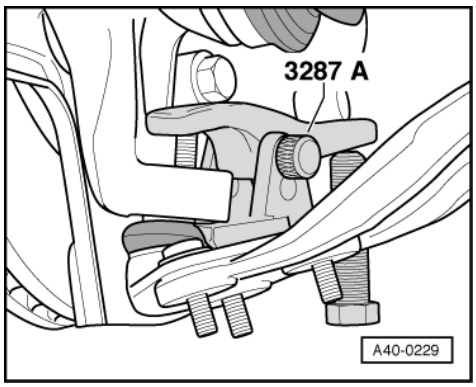
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Removing

- Unscrew both front wheels.
- Unfasten noise insulation on left and right side at subframe.
- Unfasten headlight range control unit on left at wishbone =>Page 25 .
- -> Unscrew connecting links on left and right of anti-roll bar -arrow-.



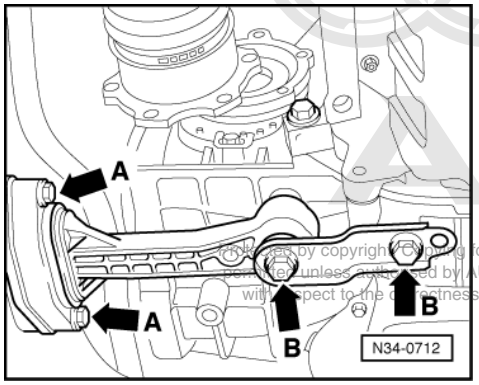
- -> Unscrew nut -arrow-.



- -> Apply ball joint puller 3287 A to ball joint as shown.

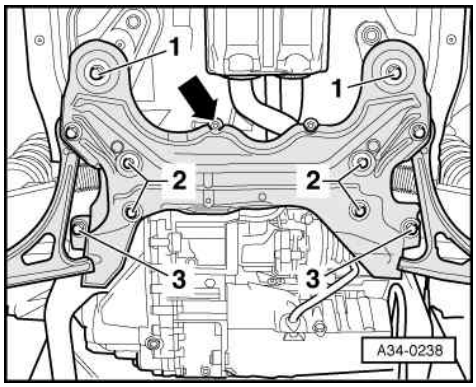
Note:

Leave nut screwed several turns onto ball joint to protect thread.

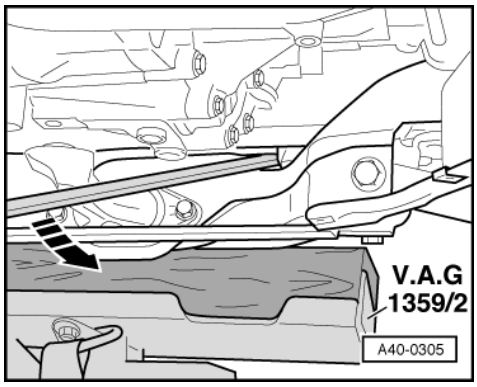


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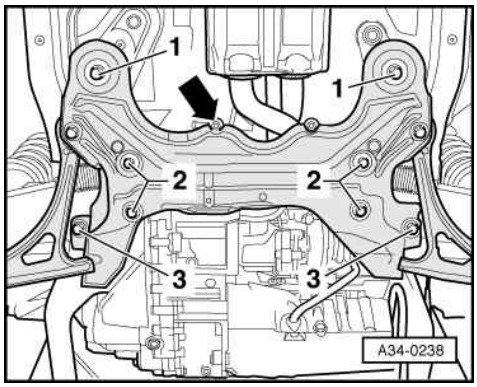
- -> First screw out bolts -A-, then bolts -B- of pendulum support.
- Detach pendulum support.



- -> Disengage rubber mount at front exhaust pipe -arrow-.
- Screw out bolts -2- for steering box.



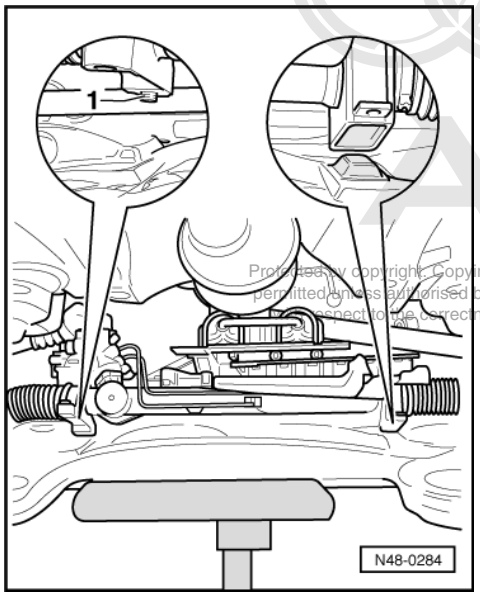
- -> Prise steering box off subframe (dowel sleeve) -arrow-.
- Unscrew holder for power steering pressure pipe on left of subframe.
- Position engine/gearbox lifter V.A.G 1383 A with universal mount V.A.G 1359/2 and wooden block beneath subframe.



- -> Screw out bolts -1- and -3- for subframe.
- Carefully lower subframe.

Note:

When lowering, pay attention to side noise insulation and holder for hydraulic pipes on left side.

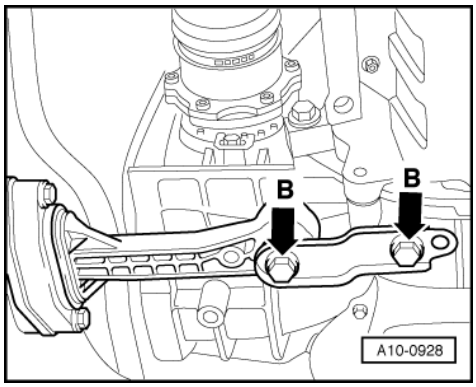


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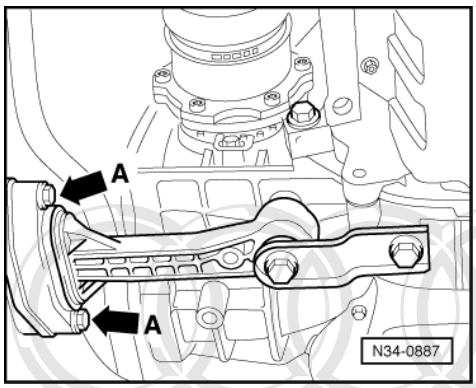
Installing

Install in reverse order, paying attention to the following:

- Install subframe as follows:
  - Move subframe to installation position and screw it on hand-tight using new bolts.
  - Position steering box on subframe and fit steering box bolts.
  - -> Threaded sleeve -1- must be positioned in hole in subframe
  - Rubber insert on opposite side must be positioned on corresponding projection on subframe
  - Screw on steering box => Page 326 .



- -> Screw on pendulum support at gearbox -arrows B-.
- Use new bolts for attachment.



- Press engine/gearbox assembly towards bulkhead.
- -> Screw on pendulum support at subframe -arrows A-.
- Use new bolts for attachment.
- Check correct positioning of sealing collar at steering box pinion.
- Install ball joints => Page 34 .

Tightening torques

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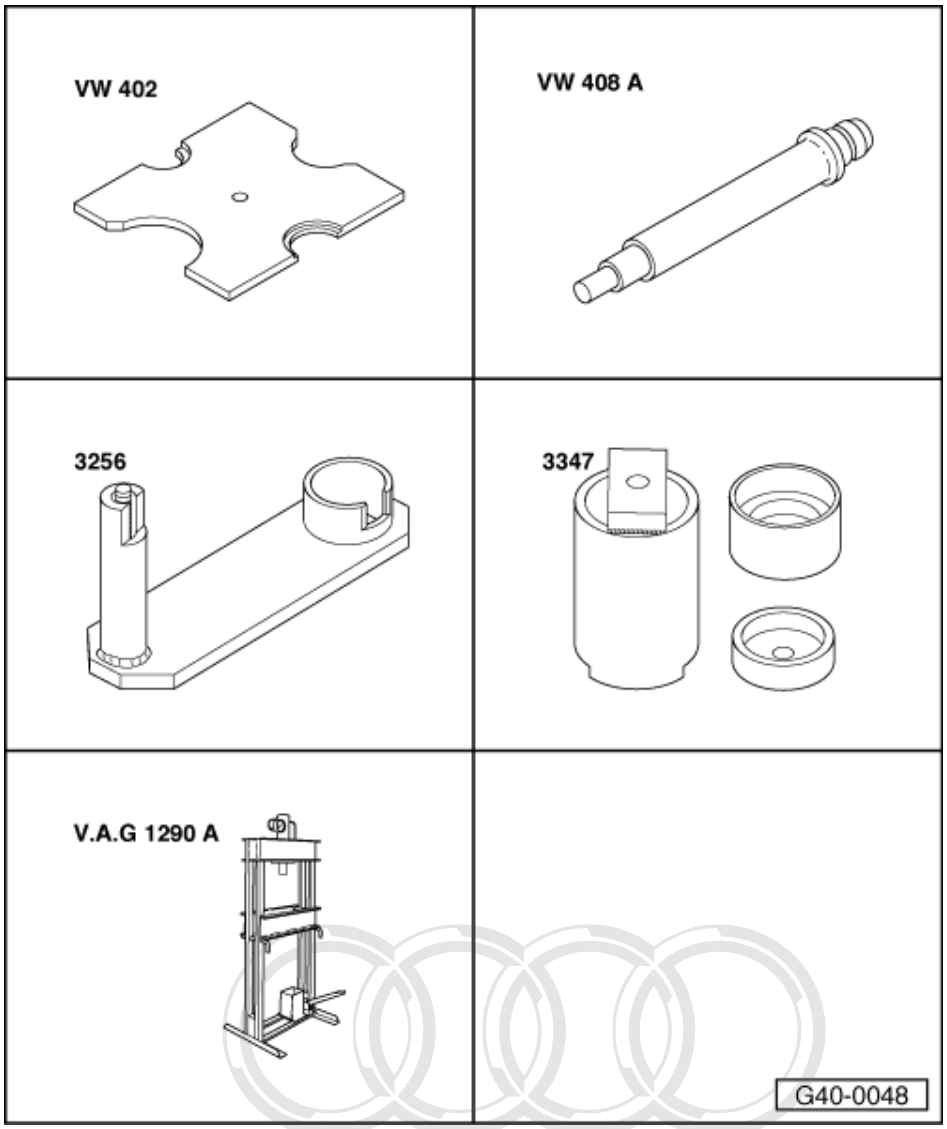
Component	Nm
Subframe to body	100 + 90° 1)2)
Steering box to subframe	20 + 90°1)2
Pendulum support to gearbox	40 + 90° 1)2)
Pendulum support to subframe	20 + 90°1)2)
Holder for power steering pressure pipe to subframe	23
Connecting link to anti-roll bar	90

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

Perform wheel alignment after installation.

1.17 - Replacing subframe bonded rubber bushes - Audi A3



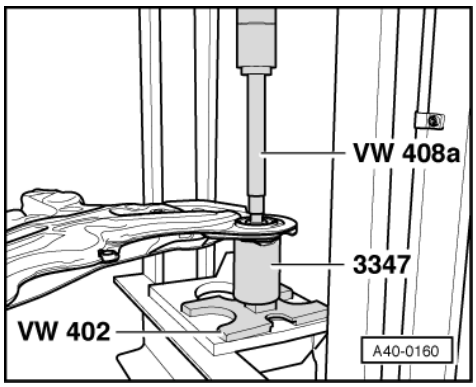
Special tools and workshop equipment required

- Thrust plate VW 402
- Press tool VW 408 A
- Counterhold 3256
- Assembly device 3347
- Workshop press V.A.G 1290 A

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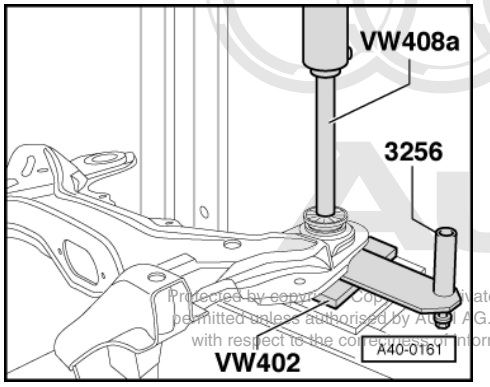
Subframe must be removed to replace one-piece bonded rubber bushes.

- Remove subframe => Page 49 .



Pressing out bonded rubber bush

- -> Press out bush using workshop press V.A.G 1290 A.



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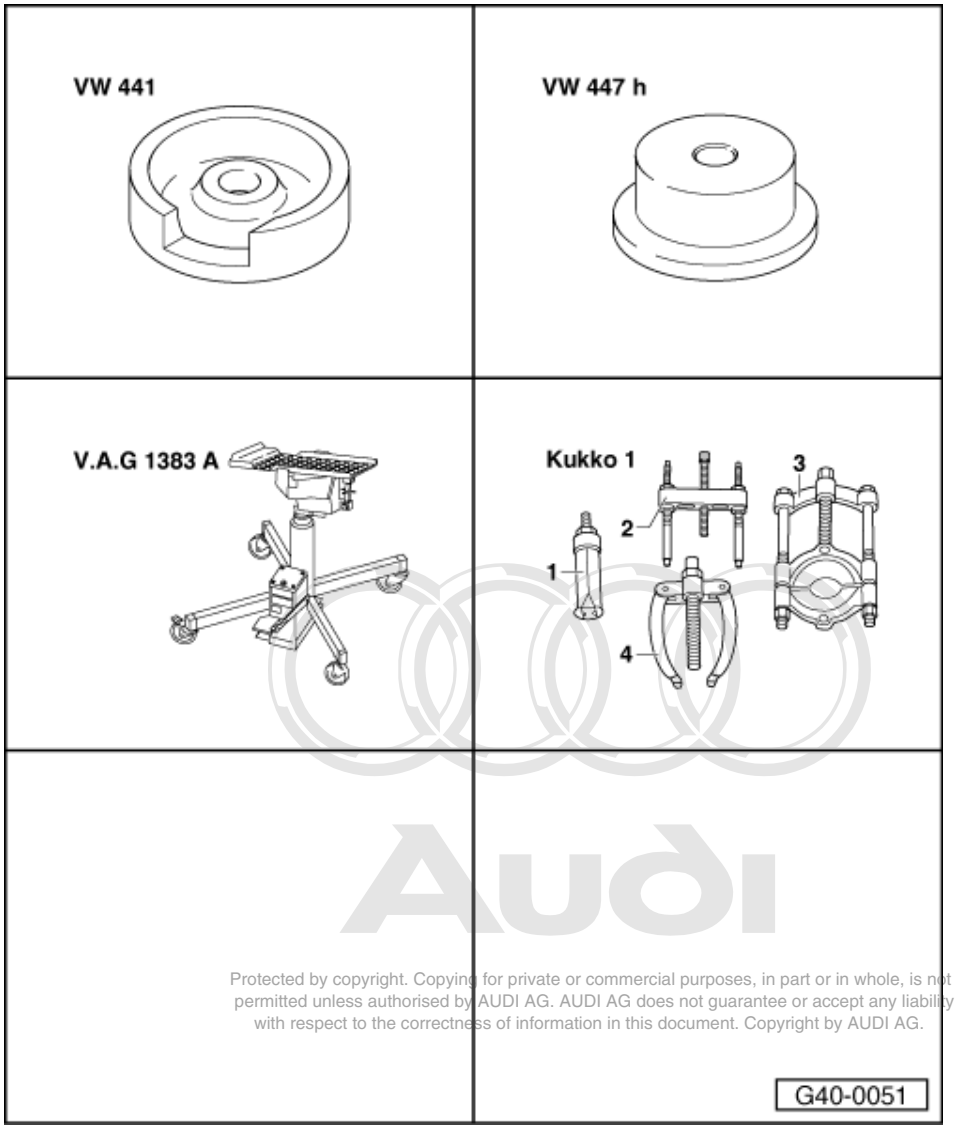
Pressing in bonded rubber bush

Notes:

- Press in using acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.

- -> Press in bush using workshop press V.A.G 1290 A.

1.18 - Replacing subframe bonded rubber bushes - Audi S3

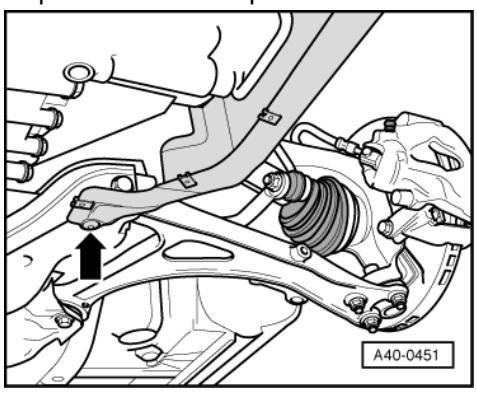


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Special tools and workshop equipment required

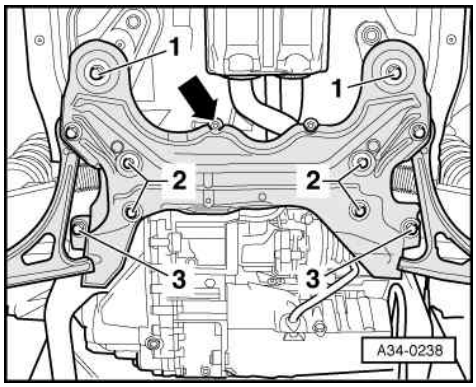
- Mount VW 441
- Thrust pad VW 447 H
- Engine/gearbox lifter V.A.G 1383 A
- 3 - Kukko 15/1 and 17/1 parting tools

Replacement of two-piece bonded rubber bushes involves unfastening and lowering subframe.

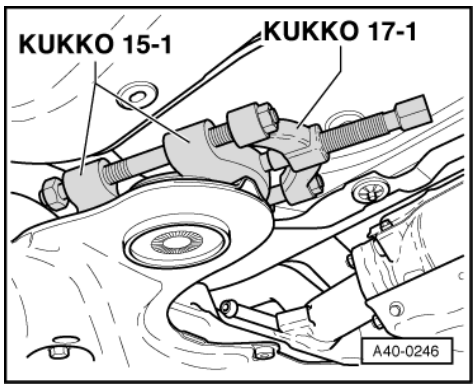


Removing

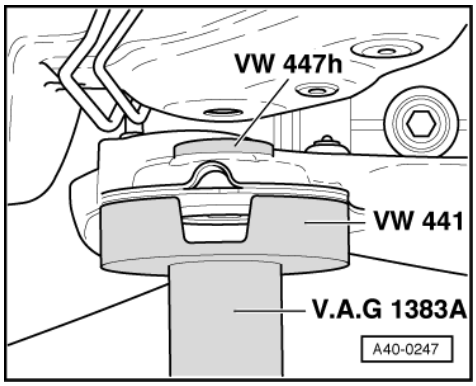
- -> Screw out bolt -arrow- at noise insulation.



- -> Disengage rubber mount at front exhaust pipe -arrow-.
- Screw out bolts -1- for subframe.
- Only slacken off subframe bolts -3- such that bushes become accessible.

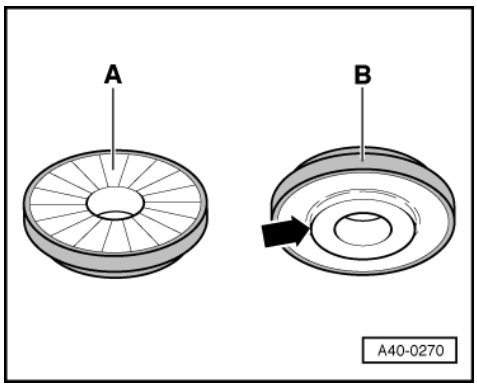


- -> Apply parting tool and pull out upper half of bush.



- Insert thrust pad VW 447 h.
- -> Use mount VW 441 and engine/gearbox lifter V.A.G 1383 A to press subframe upwards until bottom half of bush drops out.

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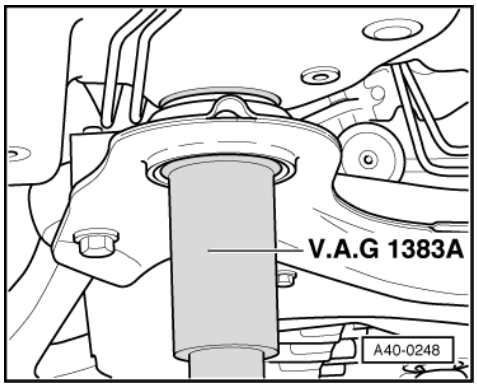
Installing

- Place both halves of bush in position at subframe.
- -> Installation position of bush halves

A - Upper half of bush without collar: ribs facing body
B - Lower half of bush: collar facing bolt head -arrow-

Notes:

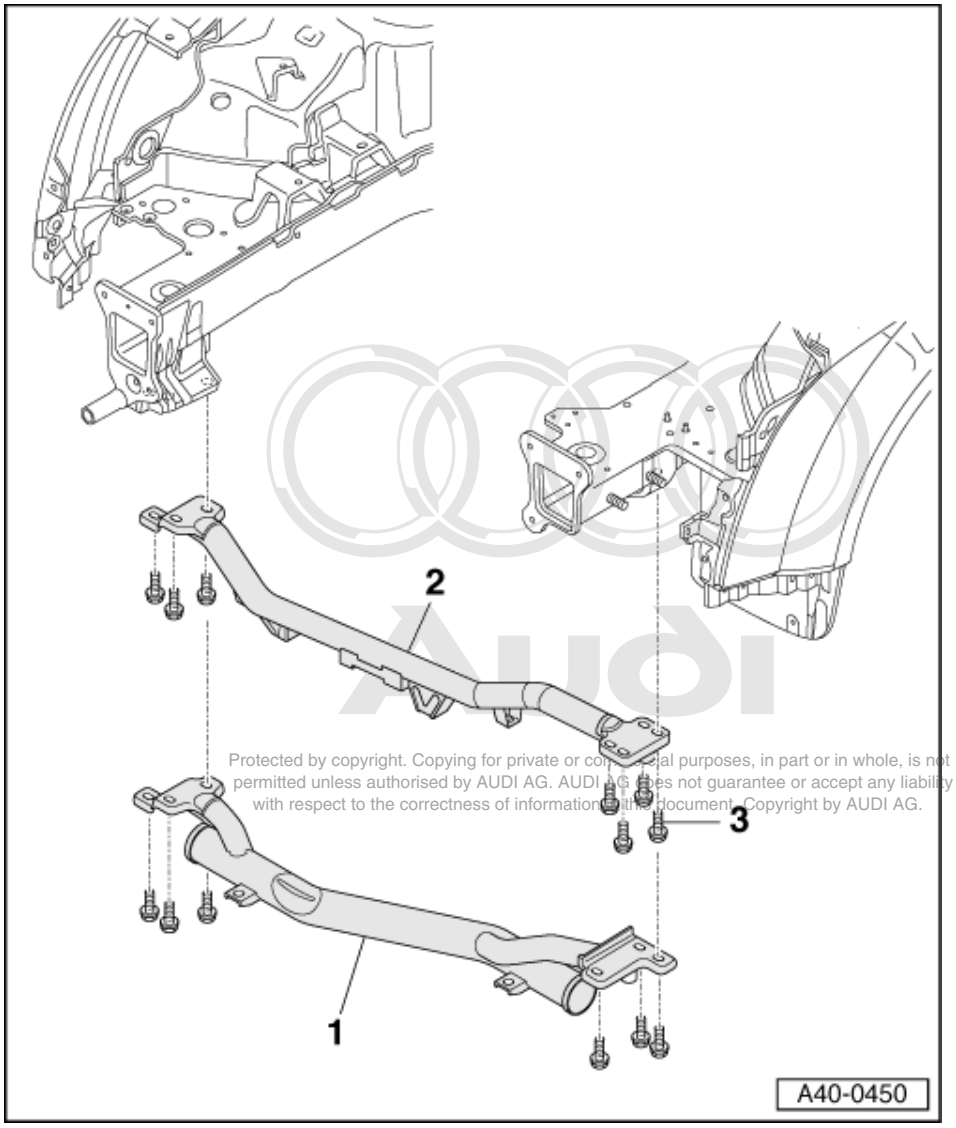
- Press in using acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.



- -> Use engine/gearbox lifter V.A.G 1383 A to press new bushes into subframe.
- Install subframe => Page 53 .

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1.19 - Exploded view of front cross-piece



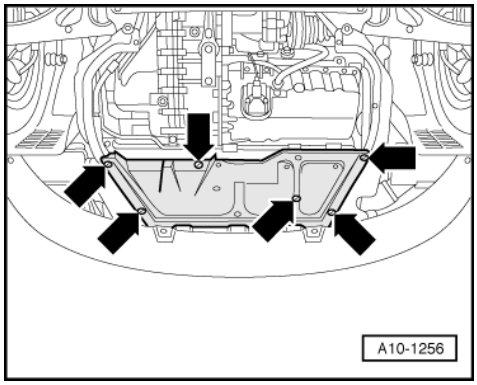
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1 **Cross-piece**
- With air duct
- Removing and installing=>Page 64

2 **Cross-piece**
- Removing and installing=>Page 64

3 **Bolt, 20 Nm**

1.20 - Removing and installing cross-piece

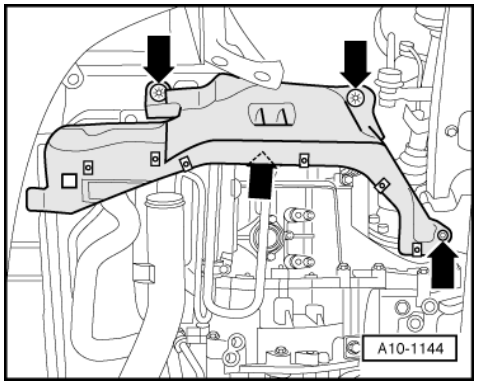


Removing

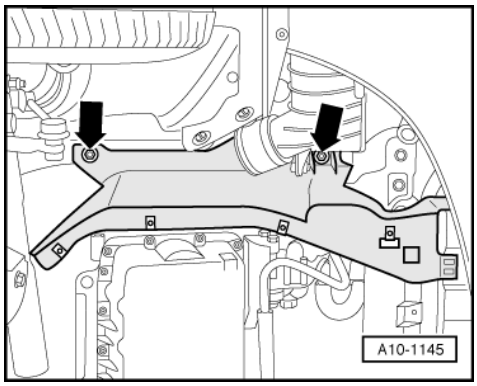
Note:

The following description relates to removal and installation on Audi S3.

- -> Remove centre noise insulation -arrows-.

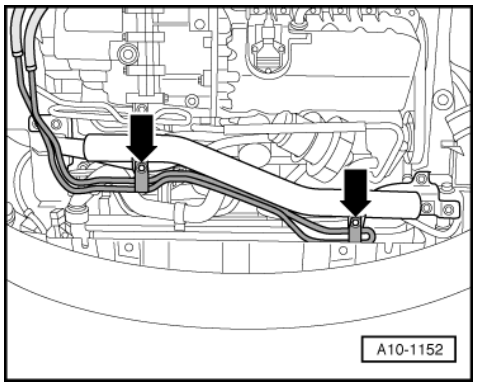


- -> Remove left noise insulation -arrows-.

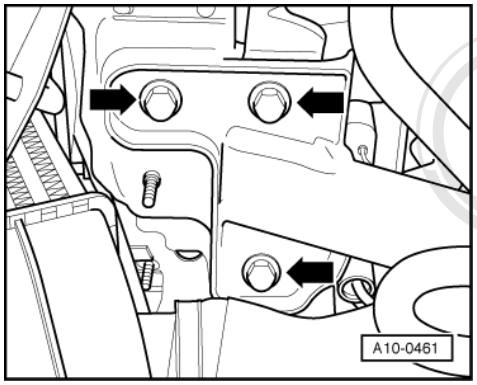


- -> Remove right noise insulation -arrows-.

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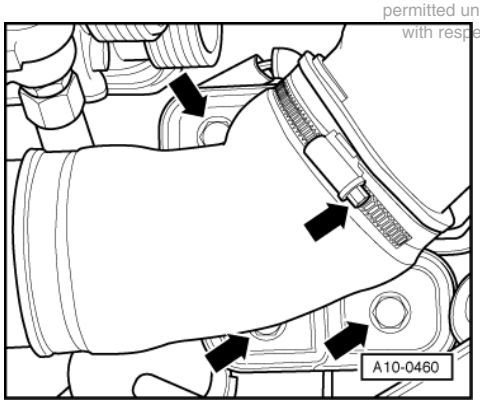


- -> If fitted, detach power steering hydraulic pipe from cross-piece -arrows-.



- -> Unscrew cross-piece between the two charge-air coolers on left...

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- -> ...and right from longitudinal members; unscrew both hoses to charge-air cooler.
- Detach cross-piece.

Installing

Install in reverse order.

Tightening torques

Component	Nm
Cross-piece to suspension	20
Power steering hydraulic pipe to cross-piece	8

2 - Wheel bearing housing

2.1 - Wheel bearing housing

General:

Loadbearing and suspension elements are not to be welded and straightened.

Wheel bearings are not to be subjected to load after unfastening drive shaft bolted joint on wheel end.

Subjecting the wheel bearings to the dead weight of the vehicle would cause wheel bearing damage and shorten their service life. Attention is therefore to be paid to the following:

- Procedure for unfastening twelve-point nut => Page 108
- Procedure for slackening off hexagon collared bolt => Page 109

Never move vehicles without drive shaft fitted, as otherwise wheel bearing damage will result. Should it nevertheless become necessary to move the vehicle, always heed the following:

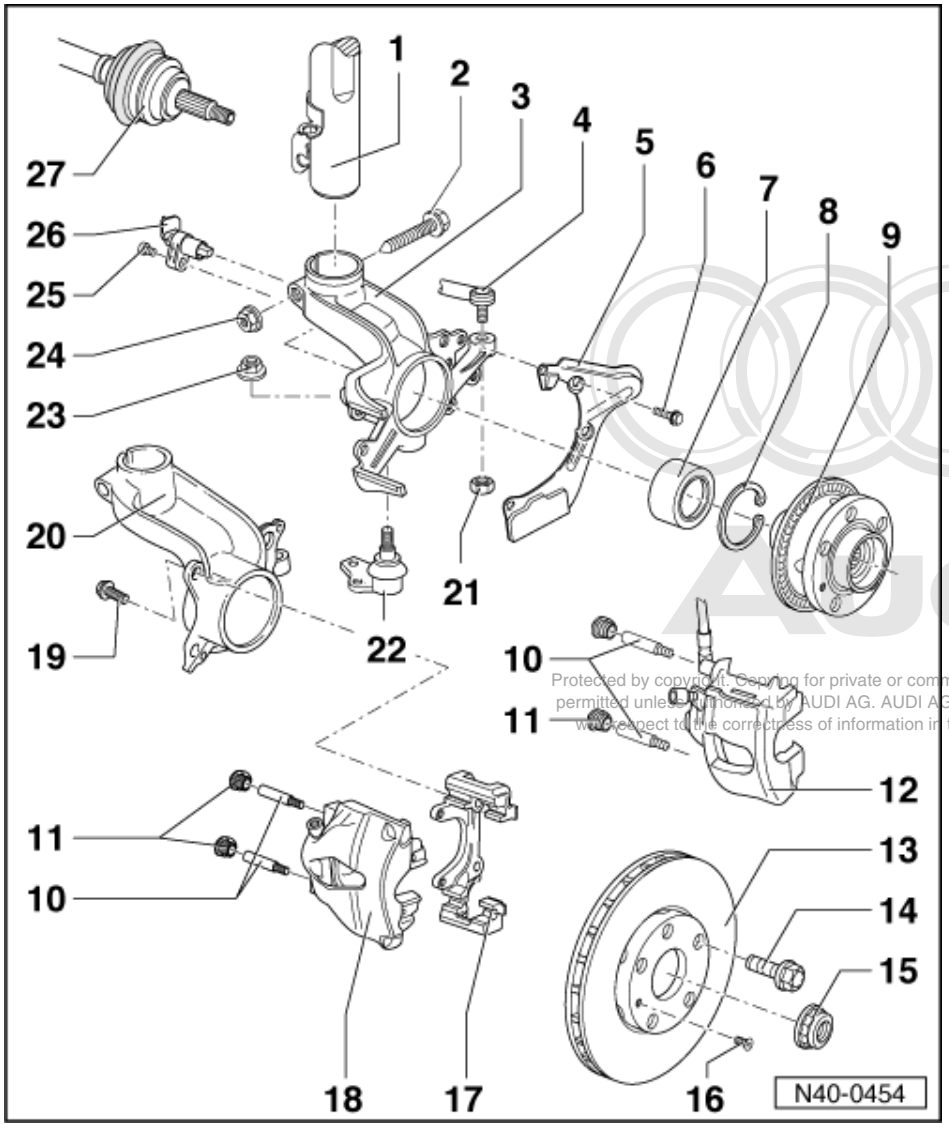
- Fit an outer joint instead of the drive shaft.
- Tighten the outer joint to 120 Nm.

If wheel alignment is subsequently to be performed on vehicle, bolts and nuts to be unfastened for adjustment work are only to be tightened to torque. These bolts and nuts are then to be finish-tightened by the prescribed extra turn on completion of wheel alignment/adjustment.

Attention:
All bolts and nuts must be properly tightened on vehicles being used on public roads.

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2.2 - Exploded view of wheel bearing housing components Audi A3



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1 Suspension strut

- Separating suspension strut from wheel bearing housing => Fig. 1
- Exploded view of components
  => Page 97

2 Bolt

- Always replace together with nut
  -Item 24 - after removing
- Threaded end of bolt must face in direction of travel

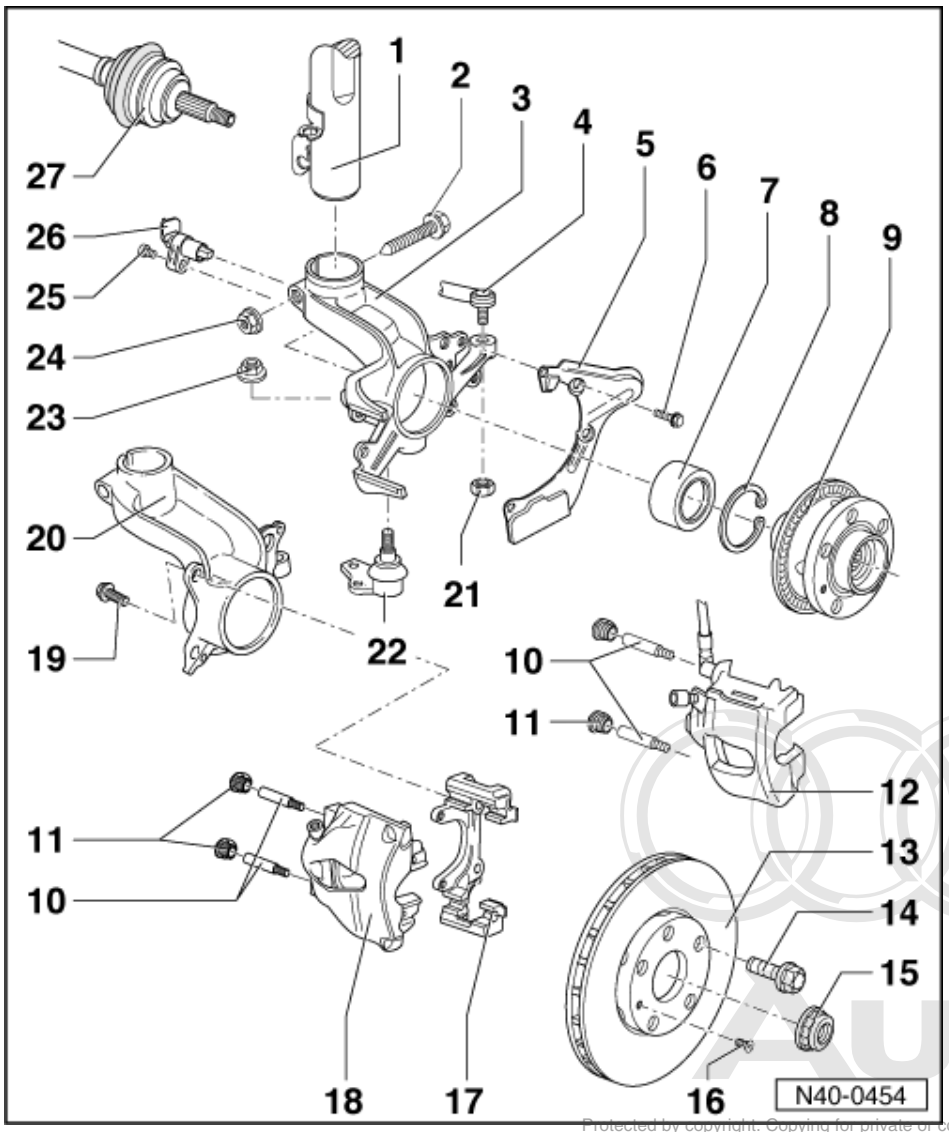
3 Wheel bearing housing

- For brake FS 3
- Removing and installing=>Page 86

4 Track rod end

- Removing and installing=>Page 316

5 Splash plate



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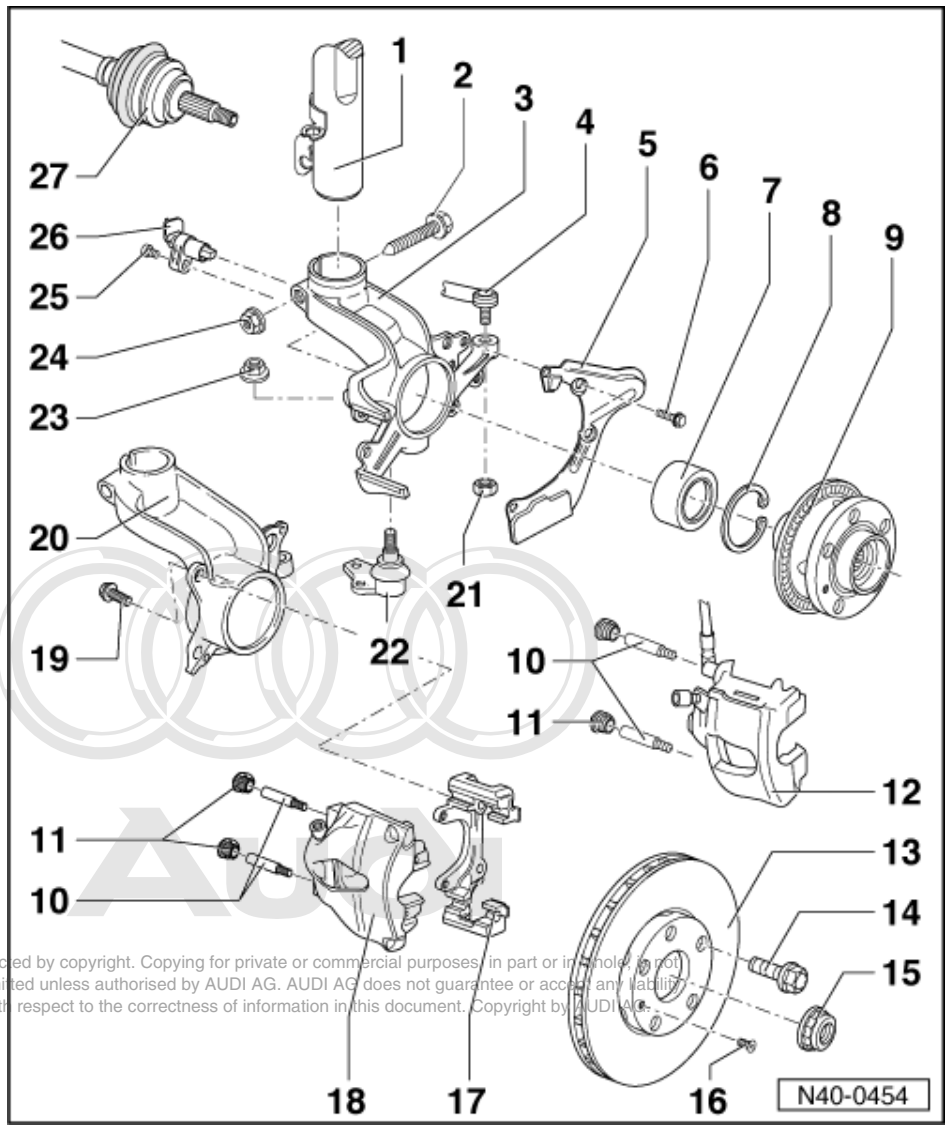
6 **Bolt**
- Tightening torque:

=> Brake System; Repair Group 46

7 **Wheel bearing**
- Replace; destroyed on pressing out
- Removing and installing with wheel bearing housing fitted =>Page 79
- Removing and installing with wheel bearing housing removed =>Page 92

8 **Circlip**
- Ensure firm attachment

9 **Wheel hub with rotor for speed sensor**
- Rotor is welded to wheel hub
- Removing and installing with wheel bearing housing fitted => Page 79
- Removing and installing with wheel bearing housing removed => Page 92



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10 Guide pin

- Tightening torque:

=> Brake System; Repair Group 46

11 Cap

12 Brake caliper

- For brake FS 3
- Do not disconnect brake hose when working on front suspension
- Tie in position with wire or the like

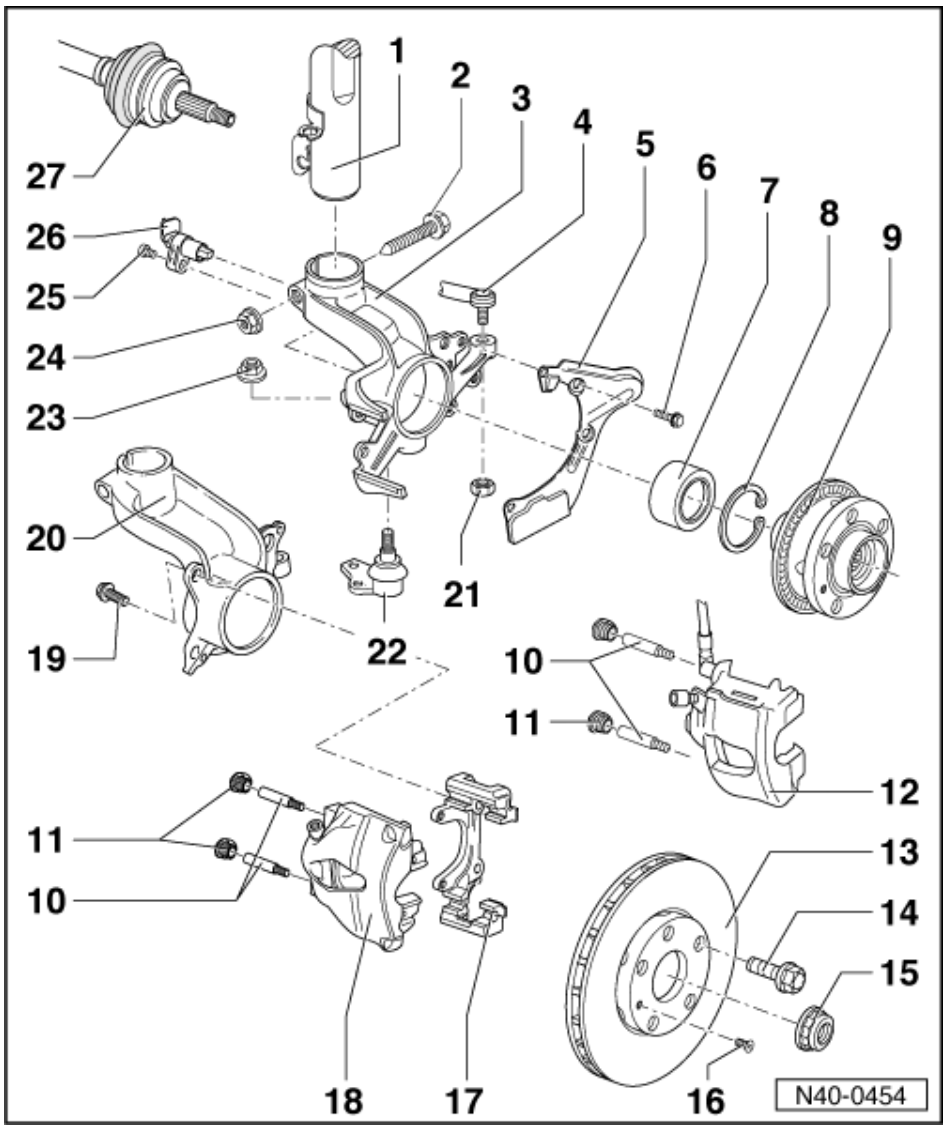
13 Ventilated brake disc

14 Wheel bolt

- Tightening method and torque
  => Page 273

15 Twelve-point nut

- Self-locking
- Always replace after removing
- Unfastening and tightening
  => Page 108



16 Cross-head bolt

- Tightening torque:

=> Brake System; Repair Group 46

17 Brake carrier

- For brake FN 3

18 Brake caliper

- For brake FN 3
- Do not disconnect brake hose when working on front suspension
- Tie in position with wire or the like

19 Ribbed bolt

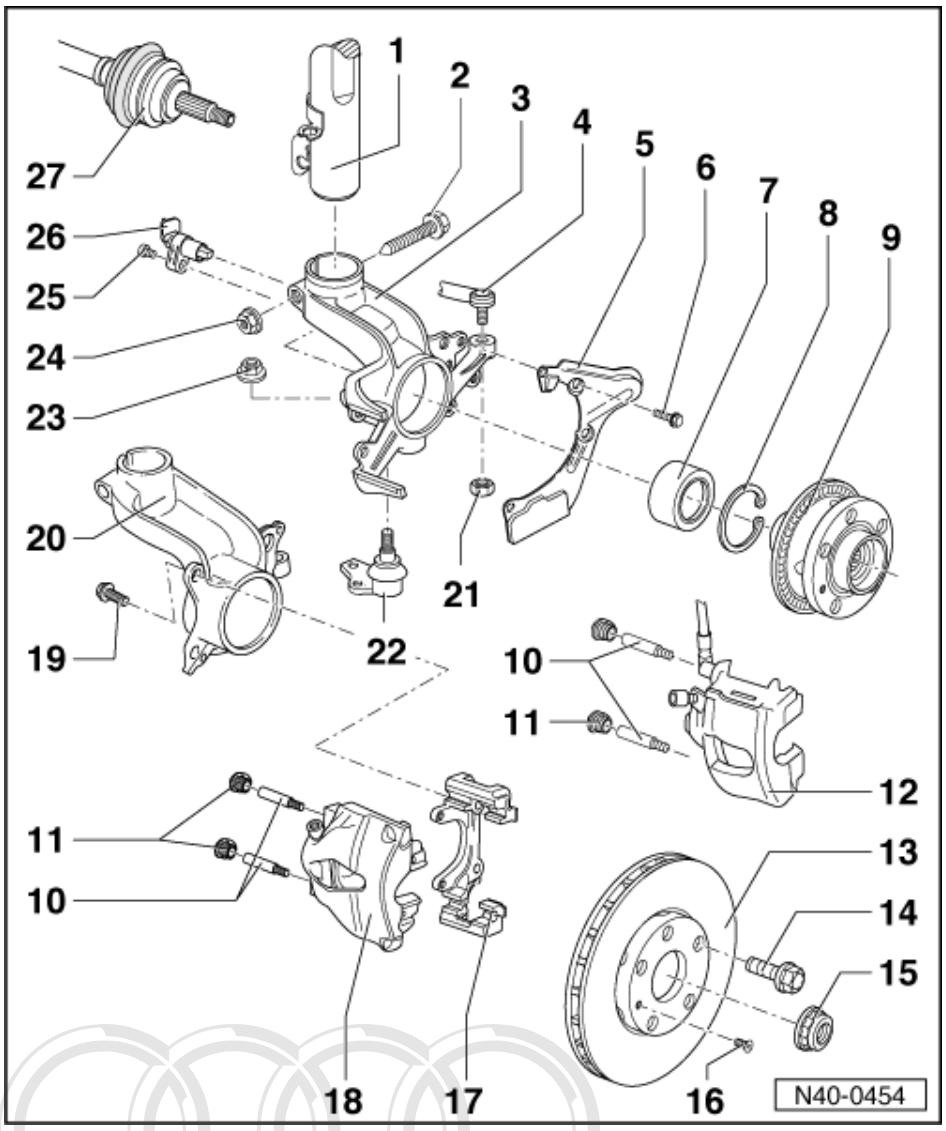
- Use wire brush to clean ribs
- Tightening torque:

=> Brake System; Repair Group 46

20 Wheel bearing housing

- For brake FN 3
- Removing and installing=>Page 86

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21 Nut, 45 Nm

- Self-locking
- Always replace after removing

22 Ball joint

- Removing and installing=>Page 32

23 Nut, 45 Nm

- Self-locking
- Always replace after removing

24 Nut - 60 Nm + further 90° (1/4) turn

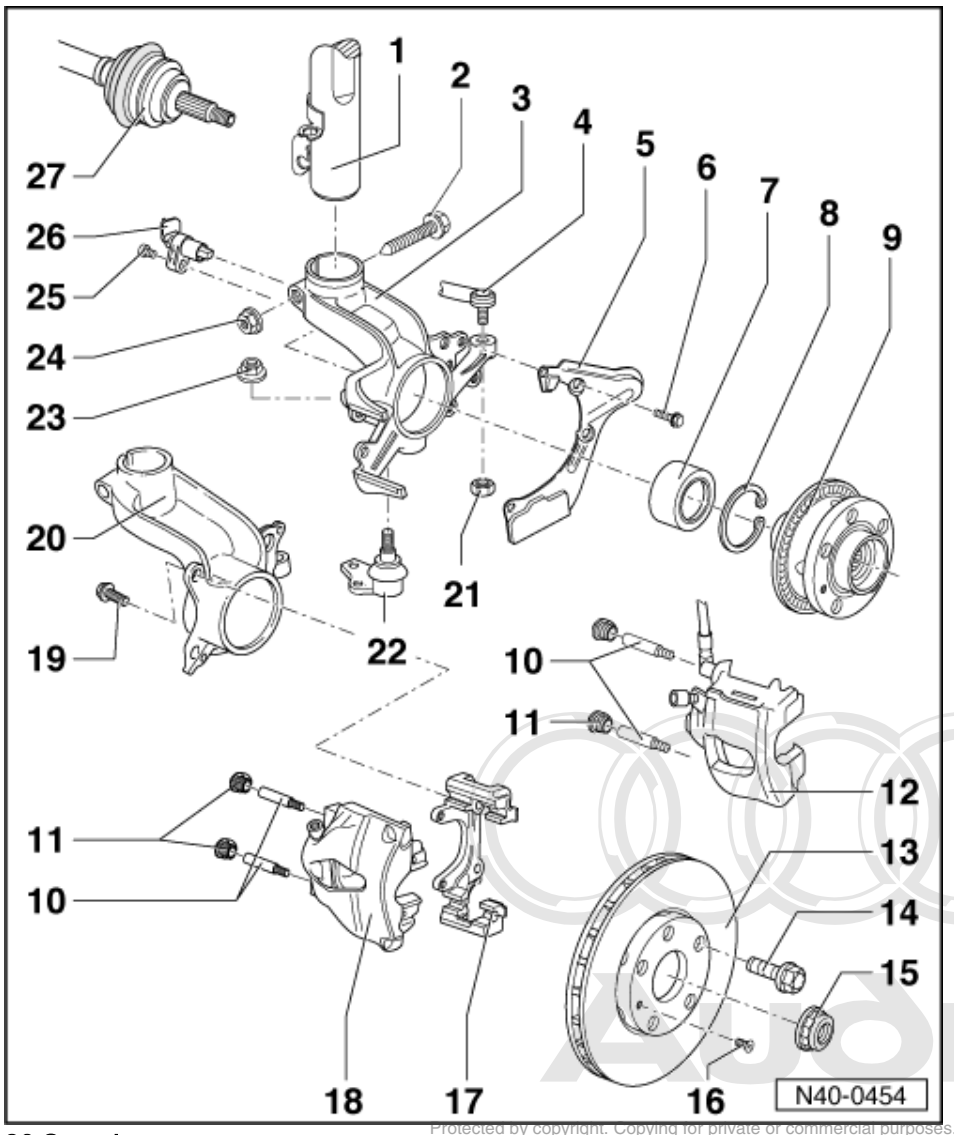
- Self-locking
- Always replace together with bolt -Item 2- after removing

25 Hexagon socket-head bolt

- Tightening torque:

=> Brake System; Repair Group 45

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26 Speed sensor

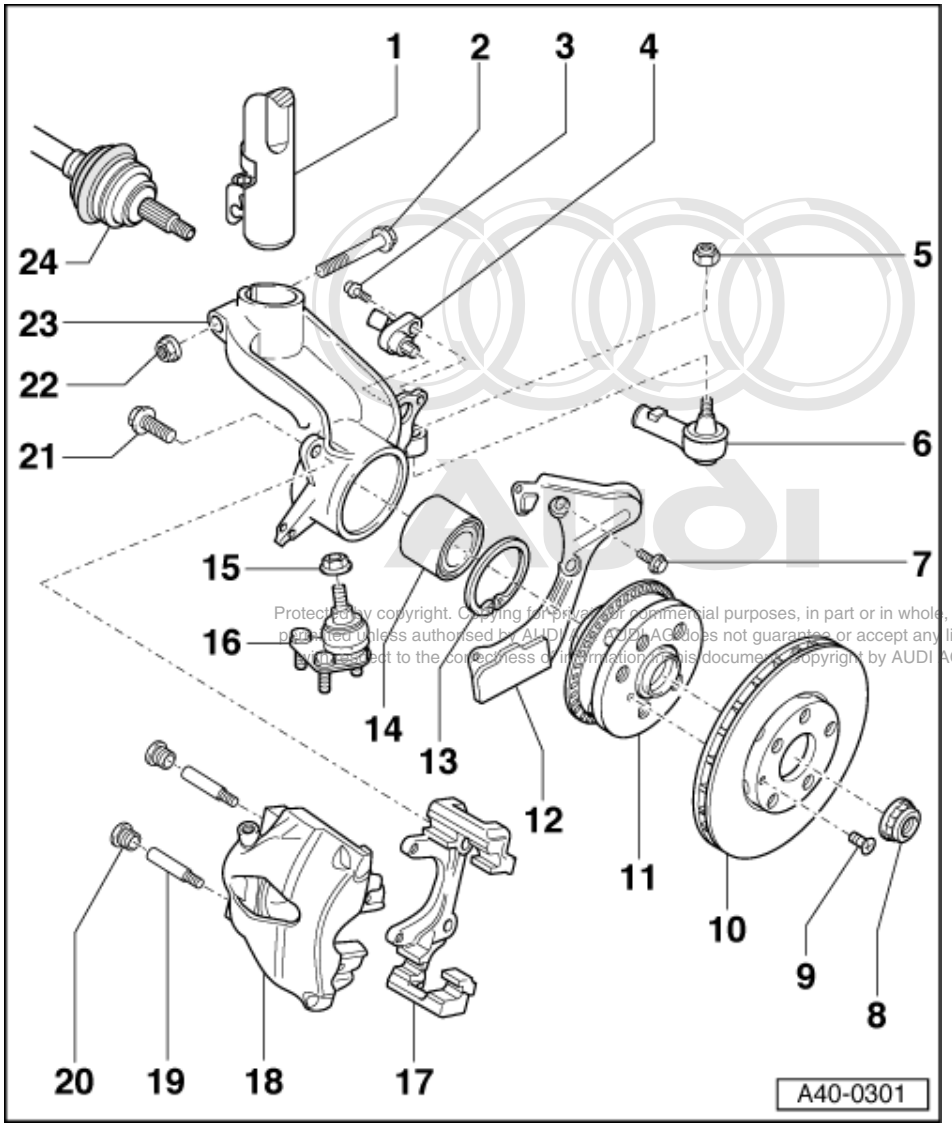
27 Drive shaft

- Different versions; assignment

=> Parts List

- Pressing out of and into wheel hub
  =>Removing and installing drive shafts, Page 110

2.3 - Exploded view of wheel bearing housing components Audi S3



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1 Suspension strut

- Separating suspension strut from wheel bearing housing => Fig. 1
- Exploded view of components
  => Page 97

2 Bolt

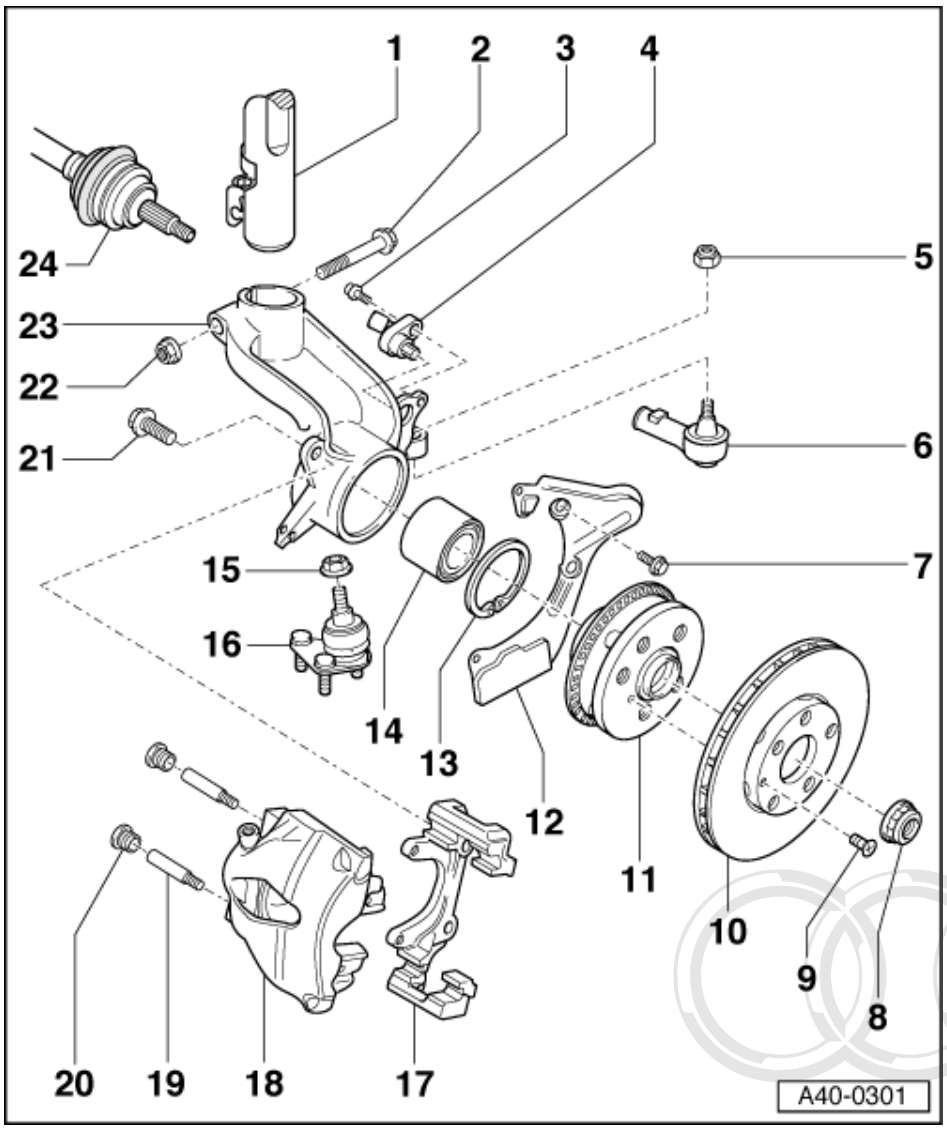
- Always replace together with nut
  -Item 22 - after removing
- Threaded end of bolt must face in direction of travel

3 Hexagon socket-head bolt

- Tightening torque:

=> Brake System; Repair Group 45

4 Speed sensor



5 Nut, 45 Nm
- Self-locking
- Always replace after removing

6 Track rod end
- Removing and installing=>Page 316

7 Bolt
- Tightening torque:

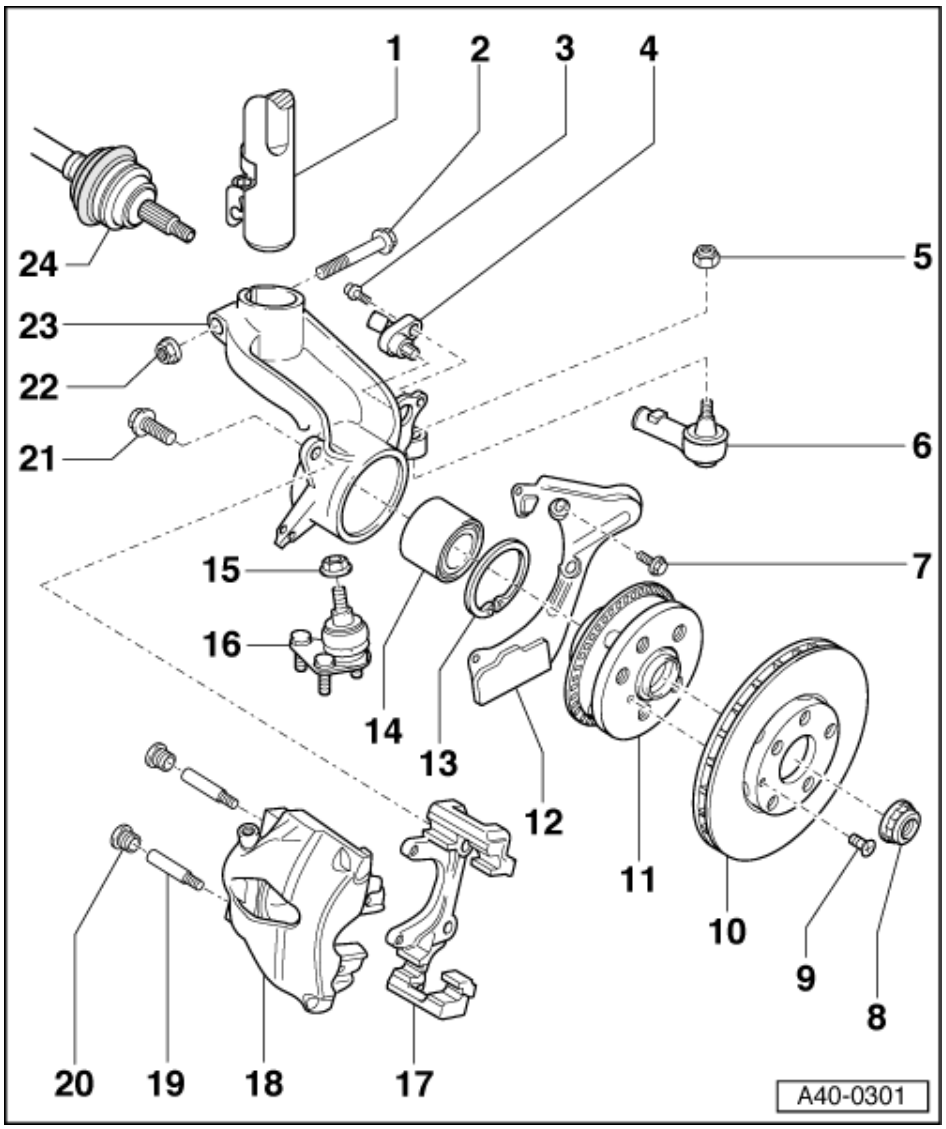
=> Brake System; Repair Group 46

8 Twelve-point nut
- Self-locking
- Always replace after removing
- Unfastening and tightening => Page 108
- In conjunction with 18" running gear: Hexagon collared bolt instead of twelve-point nut; unfastening and tightening=> Page 109

9 Cross-head bolt
- Tightening torque:

=> Brake System; Repair Group 46

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10 Ventilated brake disc

11 Wheel hub with rotor for speed sensor

- Rotor is welded to wheel hub
- Removing and installing with wheel bearing housing fitted =>Page 79
- Removing and installing with wheel bearing housing removed => Page 92

12 Splash plate

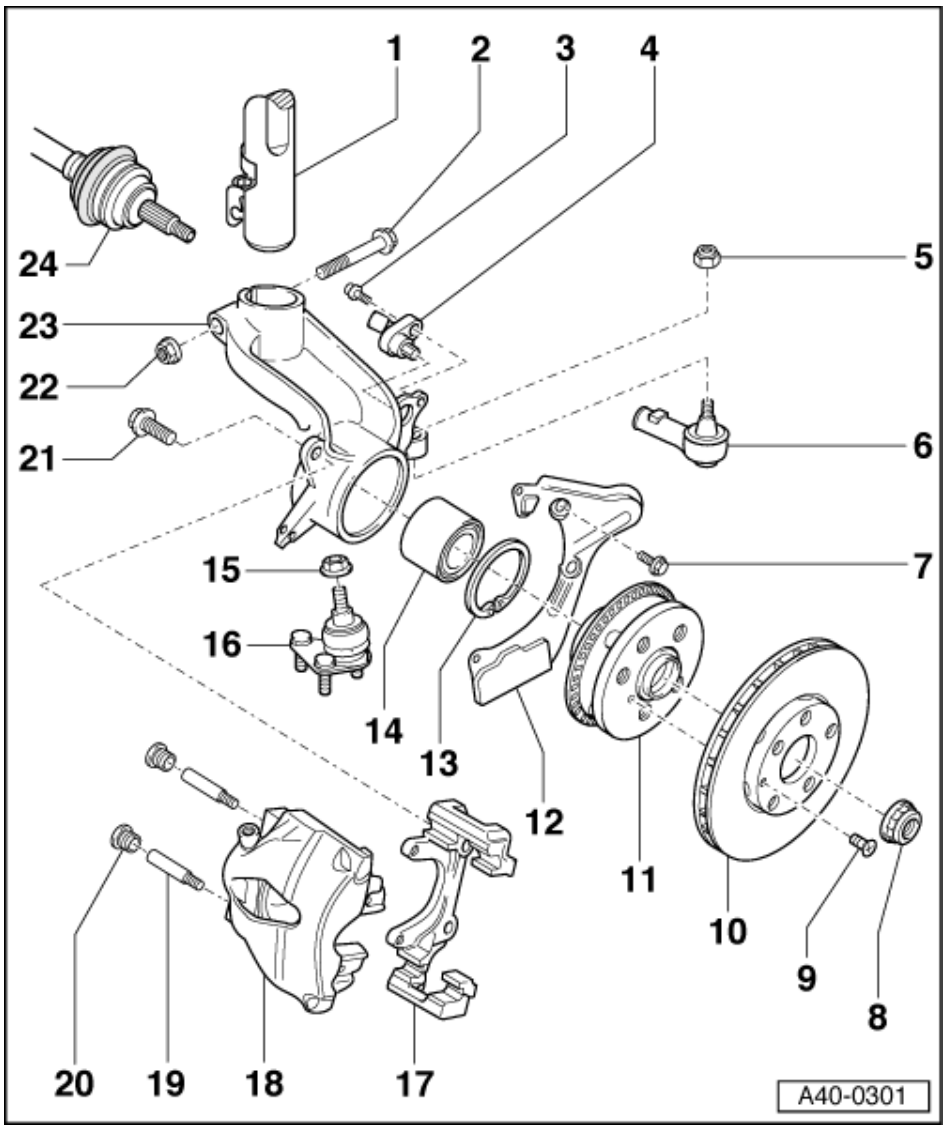
13 Circlip

- Ensure firm attachment

14 Wheel bearing

- Replace; destroyed on pressing out
- Removing and installing with wheel bearing housing fitted => Page 79
- Removing and installing with wheel bearing housing removed => Page 92

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15 Nut, 45 Nm

- Self-locking
- Always replace after removing

16 Ball joint

- Removing and installing=>Page 32

17 Brake carrier

18 Brake caliper

- Do not disconnect brake hose when working on front suspension
- Tie in position with wire or the like

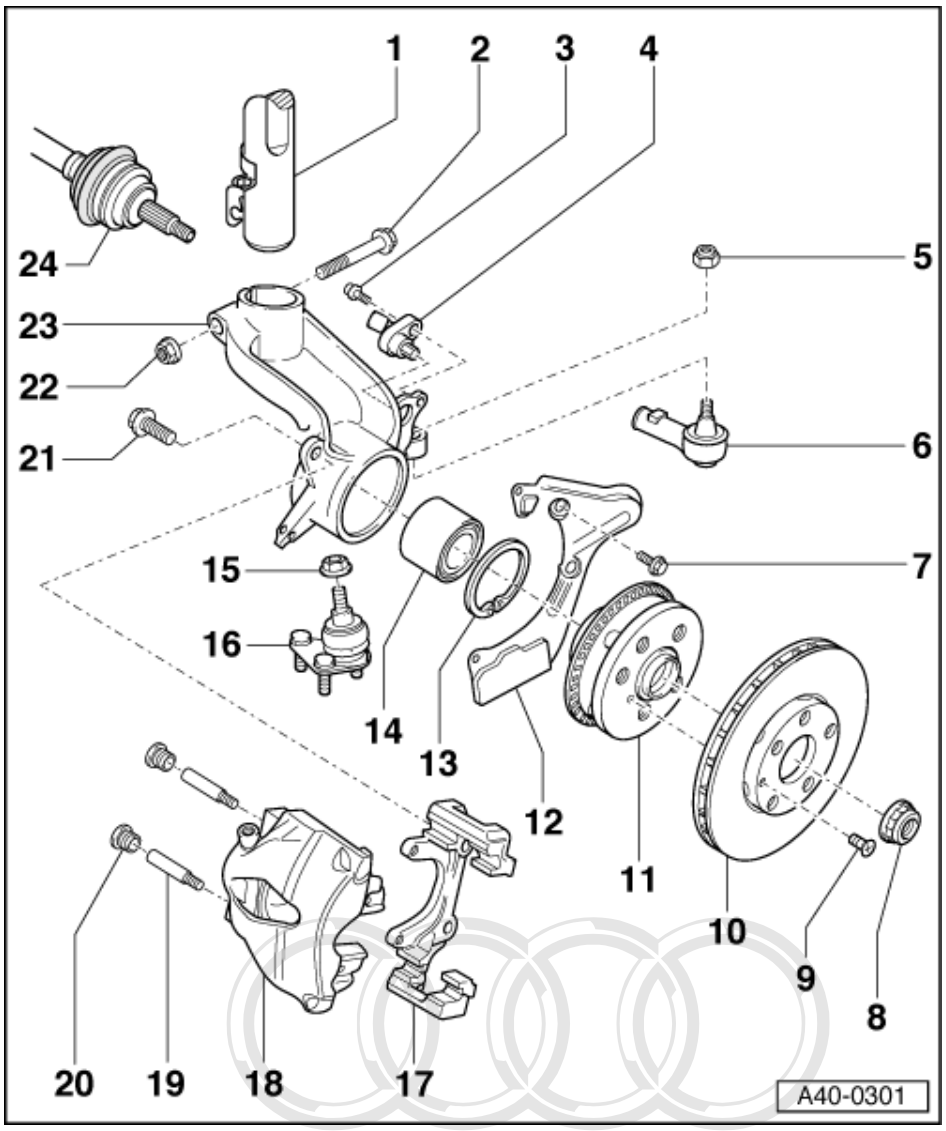
19 Guide pin

- Tightening torque:

=> Brake System; Repair Group 46

20 Cap

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21 Ribbed bolt

- Use wire brush to clean ribs
- Tightening torque:

=> Brake System; Repair Group 46

22 Nut - 60 Nm + further 90° (1/4) turn

- Self-locking
- Always replace together with bolt -Item 2 - after removing

23 Wheel bearing housing

- Removing and installing=>Page 86

24 Drive shaft

- Different versions; assignment

=> Parts List

- Pressing out of and into wheel hub =>Removing and installing drive shafts, Page 110
- In conjunction with 18" running gear: Secured with hexagon collared bolt instead of twelve-point nut=> Page 109

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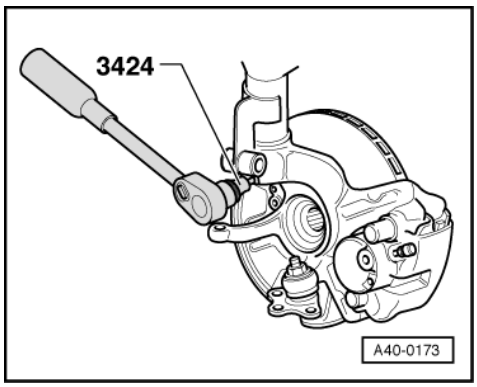
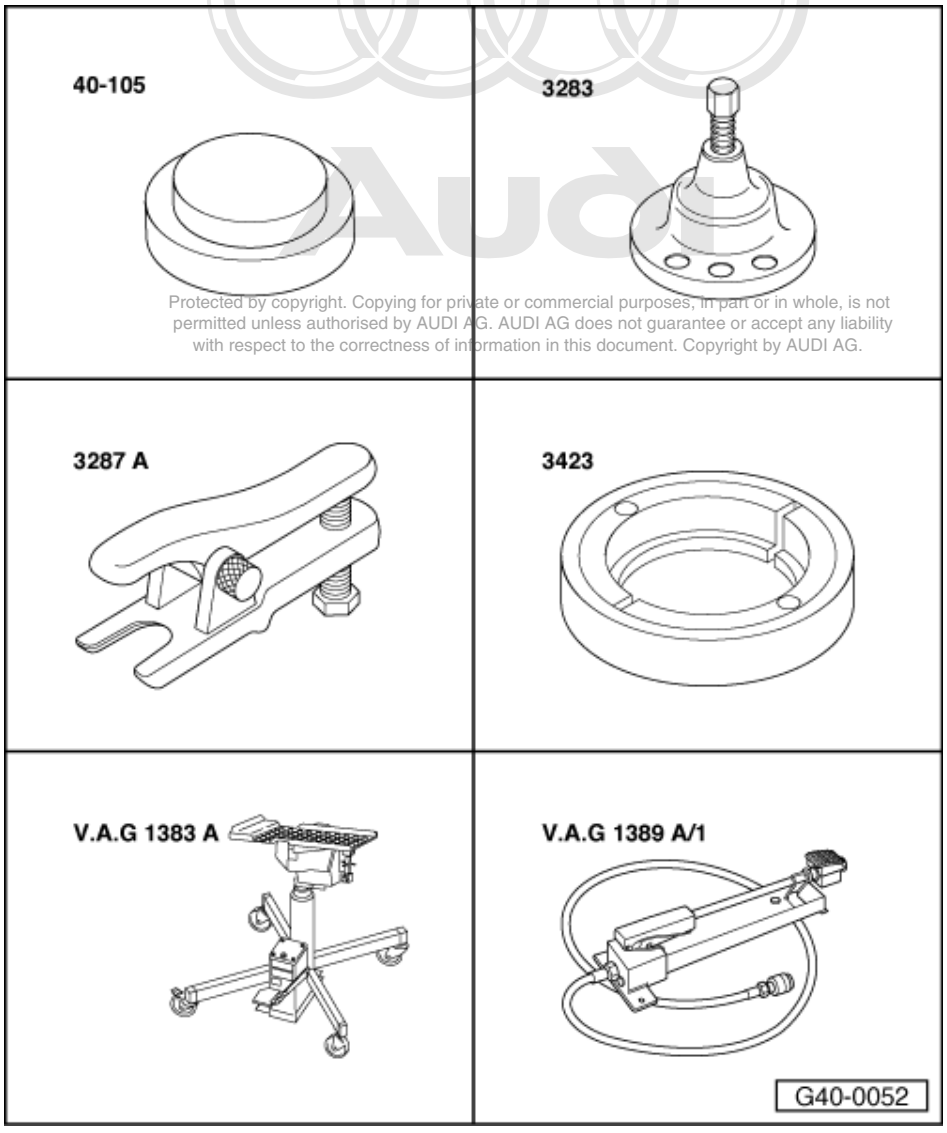


Fig.1-> Separating suspension strut from wheel bearing housing

- Insert spreader tool 3424 in slot at wheel bearing housing.
- Turn ratchet handle through 90° and detach from spreader tool 3424.
- Detach wheel bearing housing downwards from shock absorber tube.

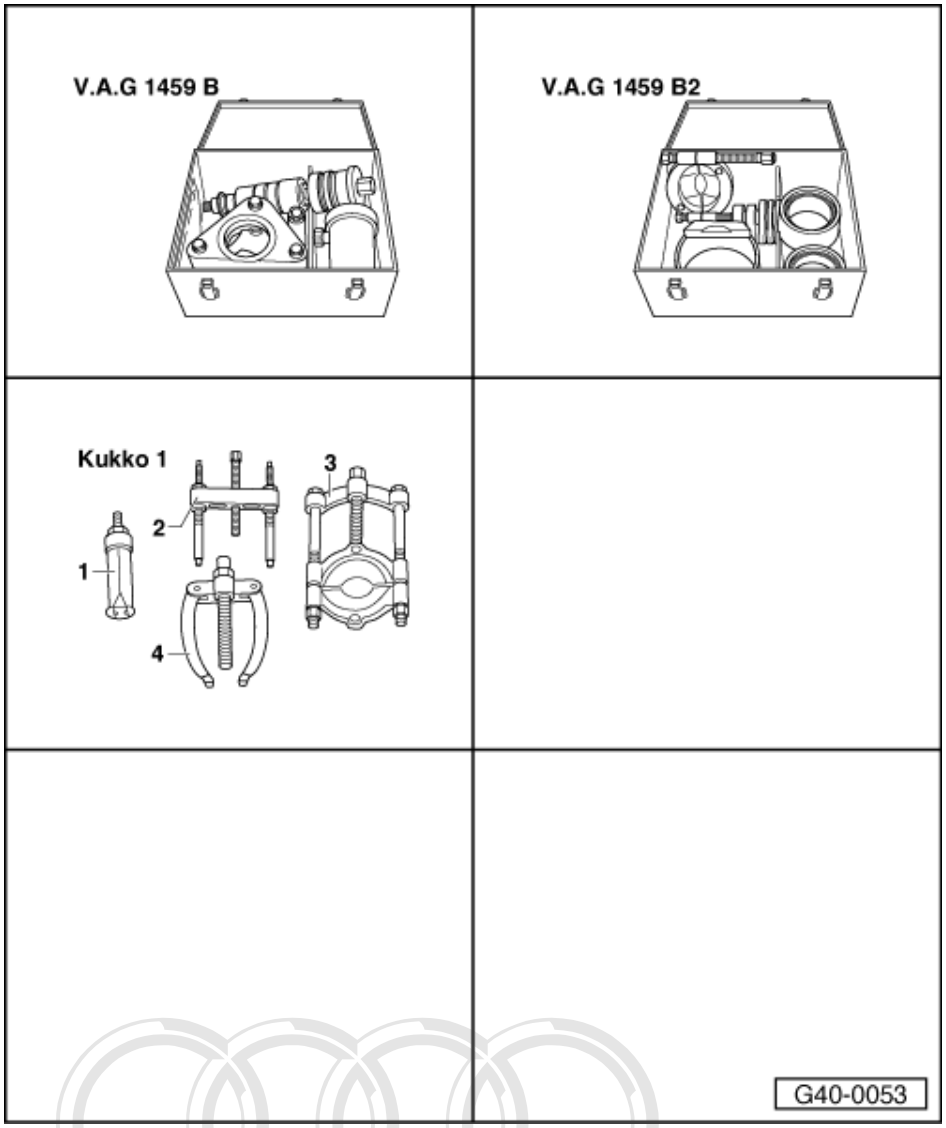
2.4 - Replacing front wheel bearing with wheel bearing housing fitted



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Special tools and workshop equipment required

- 40-105 Thrust plate
- Pressing-out tool 3283
- Ball joint puller 3287 A
- Puller 3423
- Engine/gearbox lifter V.A.G 1383 A
- Foot-operated pump with high-pressure hose V.A.G 1389 A/1

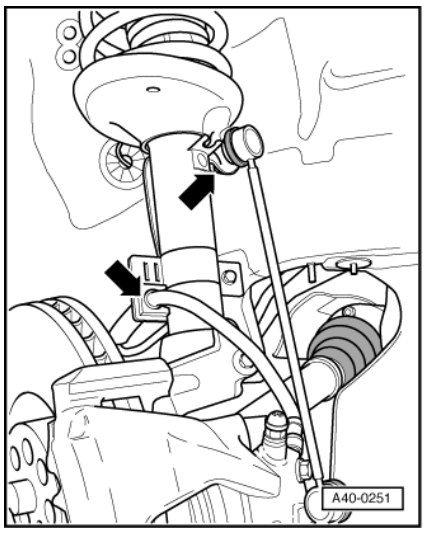


- Hydraulic removal and installation device V.A.G 1459 B
- Accessory set V.A.G 1459 B2
- 2 - Kukko 18/0 puller

Sequence of operations

- Unfasten drive shaft bolted joint on wheel end.
  - Procedure for unfastening twelve-point nut => Page 108
  - Procedure for slackening off hexagon collared bolt => Page 109
- Remove wheel.

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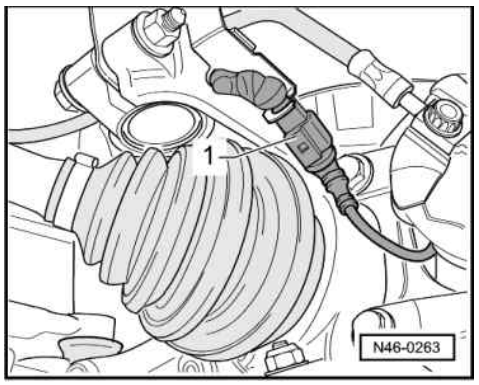
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Four-wheel drive vehicles:

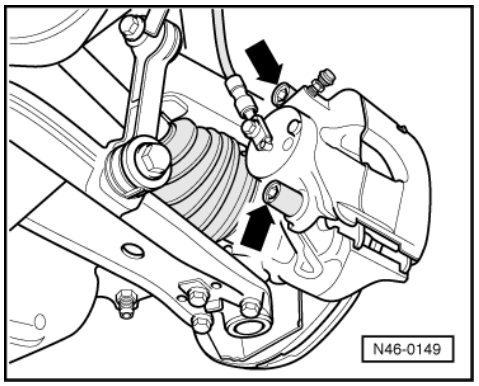
- -> Unscrew connecting link from suspension strut.

All models:

- Pull out spring clip of holder and disengage brake hose.
- Disengage speed sensor wire from suspension strut.



- -> Unplug connector -1- of brake pad wear indicator at left brake.



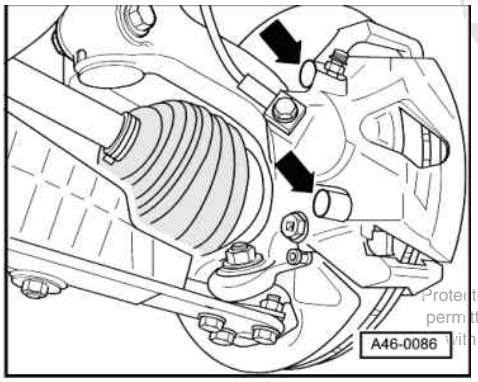
Vehicles with brake caliper FS 3:

- Detach caps.
- -> Screw out guide pins -arrows-.

- Detach brake caliper and hang up with piece of wire.

Note:

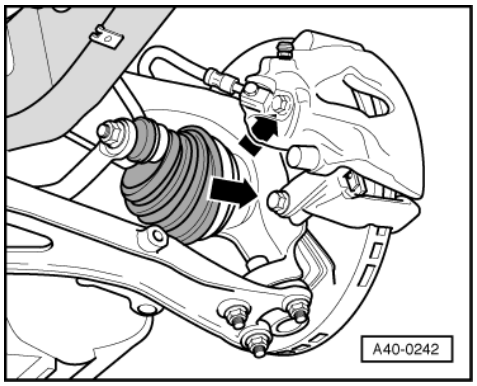
Brake hose/pipe is never to be twisted or kinked.



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Vehicles with brake caliper FN 3:

- -> Detach caps -arrows-.



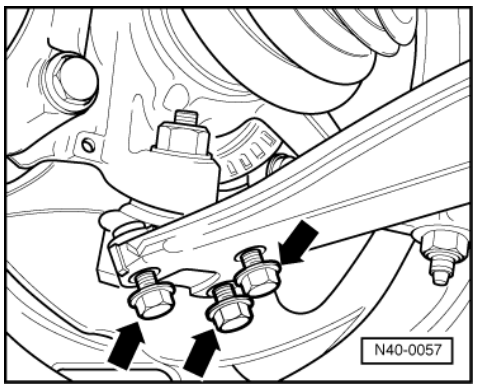
- -> Screw out bolts -arrows-.
- Detach brake caliper and hang up with piece of wire.

Note:

Brake hose/pipe is never to be twisted or kinked.

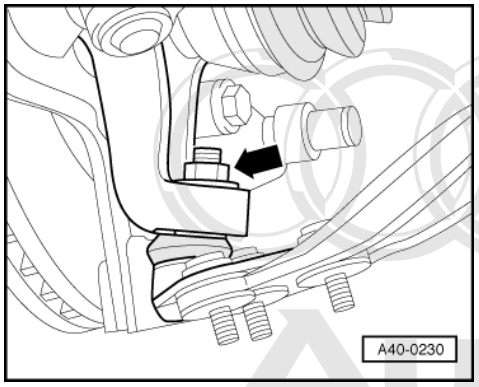
All models:

- Screw out cross-head bolt for brake disc and detach brake disc.
- Remove brake disc splash plate.



Audi A3:

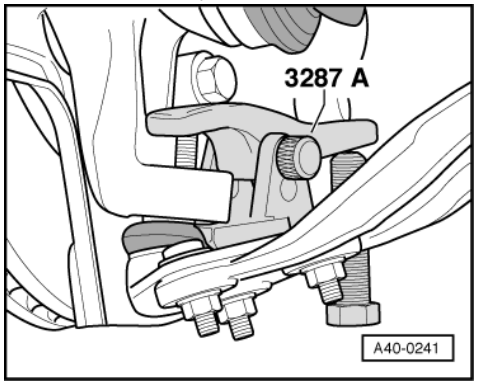
- -> Screw out bolts -arrows- at ball joint.



Audi S3:

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- -> Unscrew nut -arrow-.



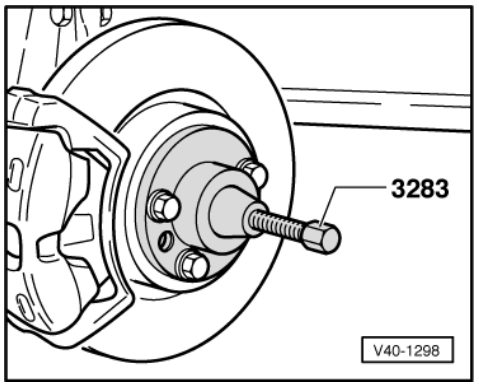
- -> Apply ball joint puller 3287 A to ball joint as shown.

Note:

Leave nut screwed several turns onto ball joint to protect thread.

- Press ball joint out of wheel bearing housing.

Attention:
On pressing out, ball joint is abruptly released from wheel bearing housing and can be a source of danger.



All models:

- -> Apply pressing-out tool 3283 and press drive shaft out of wheel bearing housing.

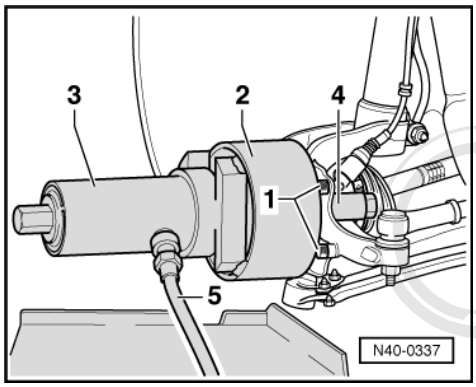
Note:

Ensure adequate clearance when pressing out drive shaft.

- Use wire to tie drive shaft to body.

Note:

Failure to tie drive shaft in position would damage inner joint.



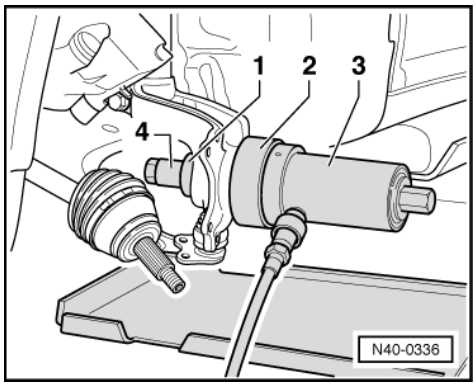
Pressing out wheel hub

Attention: Place engine/gearbox lifter V.A.G 1383

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- -> Insert thrust bolts -1- in wheel bearing housing.
- Fit bell -2-, hollow plunger cylinder -3- with pin and special nut -4-.
- Press wheel hub out of wheel bearing by way of pump action whilst holding tool.

1 - Thrust bolt E-15
2 - Bell E-40
3 - Hollow plunger cylinder HKZ-15
4 - Special nut E-8-214 and pin
5 - High-pressure hose with quick-release coupling

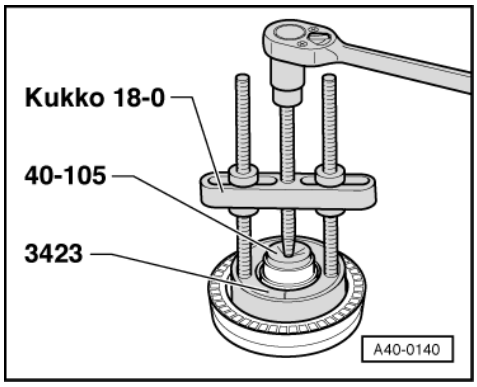


Pressing out wheel bearing

- Remove circlip.
- Use V.A.G 1459 B to extract wheel bearing as follows.
- -> Fit thrust pad -1- with collar facing bearing, thrust sleeve -2- with the four stepped inner diameters facing wheel bearing housing, hollow plunger cylinder -3- with pin and special nut -4-.

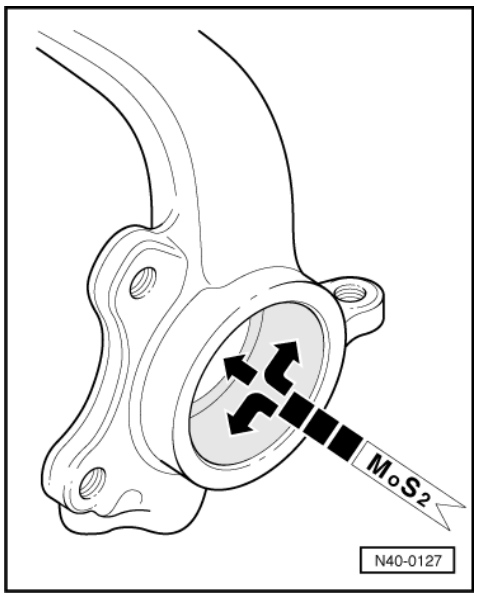
- Press out wheel bearing by way of pump action.

1 - Thrust pad E-5
2 - Thrust sleeve E-65-1
3 - Hollow plunger cylinder HKZ-15
4 - Special nut E-8-214 and pin



Detaching bearing inner race from wheel hub

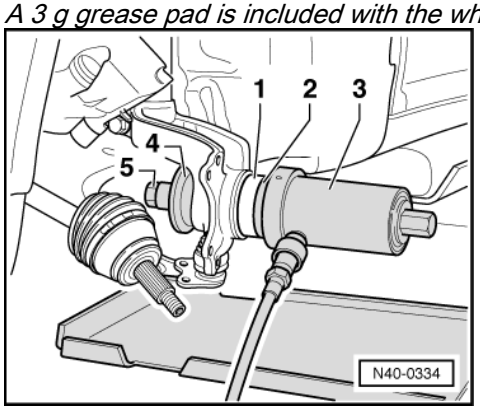
- -> Apply special tools shown and extract bearing inner race by turning spindle.



Pressing in wheel bearing

- -> Coat entire hole area in wheel bearing housing with Molypaste AOS 115 000 01.

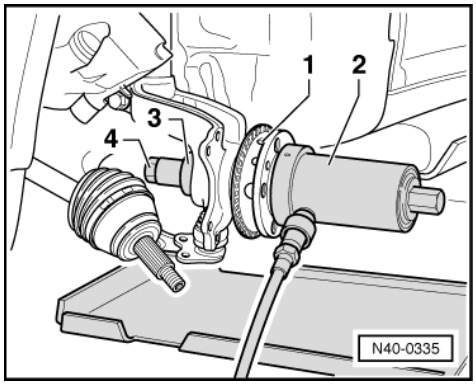
Note:
A 3 g grease pad is included with the wheel bearing set.



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- -> Place wheel bearing -1-, thrust pad -2- (position collar in bearing) and hollow plunger cylinder -3- with pin in position at wheel bearing housing.
- Fit thrust pad -4- with broad collar facing wheel bearing housing and special nut -5- from inside.
- Press in wheel bearing by way of pump action.
- Use pointed-nose pliers to insert circlip.

1 - Wheel bearing
2 - Thrust pad E-13-1
3 - Hollow plunger cylinder HKZ-15
4 - Thrust pad E-10
5 - Special nut E-8-214 and pin



Pressing in wheel hub

- -> Place wheel hub -1- and hollow plunger cylinder -2- with pin in position at wheel bearing.
- Fit special nut -4- and thrust pad -3- with collar facing special nut from inside.
- Press in wheel hub by way of pump action.

1 - Wheel hub
2 - Hollow plunger cylinder HKZ-15
3 - Thrust pad E-5
4 - Special nut E-8-214 and pin

Perform further installation in reverse order, paying attention to the following:

- Insert drive shaft in wheel bearing housing.
- Install ball joint => Page 34 .
- Secure drive shaft.
  - Procedure for tightening twelve-point nut => Page 108
  - Procedure for tightening hexagon collared bolt => Page 109

- Fit brake caliper.

=> Brake System; Repair Group 46

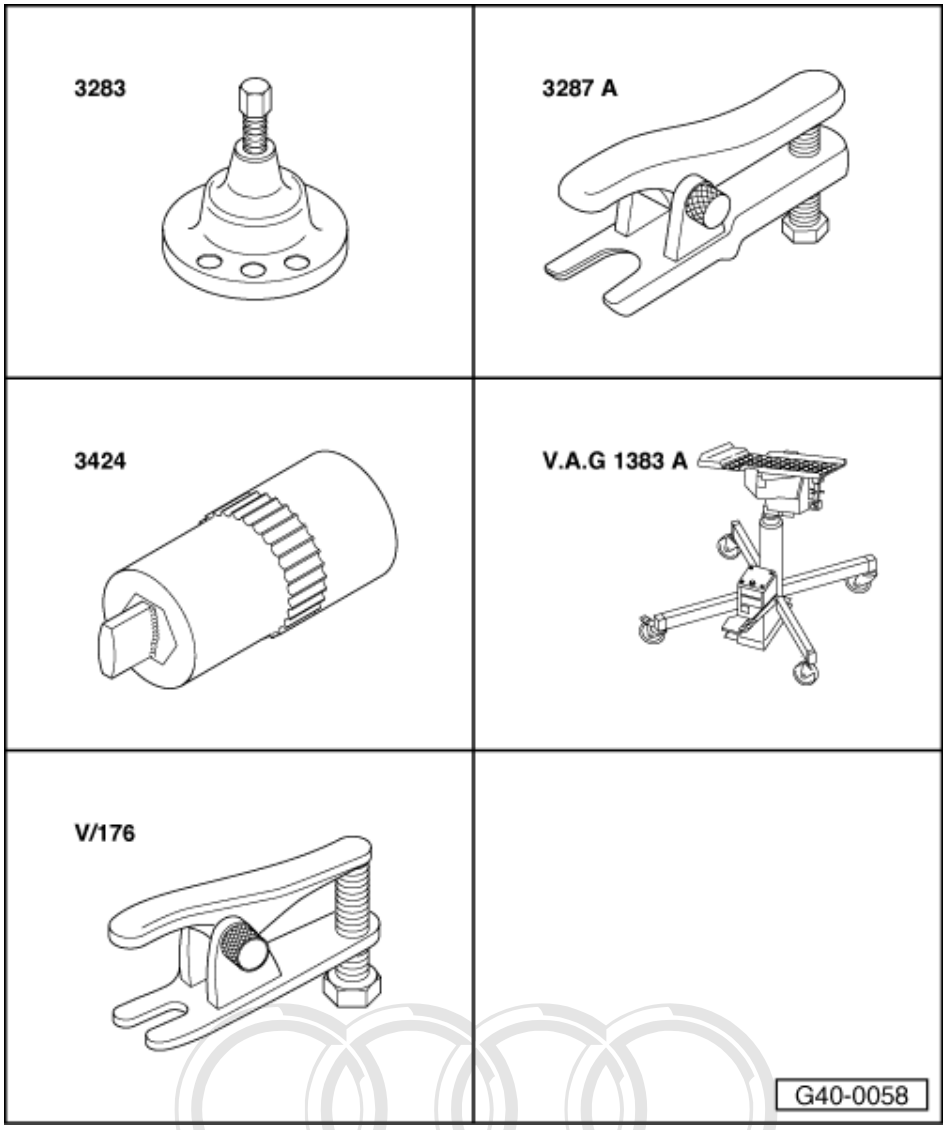
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Tightening torque

Component	Nm
Connecting link to suspension strut (4WD)	90 1)

1) Replace nut

2.5 - Removing and installing wheel bearing housing



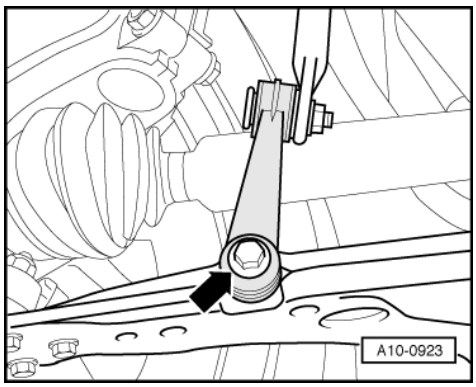
Special tools and workshop equipment required

- Pressing-out tool 3283
- Ball joint puller 3287 A
- Spreader tool 3424
- Engine/gearbox lifter V.A.G 1383 A
- Ball joint puller Matra V/176

Removing

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- Unfasten drive shaft bolted joint on wheel end.
  - Procedure for unfastening twelve-point nut => Page 108
  - Procedure for slackening off hexagon collared bolt => Page 109
- Remove wheel.

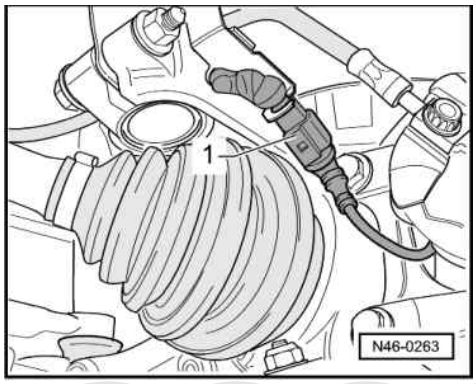


Front-wheel drive vehicles:

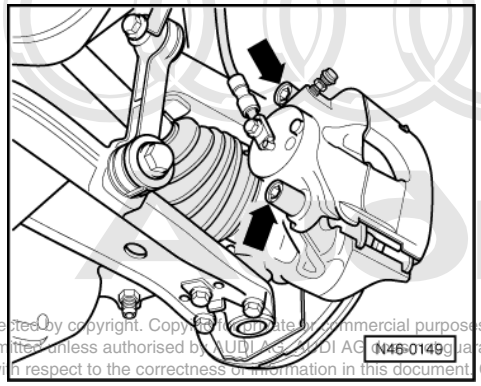
- -> Unscrew connecting link from wishbone -arrow-.

All models:

- Pull out spring clip of holder and disengage brake hose.
- Disengage speed sensor wire from suspension strut.



- -> Unplug connector -1- of brake pad wear indicator at left brake.



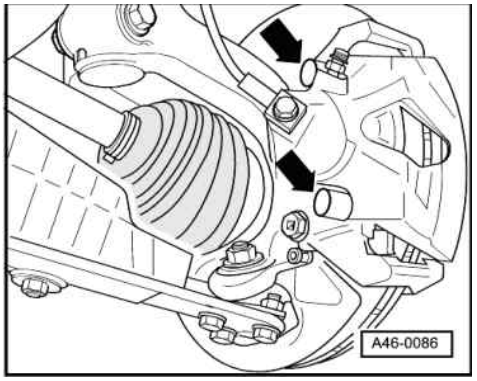
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Vehicles with brake caliper FS 3:

- Detach caps.
- -> Screw out guide pins -arrows-.
- Detach brake caliper and hang up with piece of wire.

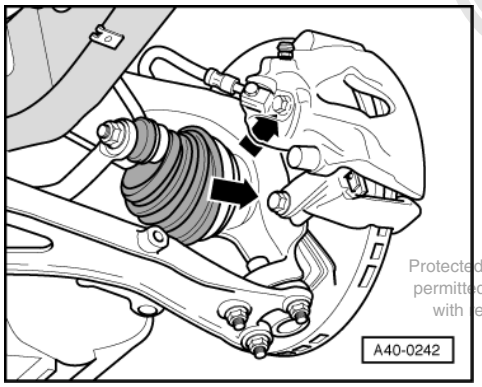
Note:

Brake hose/pipe is never to be twisted or kinked.



Vehicles with brake caliper FN 3:

- -> Detach caps -arrows-.



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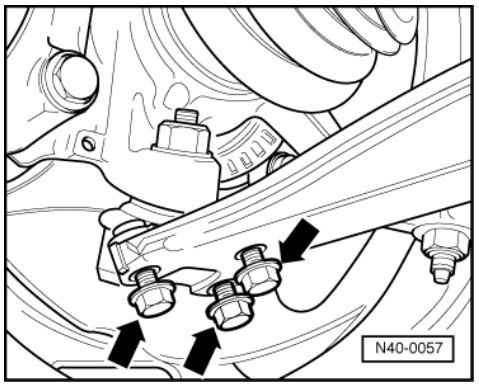
- -> Screw out bolts -arrows-.
- Detach brake caliper and hang up with piece of wire.

Note:

Brake hose/pipe is never to be twisted or kinked.

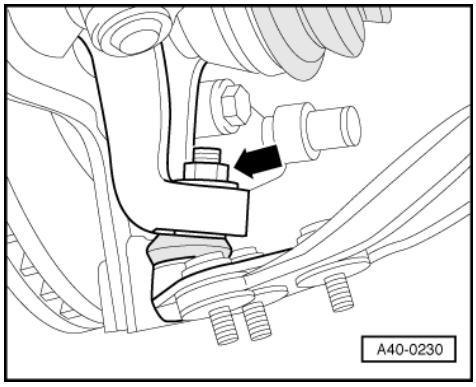
All models:

- Screw out cross-head bolt for brake disc and detach brake disc.
- Remove brake disc splash plate.



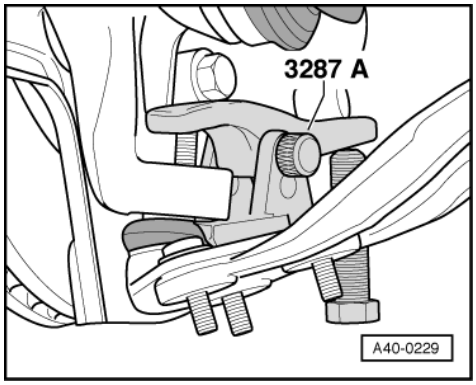
Audi A3:

- -> Screw out bolts -arrows- at ball joint.



Audi S3:

- -> Unscrew nut -arrow-.



- -> Apply ball joint puller 3287 A to ball joint as shown.

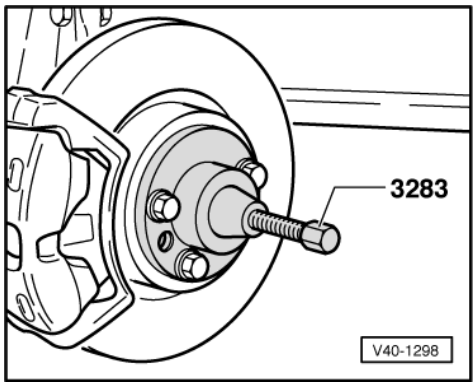
Note:

Leave nut screwed several turns onto ball joint to protect thread.

- Press ball joint out of wheel bearing housing.

Attention:
On pressing out, ball joint is abruptly released from wheel bearing housing and can be a source of danger.

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All models:

- -> Apply pressing-out tool 3283 and press drive shaft out of wheel bearing housing.

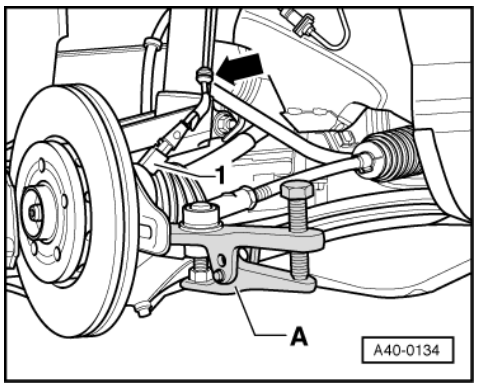
Note:

Ensure adequate clearance when pressing out drive shaft.

- Use wire to tie drive shaft to body.

Note:

Failure to tie drive shaft in position would damage inner joint.

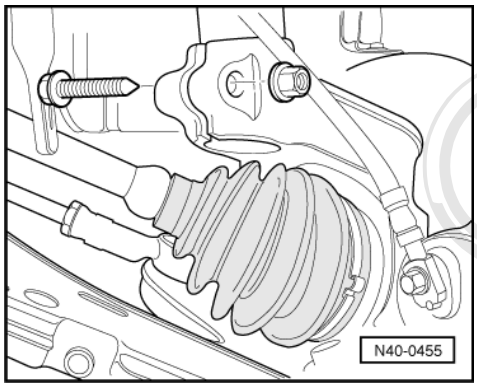


- Unscrew nut from track rod end.

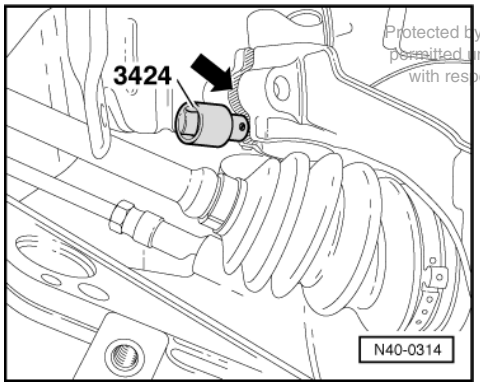
Notes:

- Leave nut screwed several turns onto track rod end to protect thread.
- Fig. shows Audi A3 vehicle.

- -> Use puller Matra V/176 -item A- to press track rod off steering arm.
- Unplug connector -1- of ABS speed sensor.



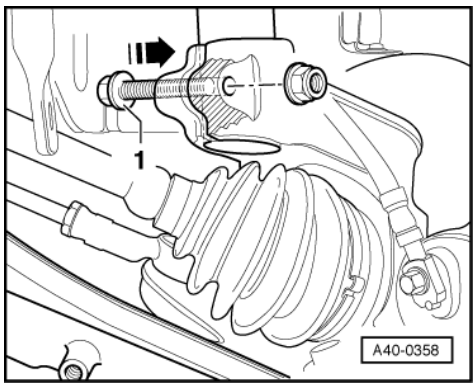
- -> Separate wheel bearing housing/suspension strut bolted joint.



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Attention:
Place engine/gearbox lifter V.A.G 1383

- -> Insert spreader tool 3424 in slot -arrow-.
- Turn ratchet handle through 90° and detach from spreader tool 3424.
- Detach wheel bearing housing downwards from shock absorber tube.
- When doing so, press brake disc by hand in direction of suspension strut to prevent shock absorber tube catching in hole of wheel bearing housing.



Installing

Install in reverse order, paying attention to the following:

- -> Fit new wheel bearing housing/suspension strut bolted joint.
  - Threaded end of bolt -1- faces in direction of travel -arrow-
- Install ball joint => Page 34 .
- Fit brake caliper.

=> Brake System; Repair Group 46

Tightening torques

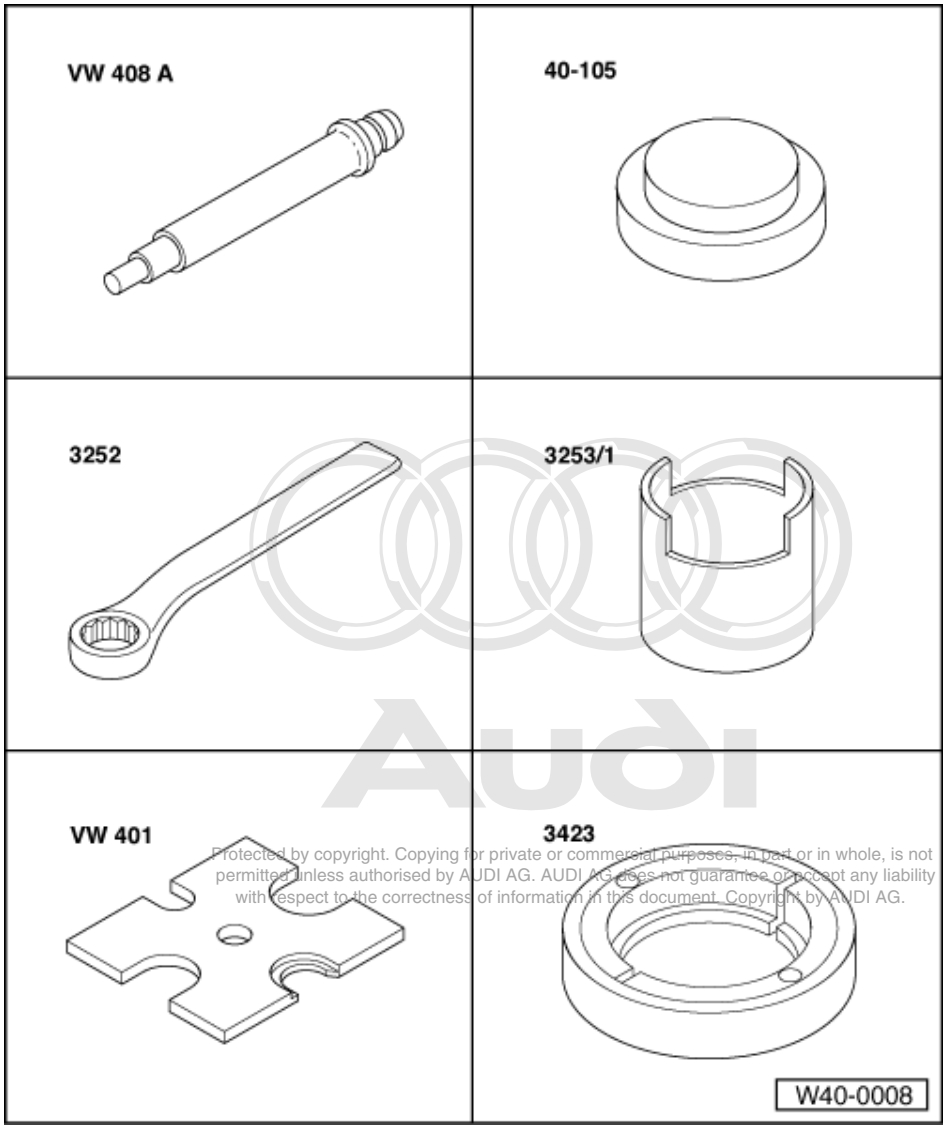
Component	Nm
Wheel bearing housing/shock absorber tube bolted joint	60 + 90° 1)2)
Track rod end to wheel bearing housing	45 1)2)
Connecting link to wishbone (FWD)	15 + 90° 1)2)

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

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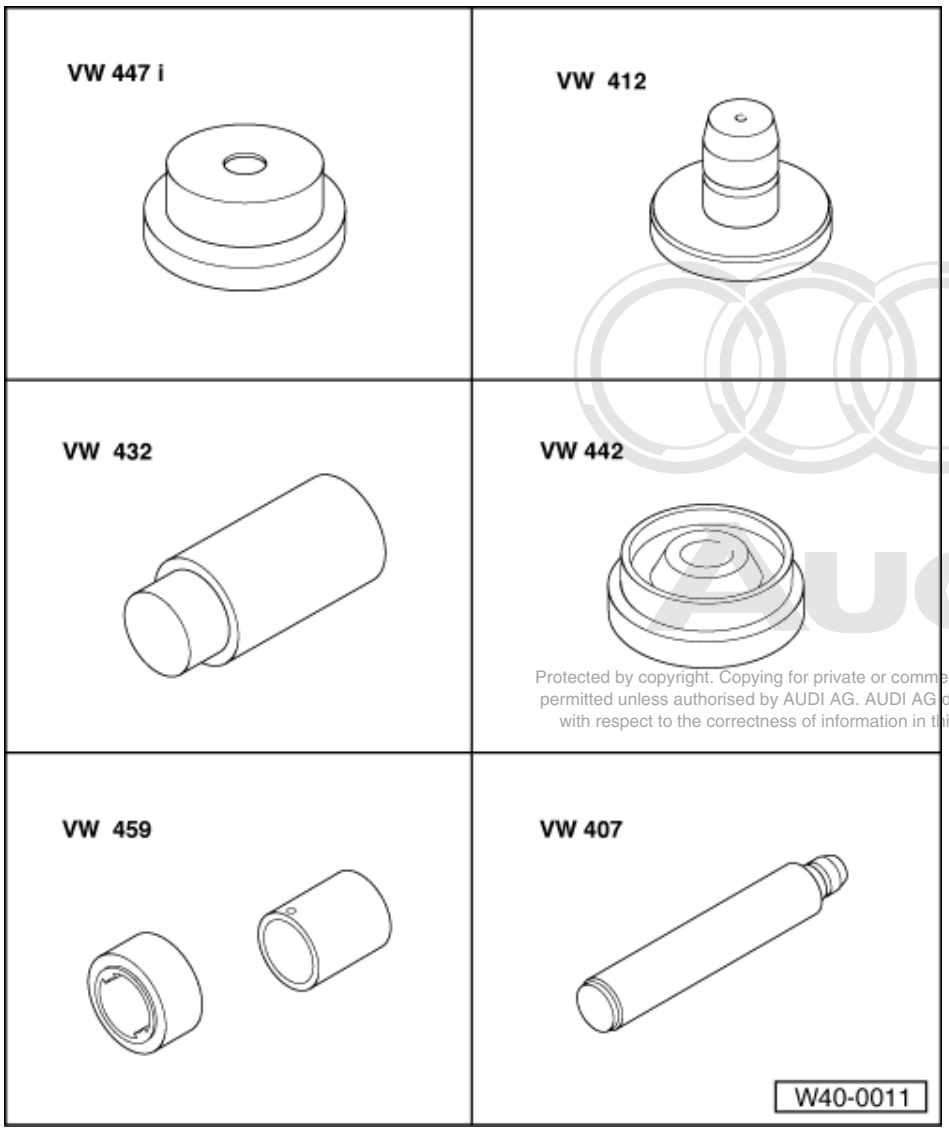
2.6 - Replacing front wheel bearing with wheel bearing housing removed



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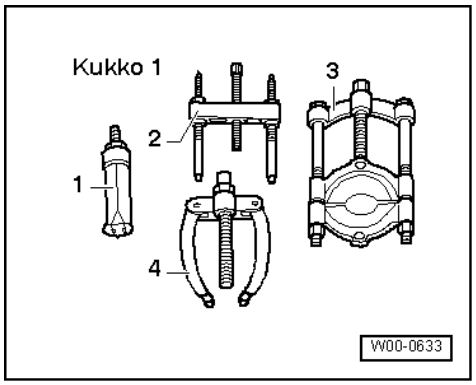
Special tools and workshop equipment required

- Press tool VW 408 A
- Thrust plate 40-105
- 46 mm ring spanner 3252
- Assembly device 3253/1
- Thrust plate VW 401
- Puller 3423

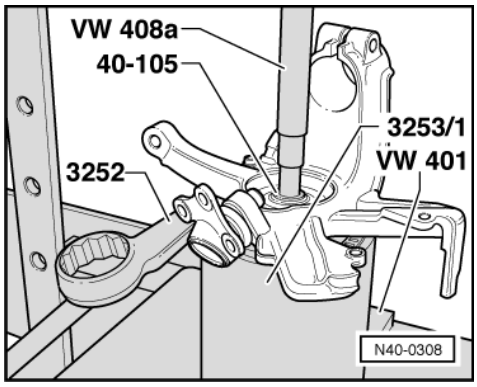


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- Thrust pad VW 447 i
- Press tool VW 412
- Thrust pad VW 432
- Thrust pad VW 442
- Pressing-out and pressing-in tool VW 459
- Press tool VW 407

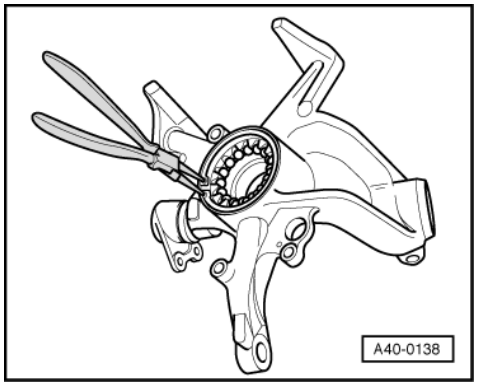


- 2 - Kukko 18/0 puller



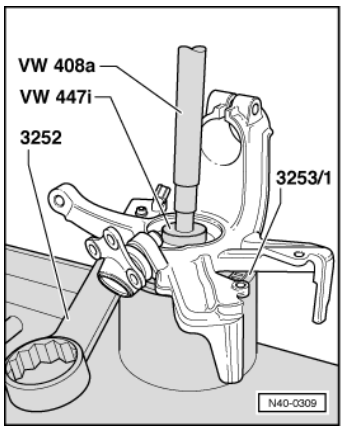
Pressing wheel hub out of wheel bearing housing

- -> Apply special tools shown and press out wheel hub.



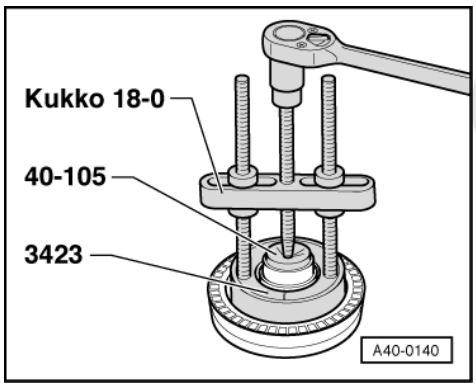
Pressing out wheel bearing

- -> Use commercially available circlip pliers to take out circlip.



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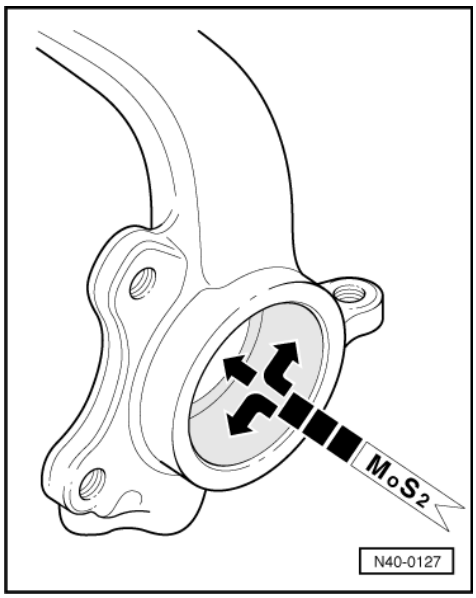
- -> Apply special tools shown and press wheel bearing out of wheel bearing housing.



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Detaching bearing inner race from hub

- -> Apply special tools shown and extract bearing inner race by turning spindle.

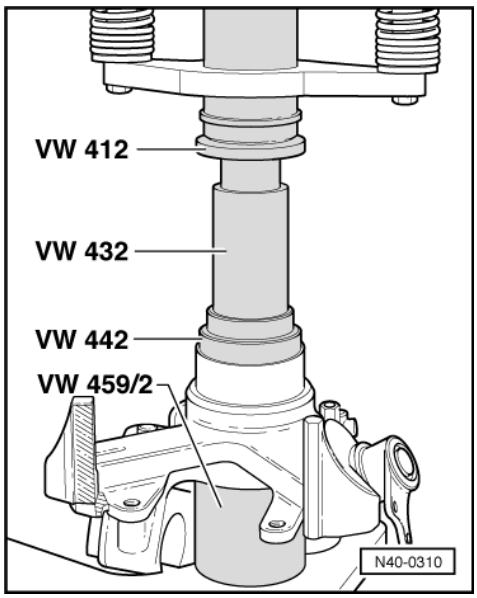


Pressing in wheel bearing

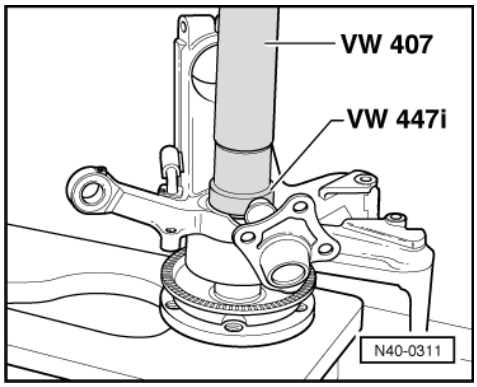
- -> Coat entire hole area in wheel bearing housing with Molypaste AOS 115 000 01.

Note:

A 3 g grease pad is included with the wheel bearing set.



- -> Apply special tools shown and press in wheel bearing.
- Use pointed-nose pliers to insert circlip.



Pressing wheel hub into wheel bearing

- -> Apply special tools shown and fit wheel hub in wheel bearing.

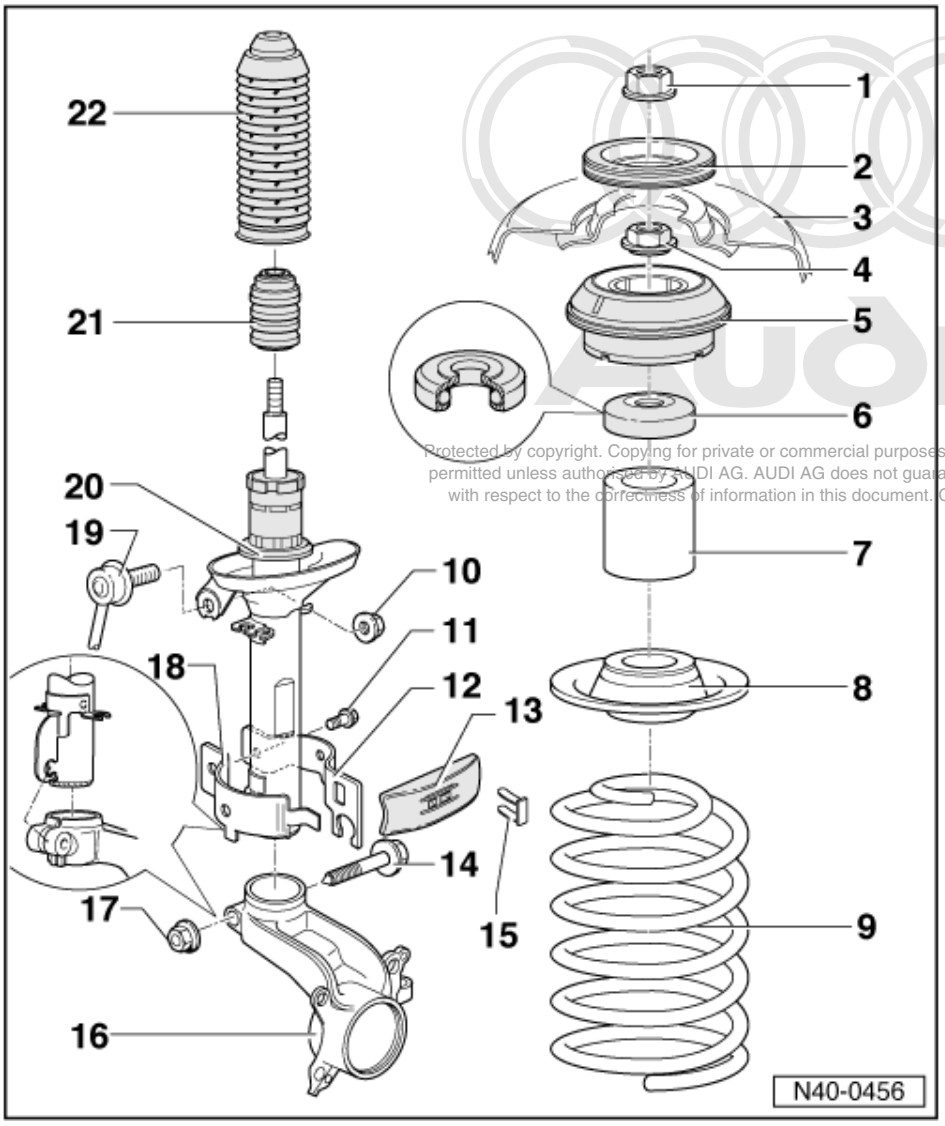
Note:

When pressing in wheel hub, make sure special tool rests on bearing inner race.

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3 - Exploded view of suspension strut components

3.1 - Exploded view of suspension strut components



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1 **Nut, 60 Nm**
- Self-locking
- Always replace after removing

2 **Stop plate**

3 **Suspension strut holder**

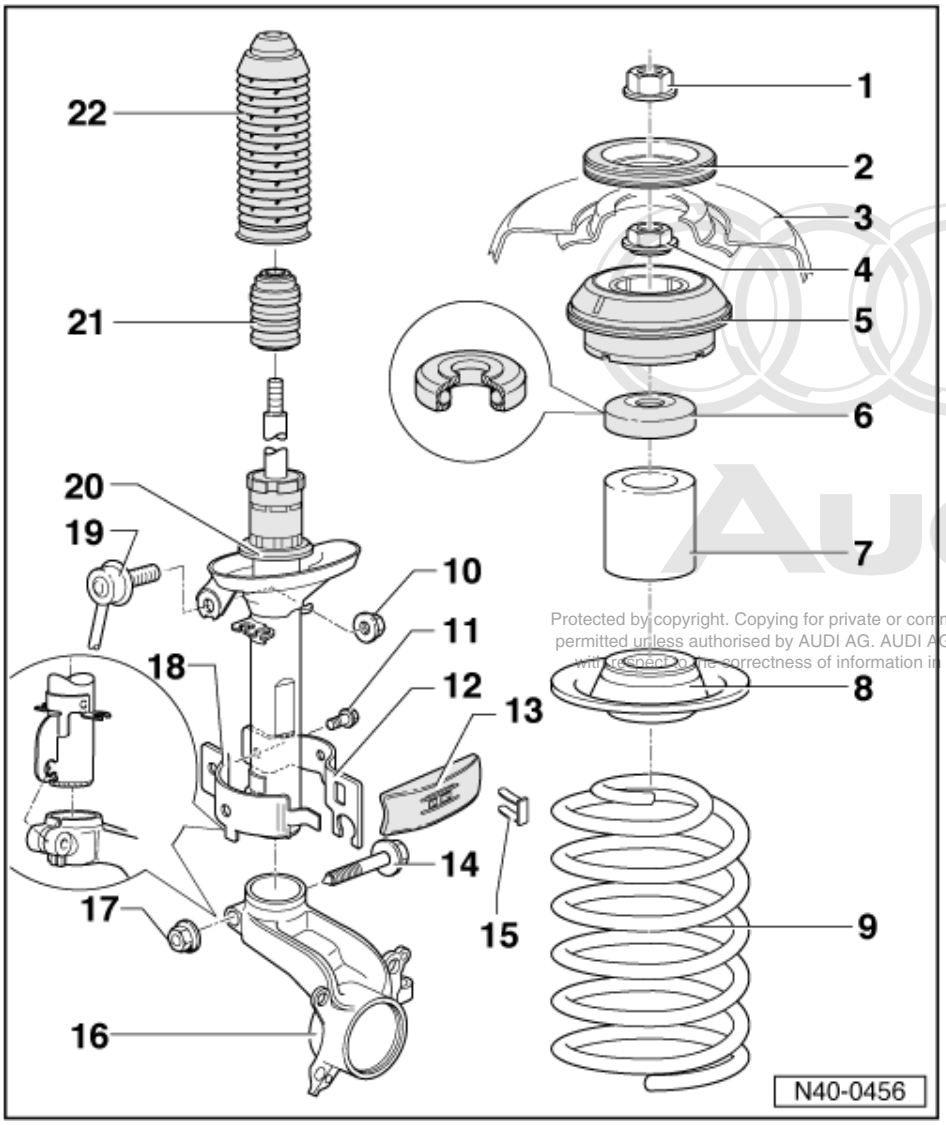
4 **Nut, 60 Nm**

5 **Suspension strut bush**
- Coat with assembly lubricant G 294 421 A1

6 **Deep-groove axial ball bearing**

7 **Bush**
- For vehicles with heavy-duty running gear only; distinguishing feature => vehicle data sticker, Page 1

8 **Spring plate**



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9 Coil spring

- Assignment to vehicle => Vehicle data sticker, Page 1
- Heed colour coding
- Check for paint damage and eliminate any damage
- Removing and installing
  =>Page 102

10 Nut - 50 Nm + further 90° (1/4) turn

- Self-locking
- Always replace after removing

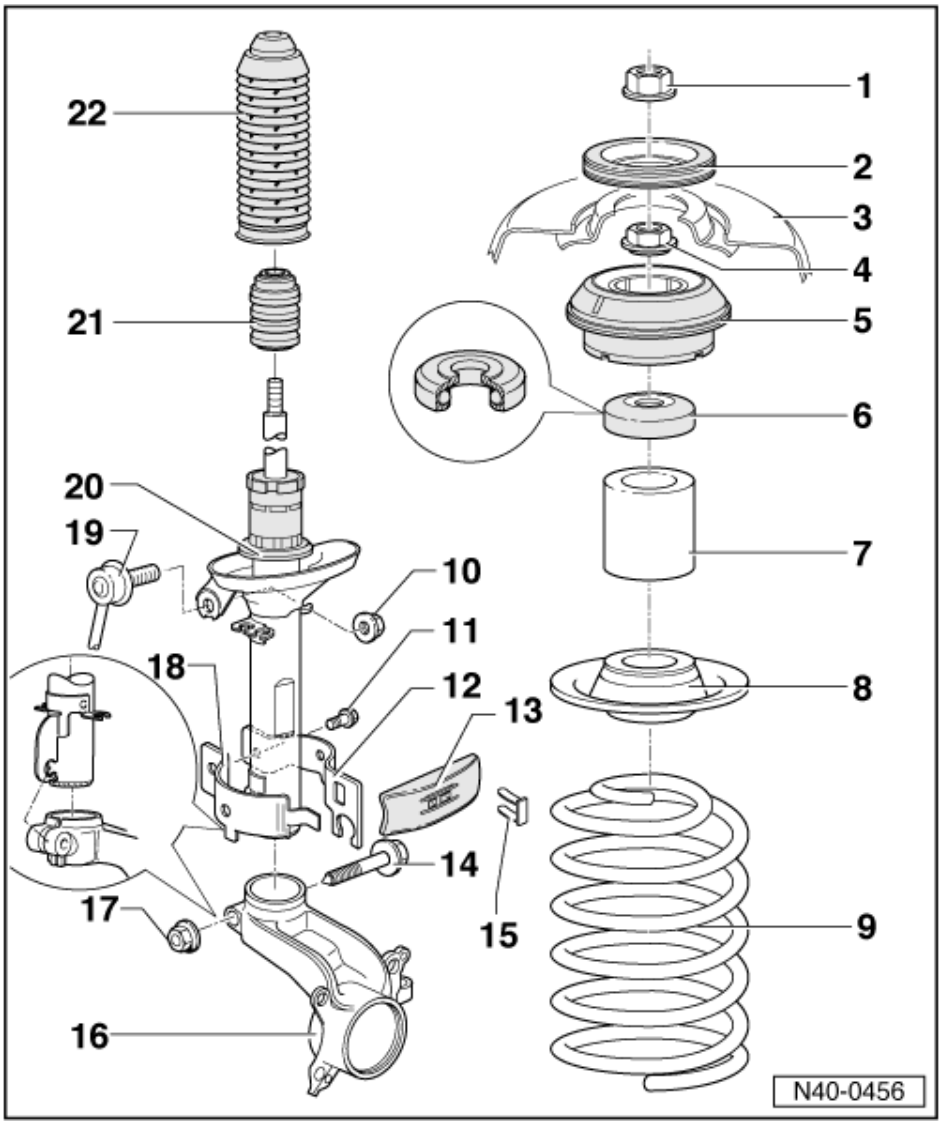
11 Bolt, 10 Nm

12 Bracket

- Not always fitted

13 Heat shield

- Not always fitted



14 Bolt

- Always replace together with nut -Item 17 - after removing
- Threaded end of bolt must face in direction of travel

15 Clip

16 Wheel bearing housing

- Separating from suspension strut => Fig. 1

17 Nut - 60 Nm + further 90° (1/4) turn

- Self-locking
- Always replace together with bolt -Item 14 - after removing

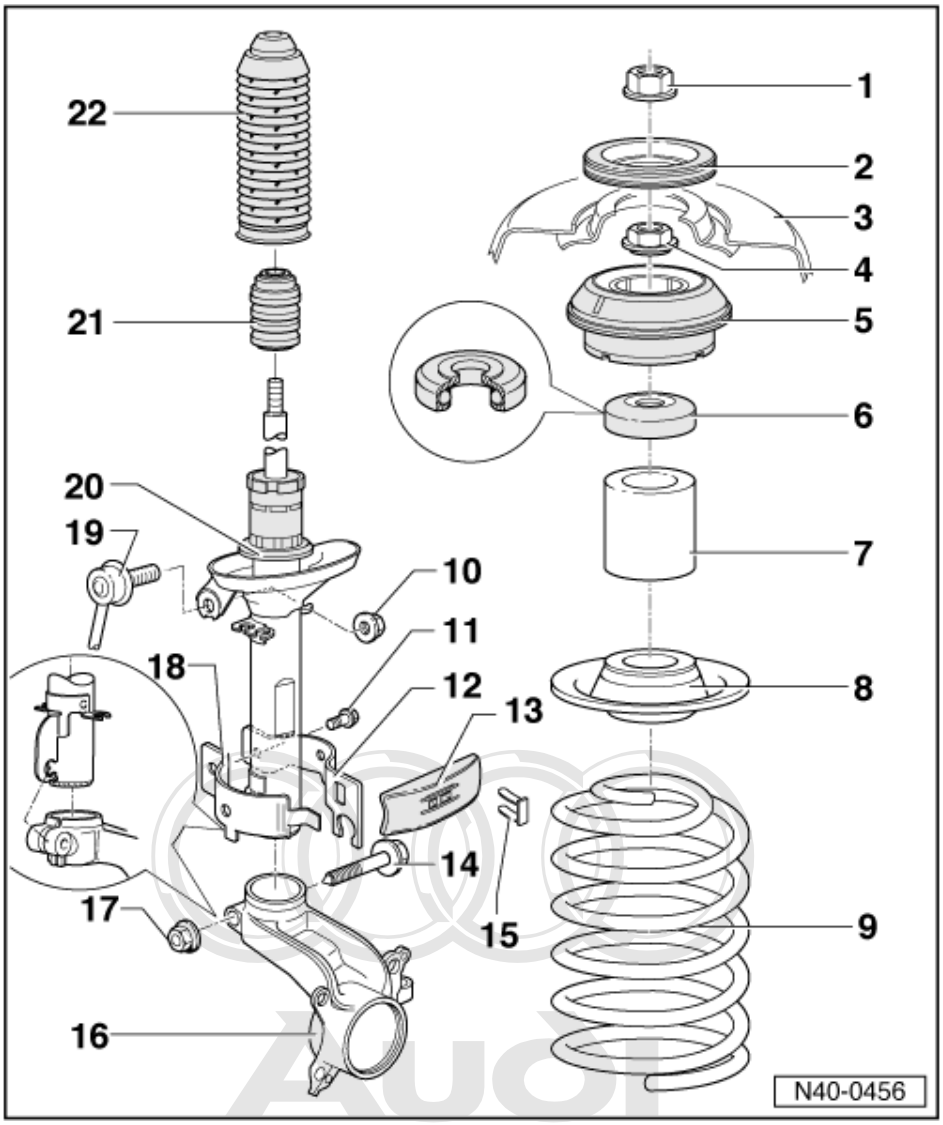
18 Bracket

- Not always fitted

19 Connecting link

- Fig. shows version for 4WD vehicles

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20 Shock absorber

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- Only to be replaced in pairs up to vehicle ident no. 8L_YA_117 500 on Audi S3
- Assignment to vehicle => Vehicle data sticker, Page 1
- Checking shock absorber for leaks => Page 7
- Checking shock absorber following removal => Page 8
- Removing and installing
  =>Page 102
- Before scrapping defective shock absorbers, always ensure gas release and draining => Page 5

21 Buffer stop

22 Protective sleeve

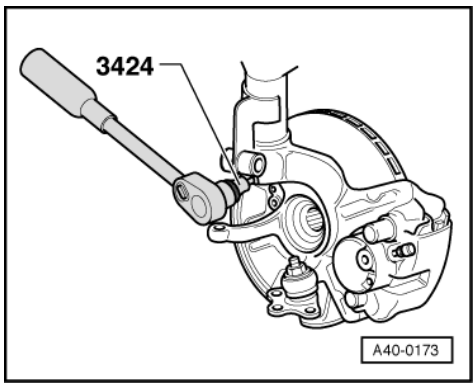
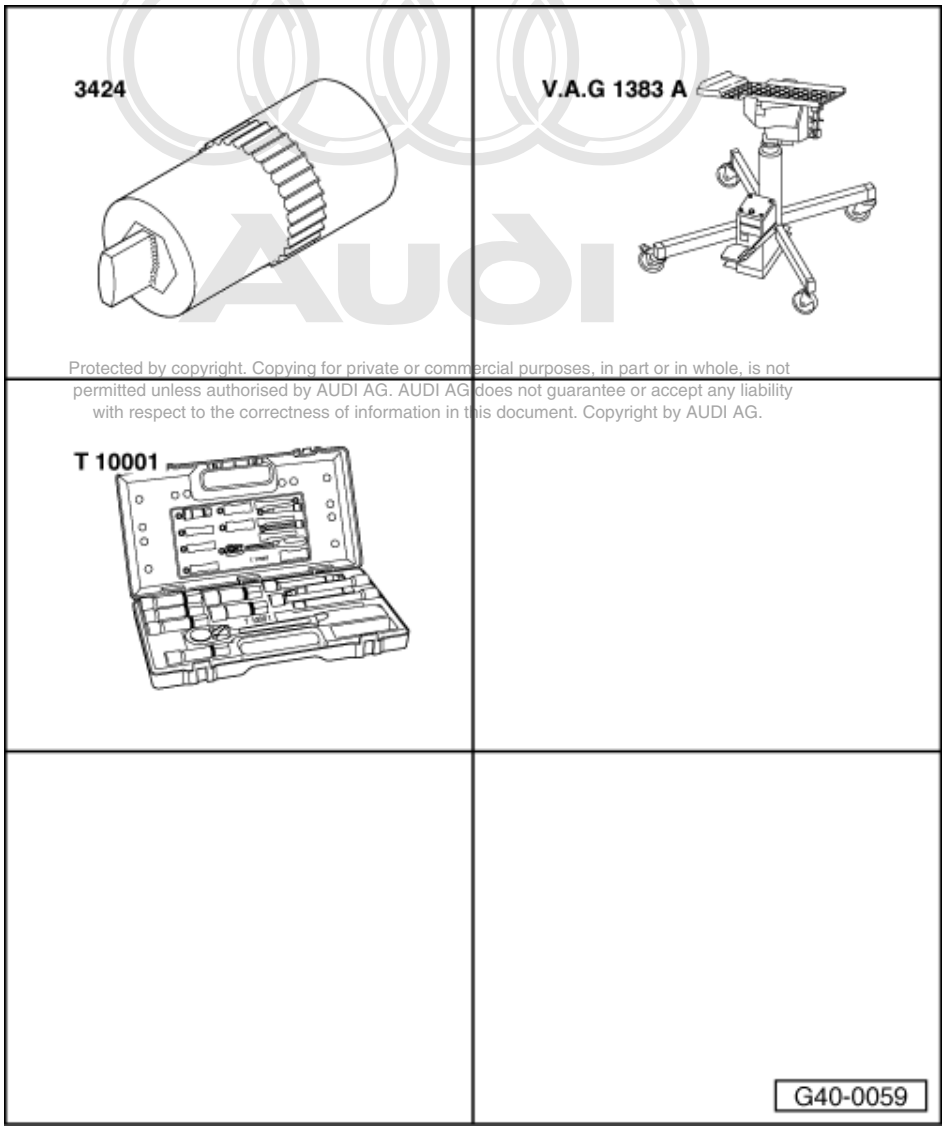


Fig.1-> Separating suspension strut from wheel bearing housing

- Insert spreader tool 3424 in slot at wheel bearing housing.
- Turn ratchet handle through 90° and detach from spreader tool 3424.
- Detach wheel bearing housing downwards from shock absorber tube.

3.2 - Removing and installing suspension strut



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Special tools and workshop equipment required

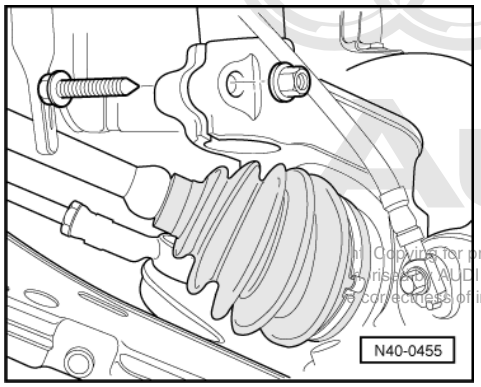
- Spreader tool 3424
- Engine/gearbox lifter V.A.G 1383 A
- Shock absorber set T10001

Removing

- Remove wheel.
- Unscrew connecting link for anti-roll bar on either side of vehicle.
- Pull out spring clip of holder and disengage brake hose.
- Disengage speed sensor wire from suspension strut.

Right suspension strut

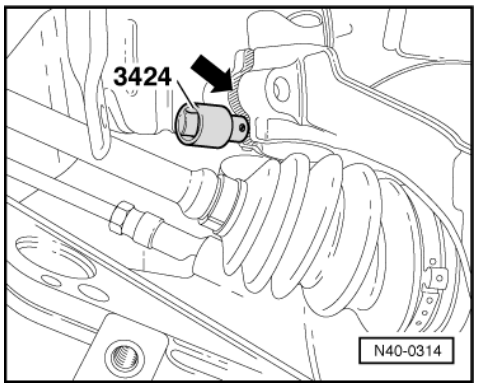
- Remove noise insulation.
- Unscrew right drive shaft from gearbox flange.
- Use wire to tie drive shaft to body.



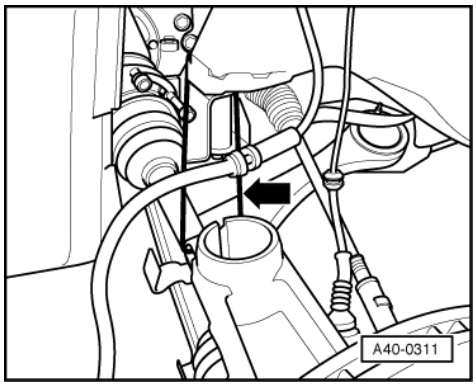
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Both sides (continued):

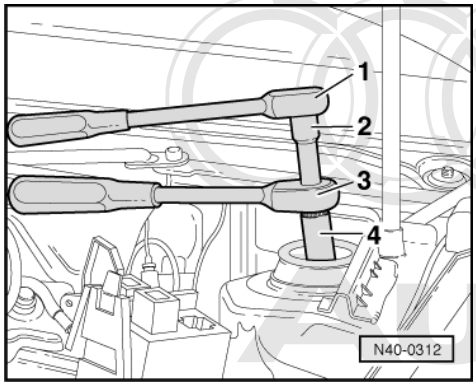
- -> Separate wheel bearing housing/suspension strut bolted joint.



- -> Insert spreader tool 3424 in slot -arrow-.
- Turn ratchet handle through 90° and detach from spreader tool 3424.
- Detach wheel bearing housing downwards from shock absorber tube.
- When doing so, press brake disc by hand in direction of suspension strut to prevent shock absorber tube catching in hole of wheel bearing housing.



- -> Use wire -arrow- to tie wheel bearing housing to subframe.

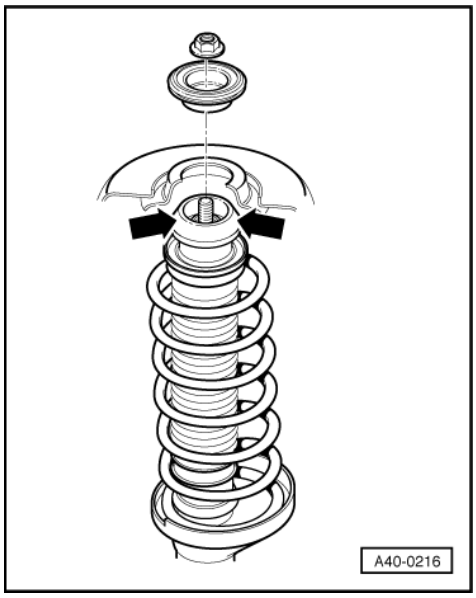


- -> Unscrew hexagon nut for securing shock absorber at top.

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1 - Ratchet handle (commercially available)
2 - T 10001/8
3 - T 10001/11
4 - T 10001/5

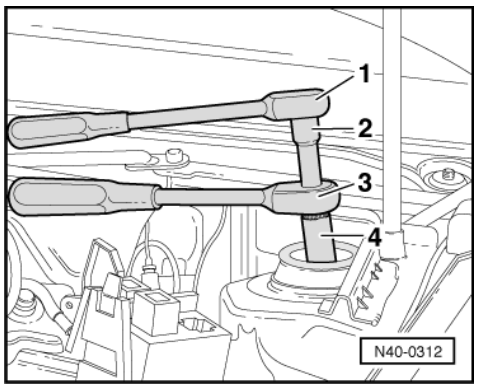
- Take out suspension strut.



Installing

Install in reverse order, paying attention to the following:

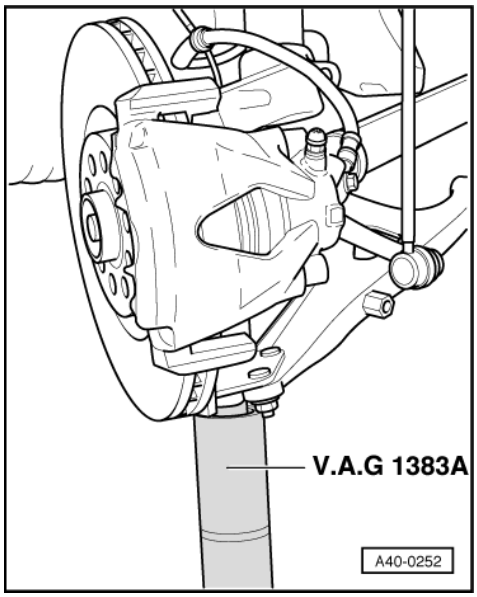
- -> Prior to insertion in suspension strut holder, coat suspension strut bush -arrows- with assembly lubricant G 294 421 A1.



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- Insert suspension strut in suspension strut holder.
- -> Tighten hexagon nut for securing shock absorber at top.

1 - Ratchet handle (commercially available)
2 - T 10001/8
3 - T 10001/11
4 - T 10001/5



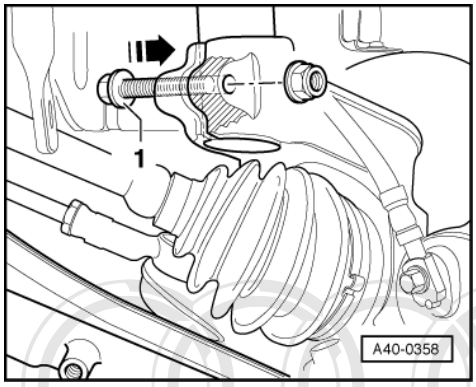
- -> Place suspension strut in position at wheel bearing housing.
- Remove wire at wheel bearing housing.
- Use engine/gearbox lifter V.A.G 1383 A to carefully raise wheel bearing housing until suspension strut/wheel bearing housing bolt can be inserted.

Note:

Do not press on ball end with engine/gearbox lifter.

- When doing so, press brake disc by hand in direction of suspension strut to prevent shock absorber tube catching in hole of wheel bearing housing.
  - Shock absorber must be fitted as far as possible into wheel bearing housing

- Take spreader tool 3424 out of wheel bearing housing.



- -> Fit new wheel bearing housing/suspension strut bolted joint.
  - Threaded end of bolt -1- faces in direction of travel -arrow-

Right suspension strut

- Screw on right drive shaft at gearbox flange => Page 113 .

Tightening torques

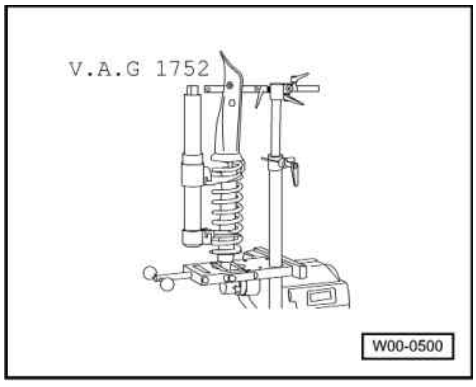
Component	Nm
Hexagon nut for securing shock absorber at top	60 1)
Wheel bearing housing/shock absorber tube bolted joint	60 + 90° 1)2)
Connecting link to wishbone (FWD)	15 + 90° 1)2)
Connecting link to suspension strut (4WD)	50 + 90° 1)2)

1) Replace nuts/bolts

2) 90°corresponds to quarter turn

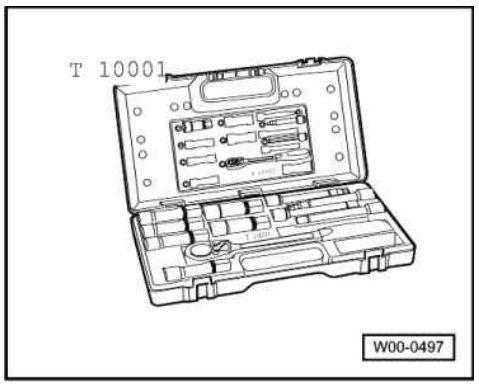
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3.3 - Removing and installing coil spring



Special tools and workshop equipment required

- Suspension strut tensioner V.A.G 1752

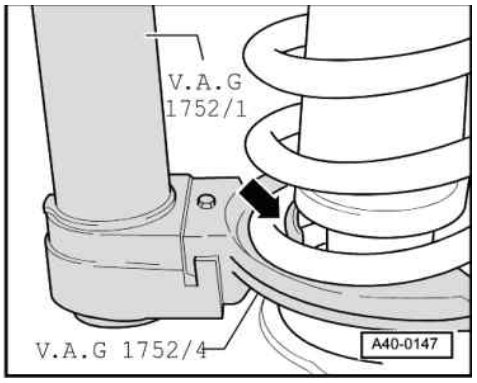


- Shock absorber set T10001

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Notes:

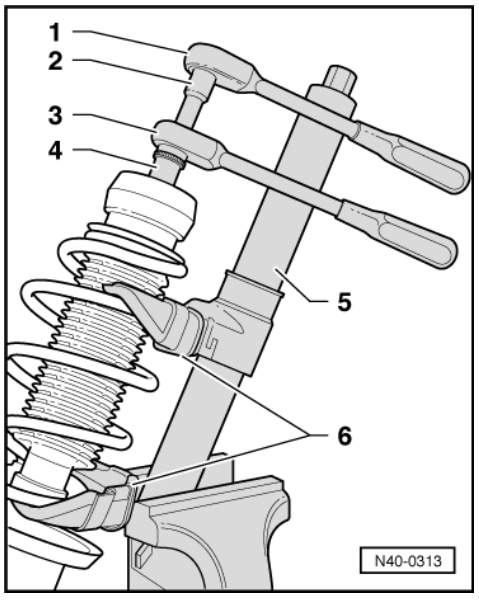
- Assignment of spring to vehicle => Vehicle data sticker, Page 1
- Same version must always be fitted on left and right.
- If different versions are fitted in vehicle, springs/shock absorbers must be replaced in pairs.



Removing

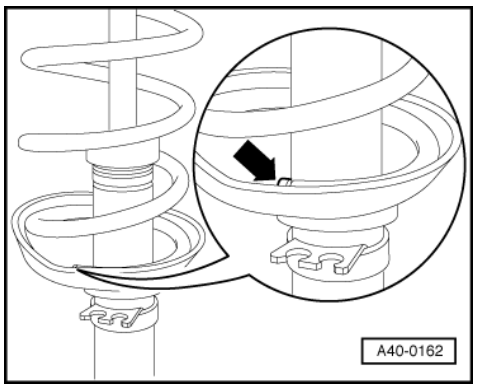
- Suspension strut removed => Page 102

- -> Apply tensioner V.A.G 1752/1 with spring holder insert V.A.G 1752/4 to coil spring.
- Make sure coil spring is correctly positioned in adapter V.A.G 1752/4 -arrow-.



- -> Pre-tension coil spring with tensioner -V.A.G 1752/1- until upper spring plate is free.
- Unscrew hexagon nut from piston rod.
- Detach components of suspension strut and coil spring with tensioner V.A.G 1752/1.

1 - Ratchet handle (commercially available)
2 - T 10001/8
3 - T 10001/11
4 - T 10001/5
5 - V.A.G 1752/1 Spring tensioner
6 - V.A.G 1752/4 Holder



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Installing

Install in reverse order, paying attention to the following:

- -> Position coil spring with tensioner V.A.G 1752/1 on spring seat.
  - End of spring winding must make contact with stop -arrow-

Component	Nm
Hexagon nut for securing shock absorber at top	60 1)

1) Replace nut

4 - Servicing front drive shafts

4.1 - Servicing front drive shafts

General:

Wheel bearings are not to be subjected to load after unfastening drive shaft bolted joint on wheel end.

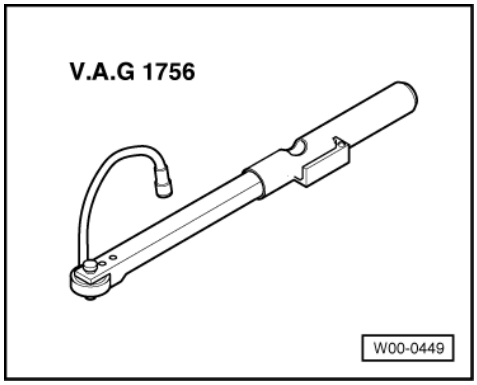
Subjecting the wheel bearings to the dead weight of the vehicle would cause wheel bearing damage and shorten their service life. Attention is therefore to be paid to the following:

- Procedure for unfastening twelve-point nut => Page 108
- Procedure for slackening off hexagon collared bolt => Page 109

Never move vehicles without drive shaft fitted, as otherwise wheel bearing damage will result. Should it nevertheless become necessary to move the vehicle, always heed the following:

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

4.2 - Unfastening and tightening twelve-point nut of drive shaft bolted joint



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Special tools and workshop equipment required

- Angle measuring wrench V.A.G 1756

Unfastening twelve-point nut

- To avoid wheel bearing damage, do not unfasten twelve-point nut by more than 90°with vehicle still standing on its wheels.
- Raise vehicle such that wheels are off ground.
- Have second mechanic press brake.
- Unscrew twelve-point nut.

Tightening twelve-point nut on the following vehicles: 1.6 l; 1.8 l FWD (92 kW, 110 kW, 132 kW); 1.9 l TDI (66 kW, 81 kW)

- Replace twelve-point nut.
- Remove any paint remnants and/or corrosion at thread and splines of outer joint.
- Before fitting drive shaft, lubricate the following locations with polycarbamide grease, part no. G 052 142 A2:

  - Splines of outer joint
  - Thread of outer joint
  - Contact surface of twelve-point nut

  Insert outer joint as far as possible into wheel hub splines.
  Pull outer joint with twelve-point nut into wheel hub until it makes contact with wheel bearing.
  Lower vehicle, making sure that wheels do not as yet come into contact with ground.

Note:

Wheels must not be in contact with ground when tightening drive shaft as otherwise wheel bearing could be damaged.

- Have second mechanic press brake.
- Tighten twelve-point nut to 200 Nm.
- Slacken off twelve-point nut by 360°(one turn).
- Tighten twelve-point nut to 50 Nm.
- Set vehicle down on its wheels.
- Give twelve-point nut further 60° turn.

Tightening twelve-point nut on the following vehicles: 1.8 l 4WD (110 kW, 132 kW, 154 kW, 165 kW); 1.9 l TDI FWD and 4WD (74 kW, 96 kW)

- Replace twelve-point nut.
- Remove any paint remnants and/or corrosion at thread and splines of outer joint.
- Before fitting drive shaft, lubricate the following locations with polycarbamide grease, part no. G 052 142 A2:
  - Splines of outer joint
  - Thread of outer joint
  - Contact surface of twelve-point nut
- Insert outer joint as far as possible into wheel hub splines.

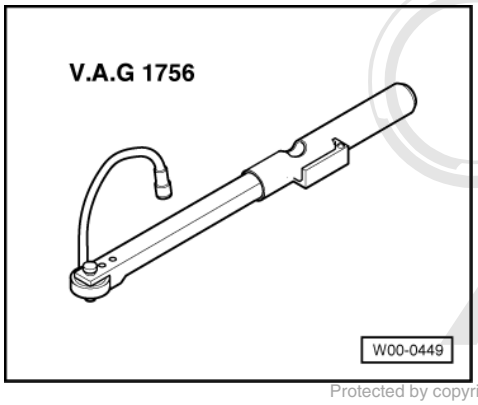
- Pull outer joint with twelve-point nut into wheel hub until it makes contact with wheel bearing.
- Lower vehicle, making sure that wheels do not as yet come into contact with ground.

Note:

Wheels must not be in contact with ground when tightening drive shaft as otherwise wheel bearing could be damaged.

- Have second mechanic press brake.
- Tighten twelve-point nut to 190 Nm.
- Set vehicle down on its wheels.
- Give twelve-point nut further 90° turn.

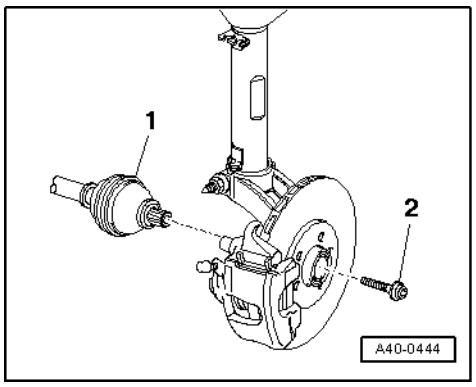
4.3 - Slackening off and tightening collared bolt of drive shaft bolted joint



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Special tools and workshop equipment required

- Angle measuring wrench V.A.G 1756



Slackening off collared bolt

- To avoid wheel bearing damage, do not slacken off collared bolt by more than 90°with vehicle still standing on its wheels.
- Raise vehicle such that wheels are off ground.
- Have second mechanic press brake.
- -> Screw out collared bolt -2-.

Fitting collared bolt

- Replace hexagon collared bolt.
- Before fitting drive shaft, lubricate the following locations with polycarbamide grease, part no. G 052 142 A2:
  - Splines of outer joint
  - Wheel hub splines

  - Resting surface of hexagon collared bolt head
- Lower vehicle, making sure that wheels do not as yet come into contact with ground.

Note:

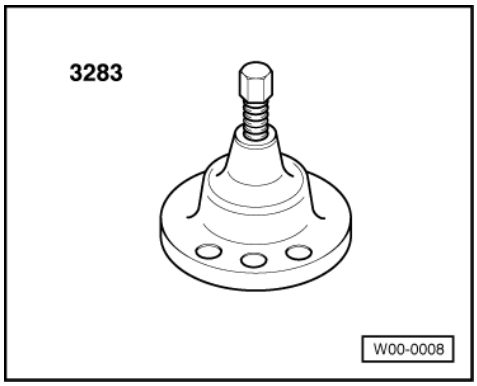
Wheels must not be in contact with ground when tightening drive shaft as otherwise wheel bearing could be damaged.

- Have second mechanic press brake.
- Tighten hexagon collared bolt to 240 Nm.
- Set vehicle down on its wheels.
- Give hexagon collared bolt further 90° turn.

- Slacken off hexagon collared bolt again by 90°.
- Raise vehicle.
- Slacken off hexagon collared bolt by a further 90°.
- Have second mechanic press brake.
- Tighten hexagon collared bolt to 240 Nm.
- Set vehicle down on its wheels.
- Give hexagon collared bolt further 90° turn.

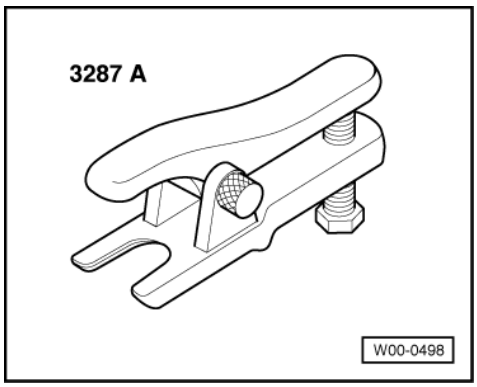
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4.4 - Removing and installing drive shafts



Special tools and workshop equipment required

- Pressing-out tool 3283

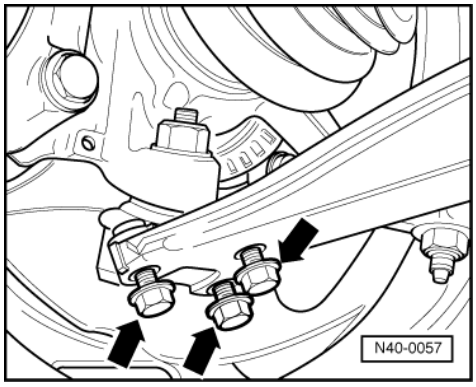


- Ball joint puller 3287 A (Audi S3 only)

Removing

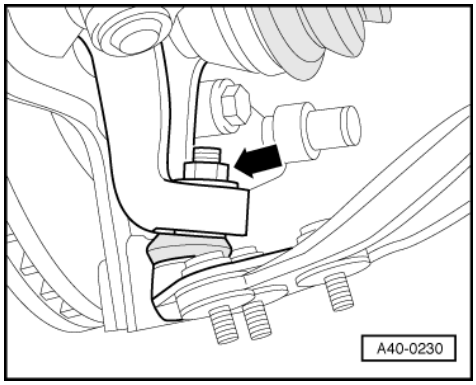
- Unfasten drive shaft bolted joint on wheel end.
  - Procedure for unfastening twelve-point nut => Page 108
  - Procedure for slackening off hexagon collared bolt => Page 109
- Remove wheel.

- Unscrew drive shaft from gearbox flange.



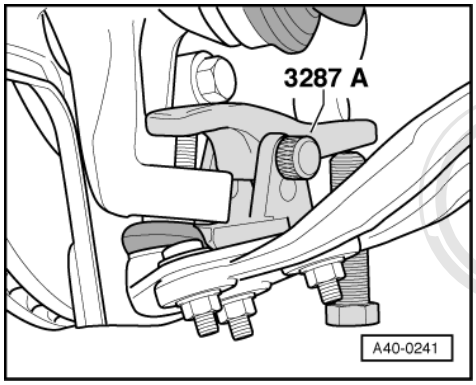
Audi A3:

- -> Screw out bolts -arrows- at ball joint.



Audi S3:

- -> Unscrew nut -arrow-.



- -> Apply ball joint puller 3287 A to ball joint as shown.

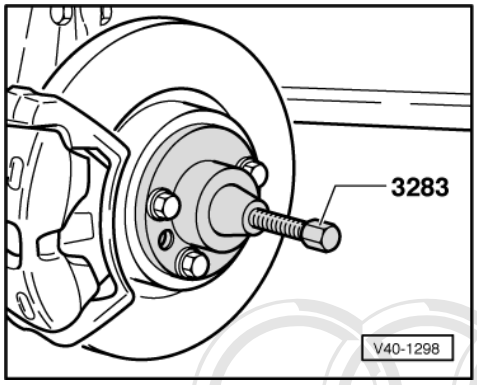
Note:

Leave nut screwed several turns onto ball joint to protect thread.

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- Press ball joint out of wheel bearing housing.

Attention:
On pressing out, ball joint is abruptly released from wheel bearing housing and can be a source of danger.



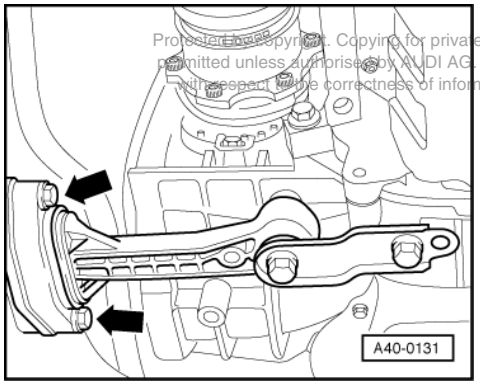
All models:

- -> Apply pressing-out tool 3283 and press drive shaft out of wheel bearing housing.

Note:

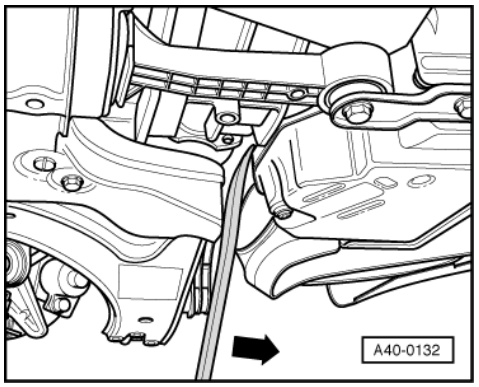
Ensure adequate clearance when pressing out drive shaft.

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Vehicles with automatic gearbox:

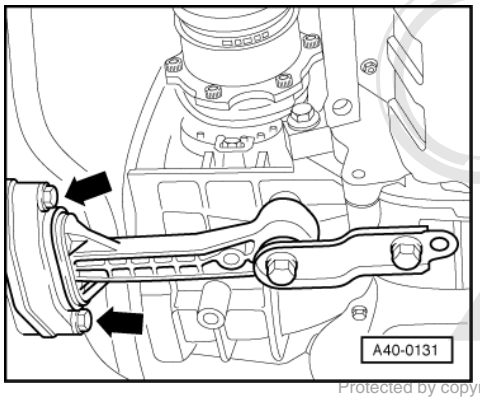
- -> Screw out bolts -arrows-.



- -> Use tyre iron to press engine/gearbox assembly in direction of travel -arrow-.

All models:

- Take out drive shaft.



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Installing

Install in reverse order, paying attention to the following:

Vehicles with automatic gearbox:

- -> Screw on pendulum support at subframe -arrows-.
- Use new bolts for attachment.

All models:

- Insert drive shaft in wheel bearing housing.

- Install ball joint => Page 34 .
- Place inner joint of drive shaft in position and pre-tighten bolts diagonally to 10 Nm.
- Diagonally finish-tighten multi-point socket head bolts to stipulated torque.
- Tighten drive shaft bolted joint on wheel end.
  - Procedure for tightening twelve-point nut => Page 108
  - Procedure for tightening hexagon collared bolt => Page 109

Tightening torques

Component		Nm
Pendulum support to subframe		20 + 90°1)2)
Drive shaft	M8	40
to flange shaft	M10	70

1) Replace bolts

2) 90°corresponds to quarter turn

Perform wheel alignment on Audi A3 after installation.

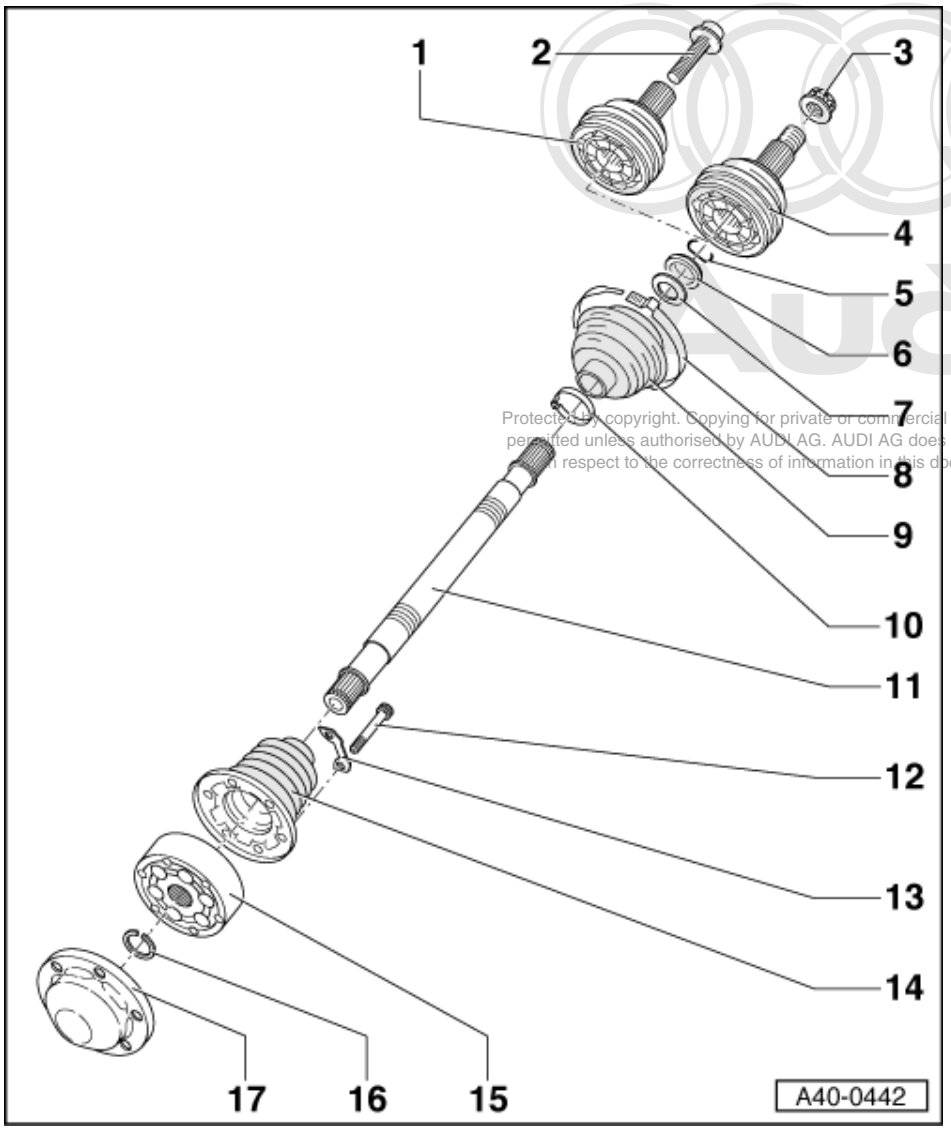
4.5 - Servicing front drive shaft with constant velocity joint

Grease fill of joints

Grease G 000 603	Outer joint ø		Inner joint ø	
	81 mm	90 mm	94 mm	100 mm
Total quantity	80 g	120 g	90 g	120 g
In joint	40 g	80 g	40 g	50 g
In boot	40 g	40 g	50 g	70 g

Note:

Re-grease joint on replacing boot.



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Exploded view of components

1 Outer constant velocity joint

- Replace only as complete assembly
- Checking =>Page 123
- Removing => Fig. 2
- Greasing =>Table, Page 114
- Installing => Fig. 5

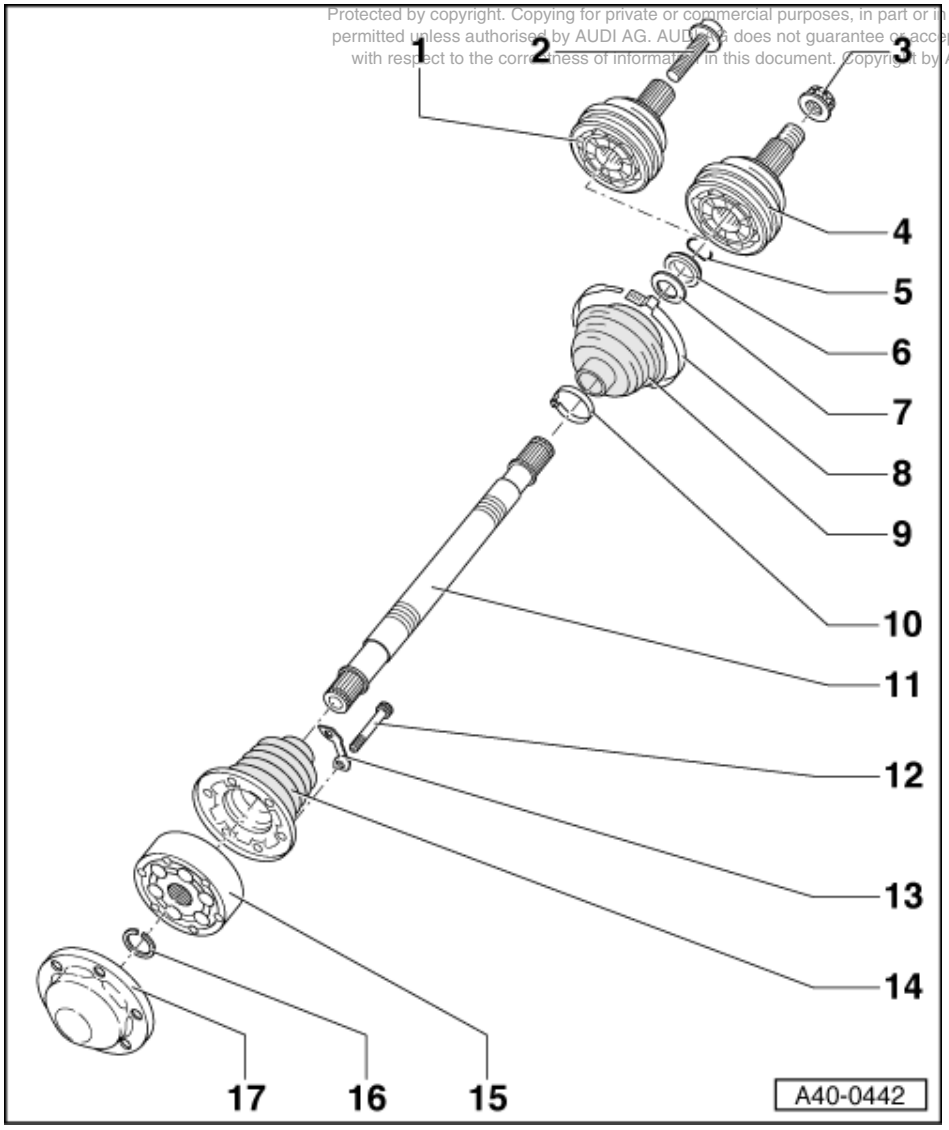
2 Hexagon collared bolt

- Always replace after removing
- Slackening off and tightening => Page 109

3 Twelve-point nut

- Self-locking
- Always replace after removing
- Unfastening and tightening => Page 108
- Remove any paint remnants and/ or corrosion in thread of outer joint before screwing on nut

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4 Outer constant velocity joint

- Replace only as complete assembly
- Checking =>Page 123
- Removing => Fig. 2
- Greasing =>Table, Page 114
- Installing:

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

5 Circlip

- Replace
- Insert in shaft groove

6 Spacer ring (plastic)

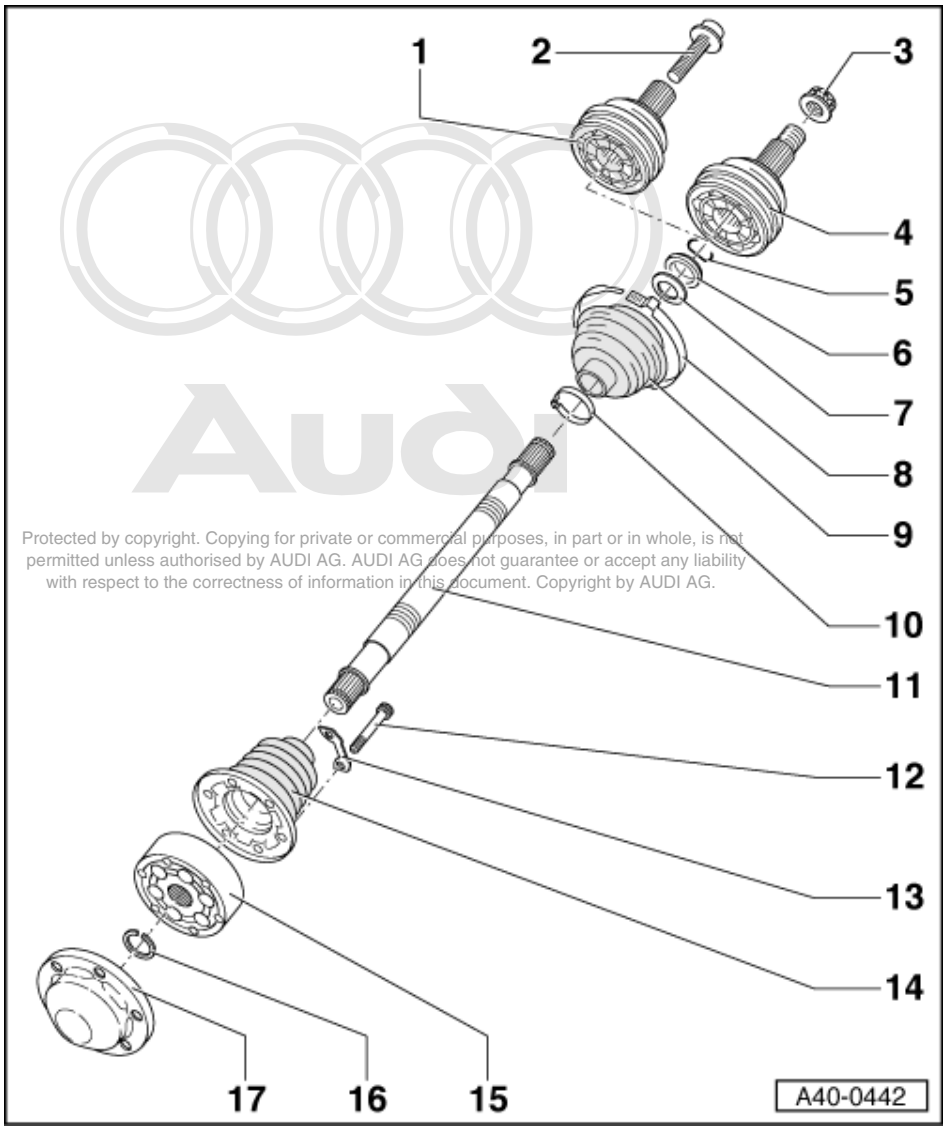
- Installation position => Fig. 7

7 Dished washer

- Installation position => Fig. 7

8 Clamp

- Replace
- Tensioning => Fig. 9



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9 Boot for inner constant velocity joint

- Material: Hytrel (polyelastomers)
- No vent hole
- Check for cracks and abrasion

10 Clamp

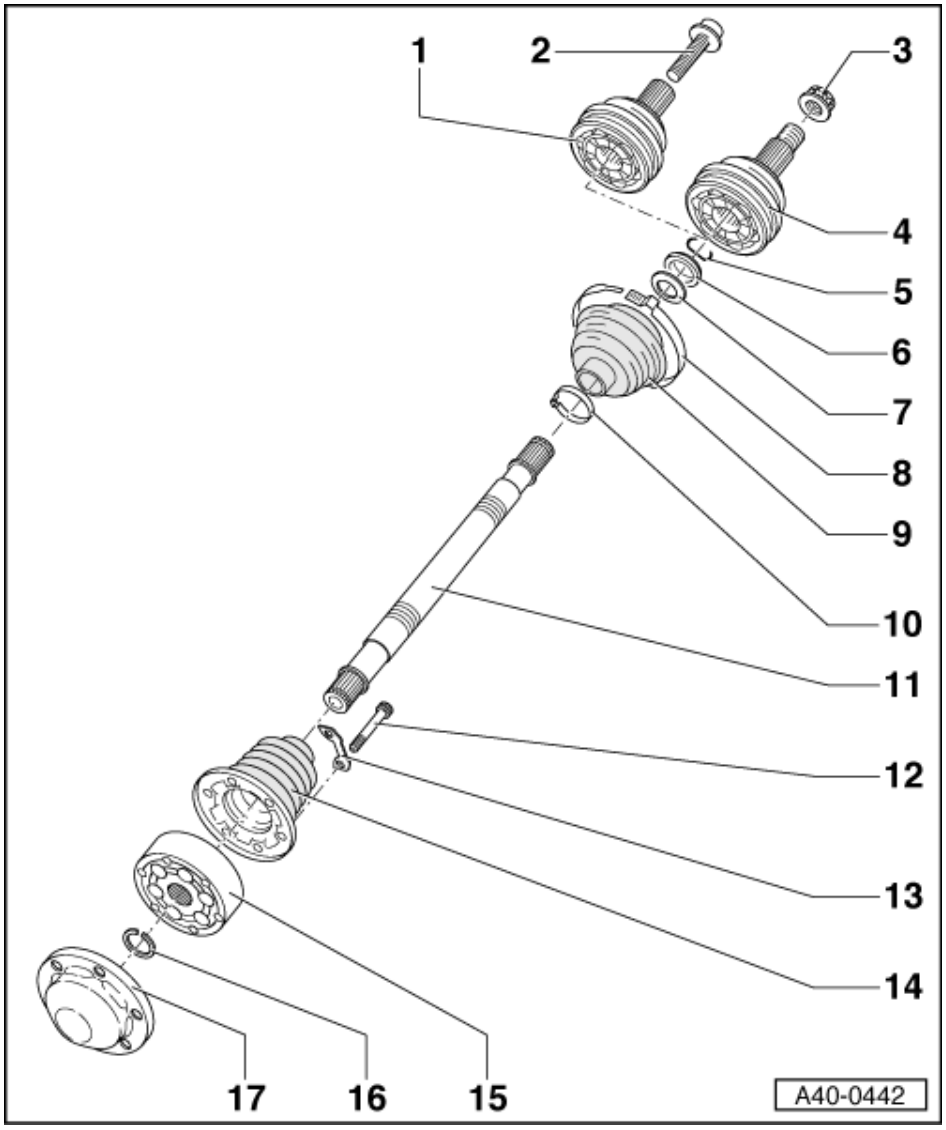
- Replace
- Tensioning => Fig. 9

11 Profile shaft

12 Multi-point socket-head bolt

- Pre-tightening torque: 10 Nm
- Tightening torque for M8: 40 Nm

- Tightening torque for M10: 70 Nm



13 Packing plate

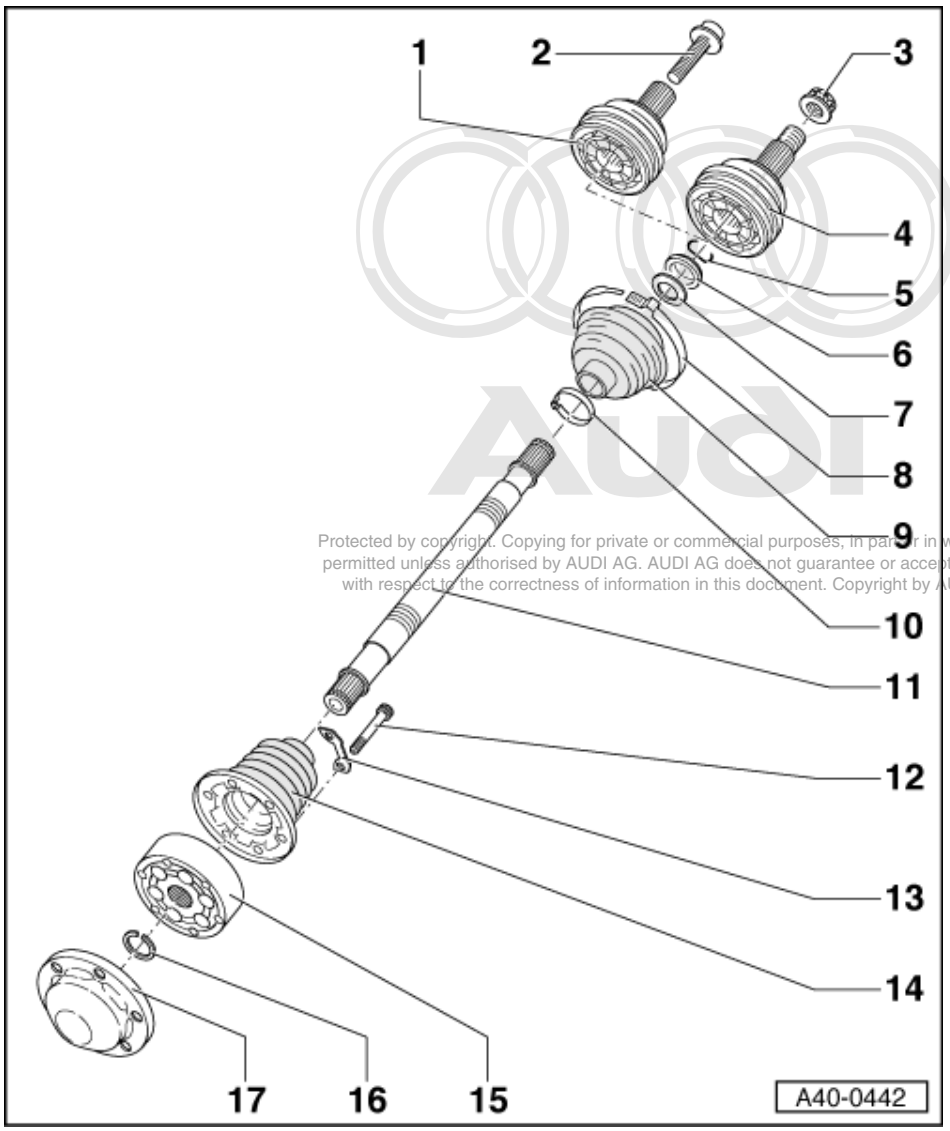
14 Boot for inner constant velocity joint

- Material: Rubber
- With vent hole
- Check for cracks and abrasion
- Use mandrel to drive off from constant velocity joint
- Apply sealant D 454 300 A2 between joint and cap => Fig. 6

15 Inner constant velocity joint

- Replace only as complete assembly
- Checking =>Page 124
- Pressing off => Fig. 3
- Greasing =>Table, Page 114
- Pressing on => Fig. 4

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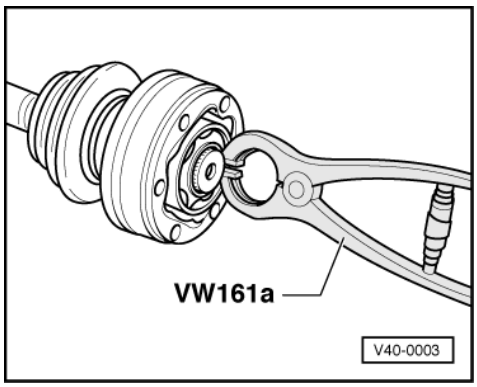
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16 Circlip

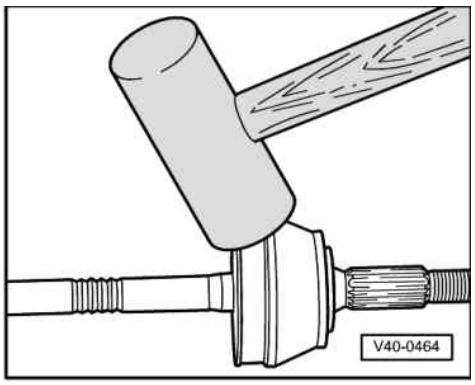
- Replace
- Removing and installing with VW 161 A =>Fig. 1

17 Cap

- Replace
- Use mandrel to drive off from constant velocity joint
- Apply sealant D 454 300 A2 between joint and cap => Fig. 6

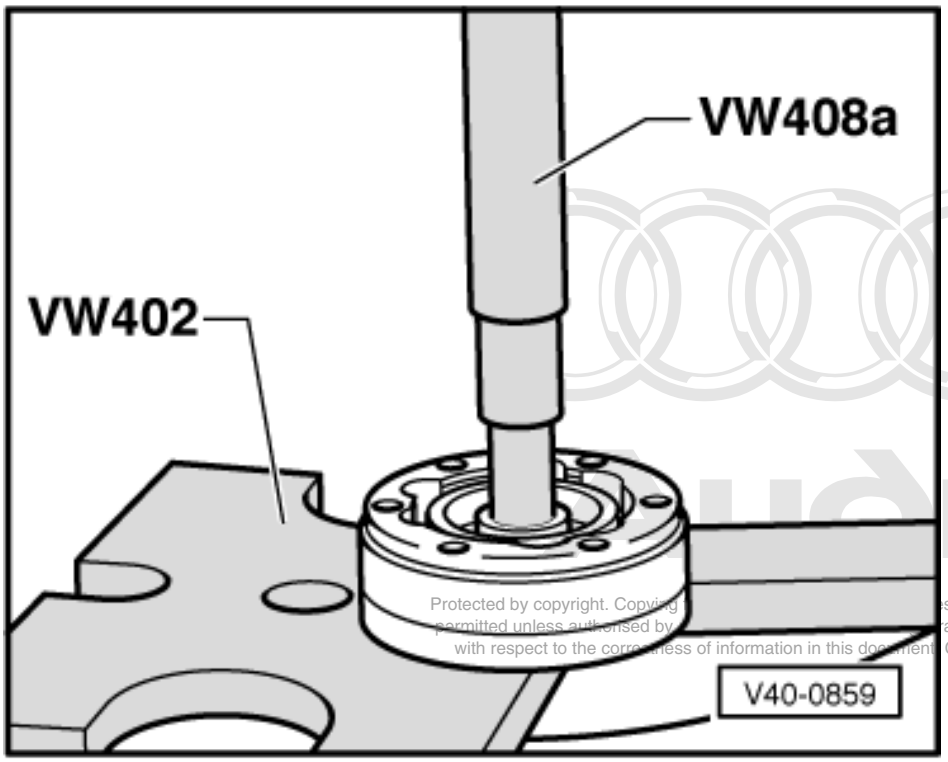


-> Fig.1 Removing and installing circlip



-> Fig.2 Removing outer constant velocity joint

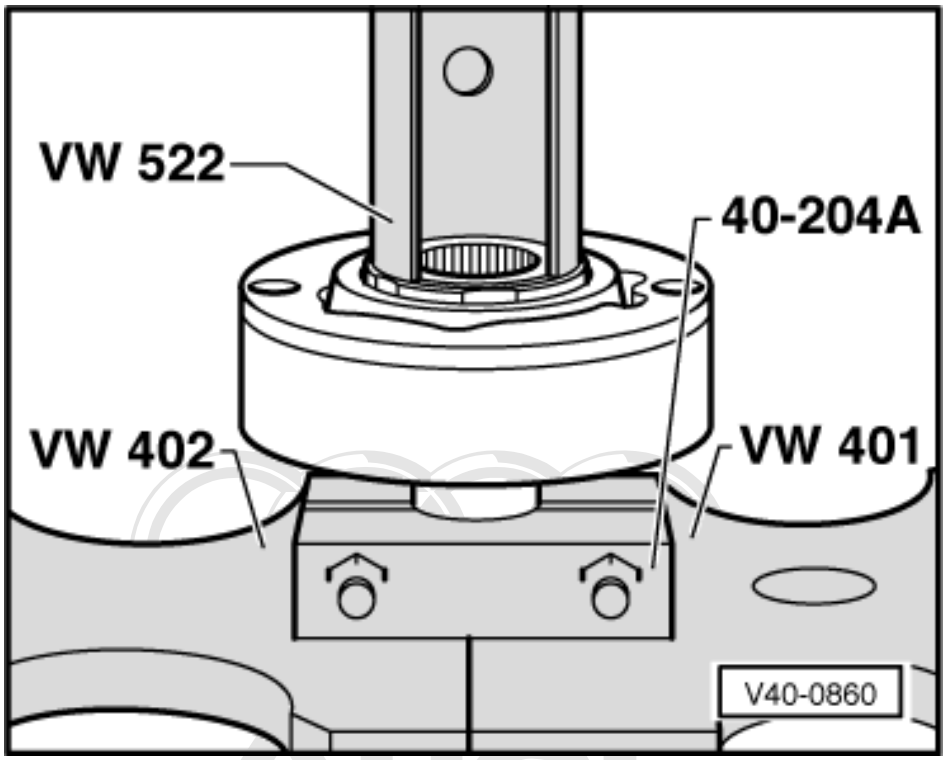
- Tap firmly with light alloy hammer to drive constant velocity joint off drive shaft.



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-> Fig.3 Pressing off inner constant velocity joint

- Use mandrel to drive off boot.
- Support ball hub when pressing off.



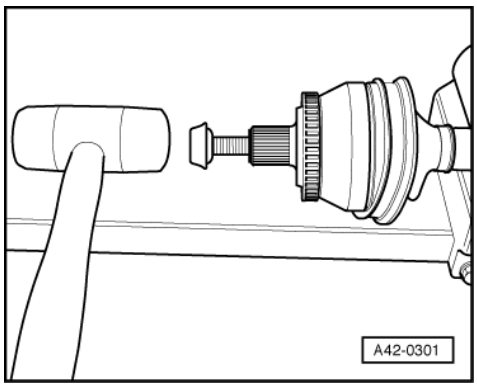
-> Fig.4 Pressing on inner constant velocity joint

- Press on joint as far as it will go.
- Fit circlip.

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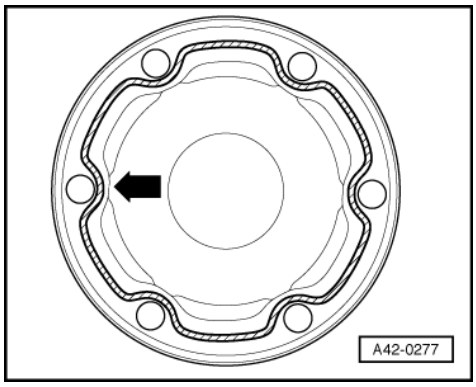
Note:

Chamfer at ID of ball hub (splines) must face contact collar of drive shaft.



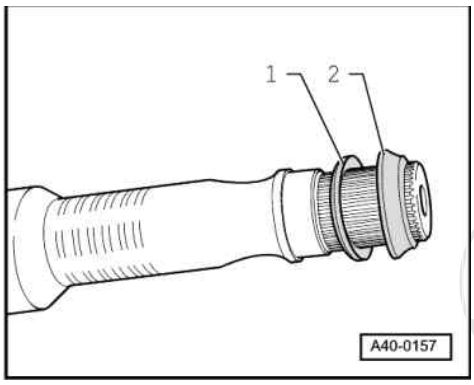
-> Fig.5 Fitting outer constant velocity joint with collared bolt

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



-> Fig.6 Coating sealing surface of cap with D 454 300 A2

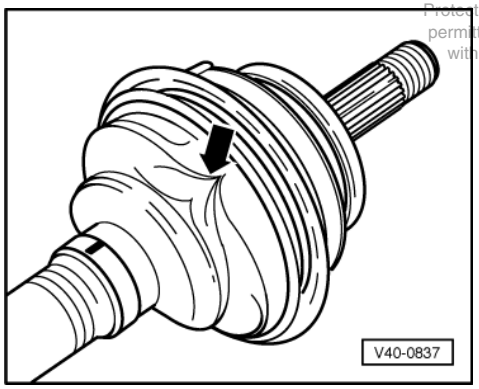
- Apply sealant -hatched area- to clean surface of cap.
  - Sealant bead: Continuous, ø2...3 mm; route round inside of holes -arrow-
- Align cap with bolt holes and drive/press onto joint.
- Wipe off surplus sealant.



-> Fig.7 Installation position of spacer ring and dished washer at outer joint

1 - Dished washer
2 - Spacer ring (plastic)

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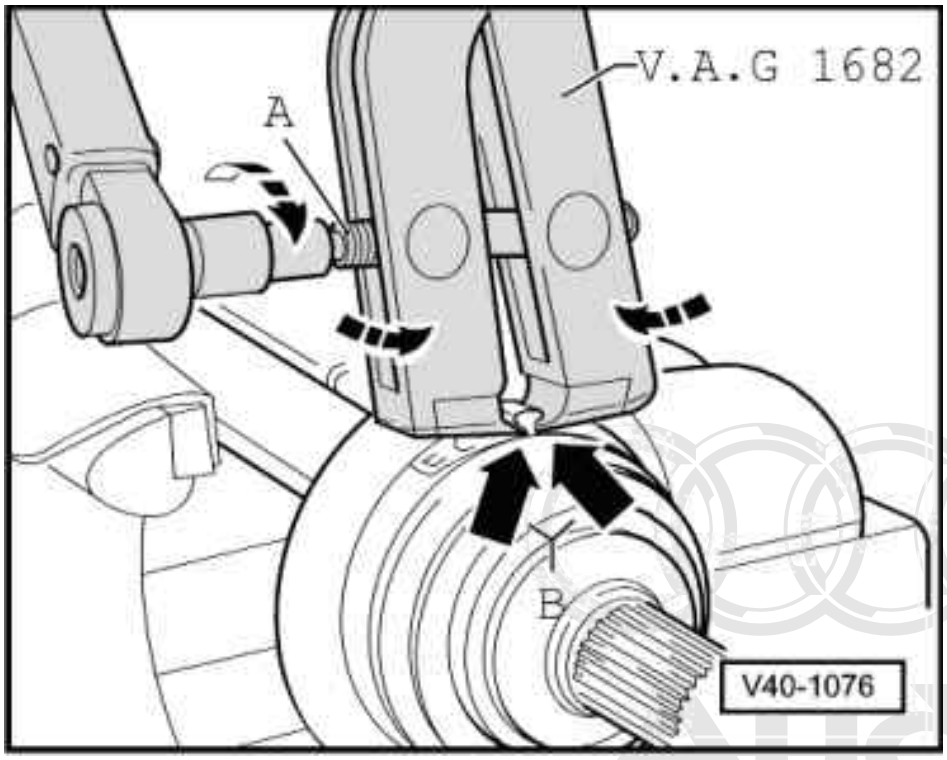


-> Fig.8 Venting rubber boot

Boot is often squashed on positioning it on joint housing. This produces a vacuum in the boot, which causes a fold to form whilst driving -arrow-.

Attention is therefore to be paid to the following:

- Before tensioning clamps, lift boot to ensure pressure equalisation.



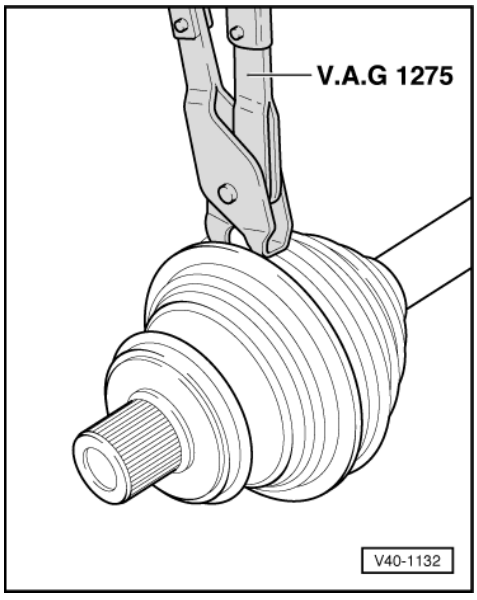
-> Fig.9 Tensioning stainless-steel clamps for Hytrel boots

- Apply pliers V. A.G 1682 as shown. Make sure jaws of pliers make contact with corners (arrows B) of hose clamp.
- Tension hose clamp by turning spindle -A- with torque wrench (take care not to tilt pliers).
  - Tightening torque: 20 Nm

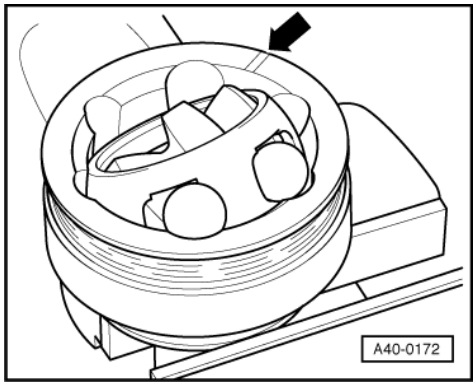
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Notes:

- Make sure thread of spindle on pliers moves freely. Lubricate with MoS2 grease if necessary.
- If stiff, e.g. due to dirt on thread, required clamp tensioning force will not be attained with specified tightening torque.



-> Fig.10 Tensioning clamp for rubber boot



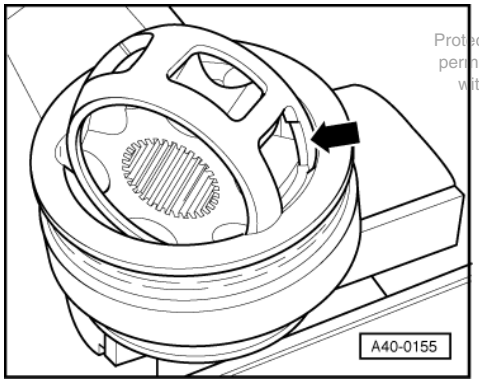
Checking outer constant velocity joint

The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

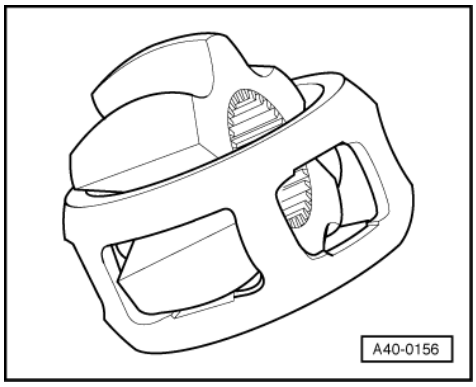
Removing

- -> Use electric scriber or whetstone to mark position of ball hub with respect to ball cage and housing before dismantling -arrow-.
- Swivel ball hub and ball cage and take out balls one after the other.

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- -> Turn cage until two cage openings (arrow) are in contact with joint housing.
- Lift out cage with hub.



- -> Swivel one hub segment into cage opening.
- Tip hub out of cage.

Notes:

- The 6 balls for each joint are of one tolerance group. Check stub axle, hub, cage and balls for pitting and signs of seizure.
- Excessive backlash in joint becomes apparent from load change jolts; joint is then to be replaced.
- Smooth areas and running marks on balls do not necessitate joint replacement.

Installing

Install in reverse order, paying attention to the following:

- Press half the total quantity of grease into the joint housing.
- Insert cage with hub in joint housing.

Note:

Cage must be inserted in correct position.

- Consecutively press in opposite balls, taking care to re-establish previous position of ball hub with respect to ball cage and joint housing.
- Insert new circlip in shaft.
- Distribute remaining grease in boot.

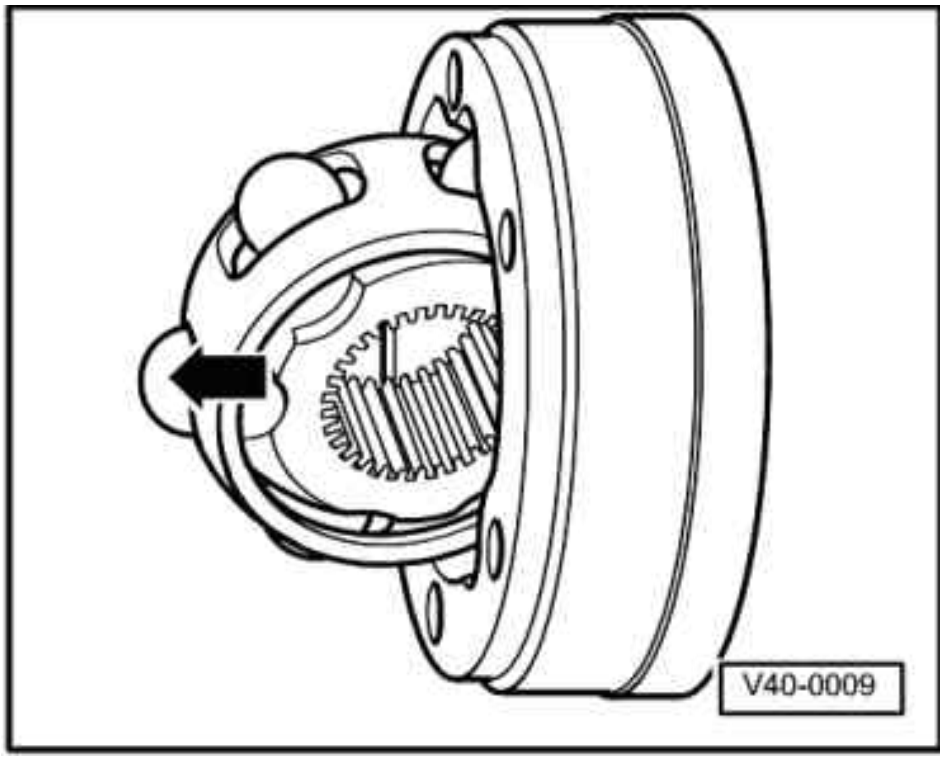
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Checking inner constant velocity joint

The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

Note:

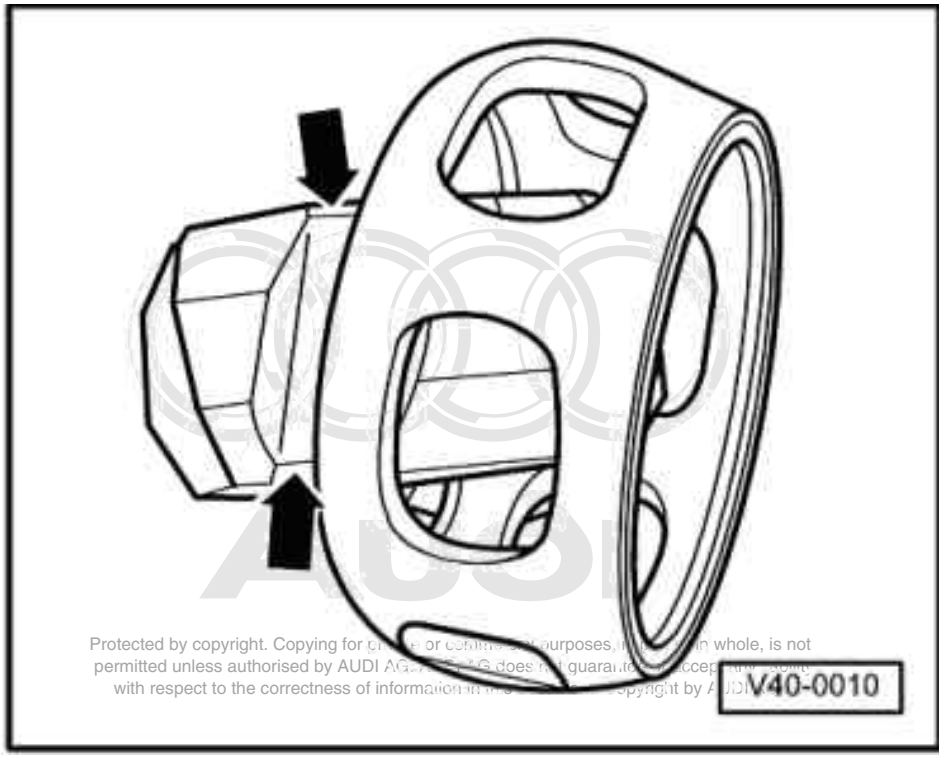
Ball hub and joint element are paired. Mark respective positions with a waterproof felt-tip pen prior to removal.



Removing

- -> Swivel ball hub and ball cage.
- Press out joint element in direction of arrow.

- Press balls out of cage.

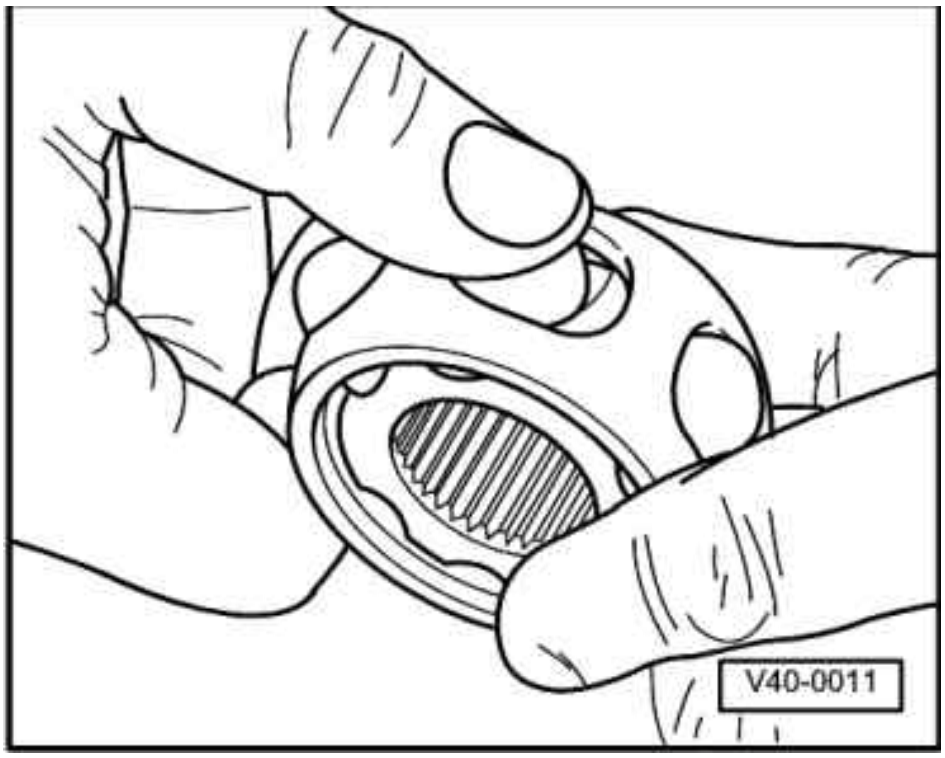


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- -> Tip ball hub out of ball cage via ball raceway -arrows-.
- Check joint element, ball hub, ball cage and balls for pitting and signs of seizure.

Note:

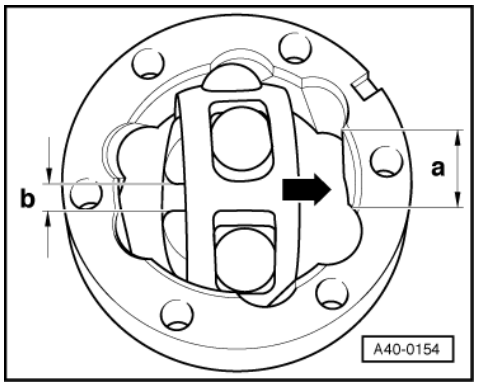
Excessive backlash in joint becomes apparent from load change jolts. Joint is then to be replaced. Smooth areas and running marks on balls do not necessitate joint replacement.



Installing

Install in reverse order, paying attention to the following:

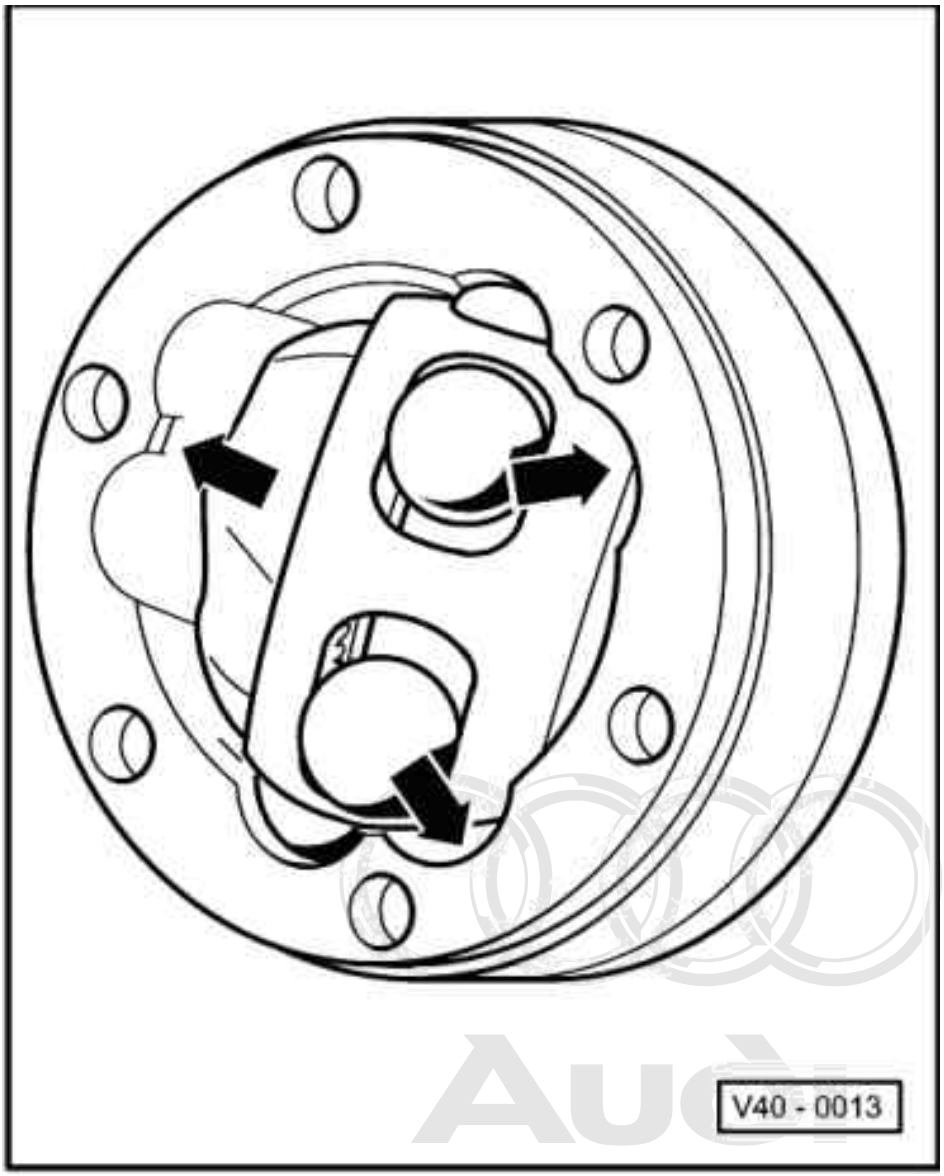
- -> Insert ball hub in ball cage via the two chamfers. Installation position is arbitrary. Press balls into cage.
- Insert hub with cage and balls in upright position in joint element.



Notes:

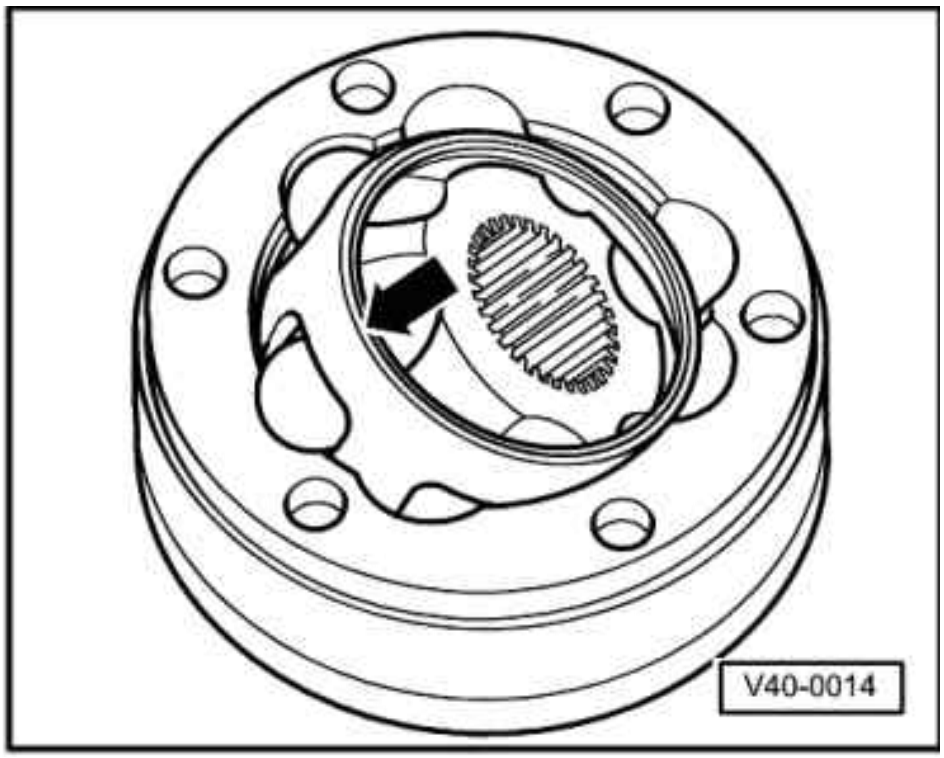
- -> On insertion, make sure that broad gap -a- at joint element coincides with narrow gap -b- at hub after swivelling in.
- Chamfer at ID of ball hub (splines) must face large diameter of joint element.
- On installation, also use felt-tip pen mark made on removal as a guide.

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- -> Swivel in ball hub; to do so swivel hub out of cage (arrows) until the spacing of the balls corresponds to that of the raceways.

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- -> Swivel in hub with balls by pressing firmly on cage (arrow).

Checking operation of constant velocity joint

Constant velocity joint has been correctly assembled if ball hub can be pushed back and forth by hand over entire length compensation range.

4.6 - Servicing drive shaft with triple roller joint AAR 2000

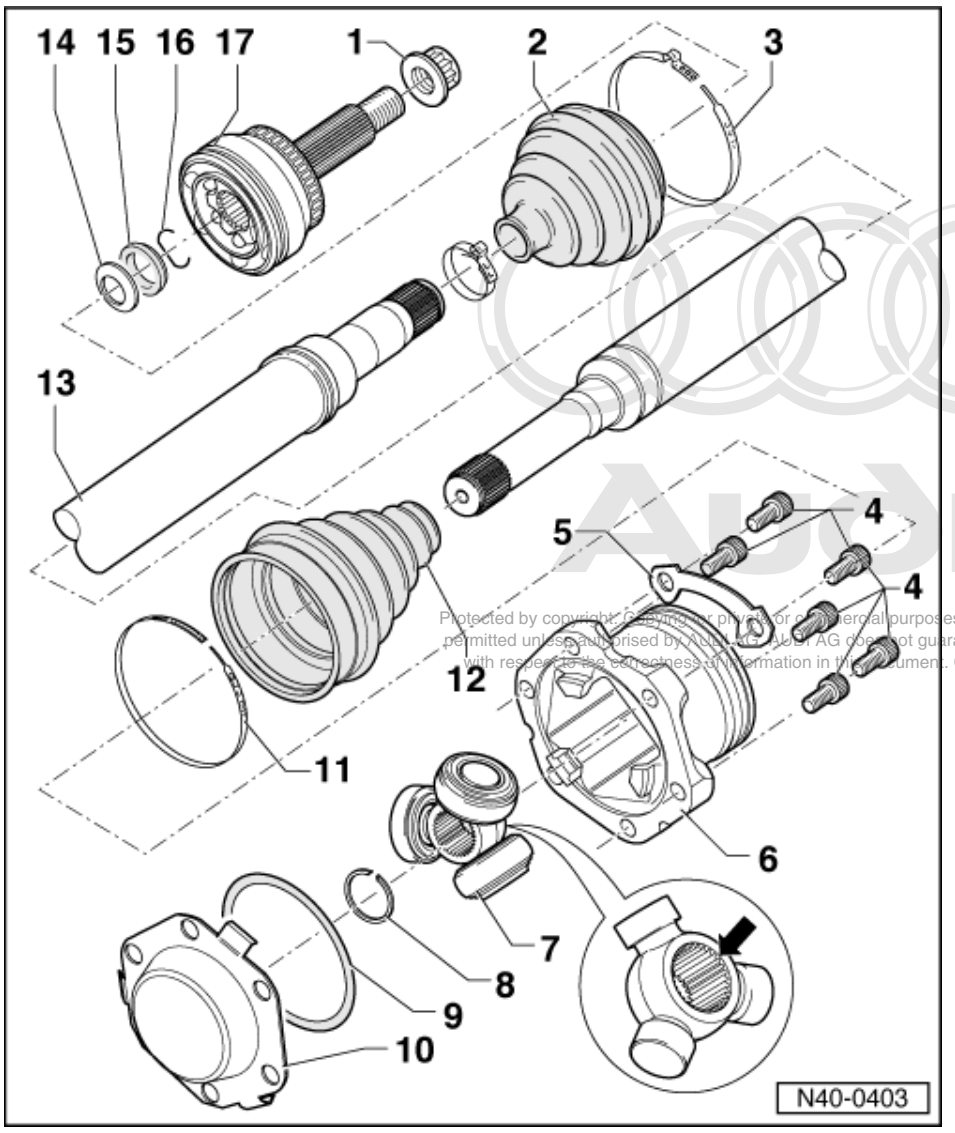
Grease fill of joints

Grease G 600.003	**Outer joint**
Total quantity	120 g
In joint	80 g
In boot	40 g
Grease G 000 605	**Triple roller joint**
Total quantity	110 g
In joint	70 g
In boot	40 g

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Note:

Re-grease joint on replacing boot.



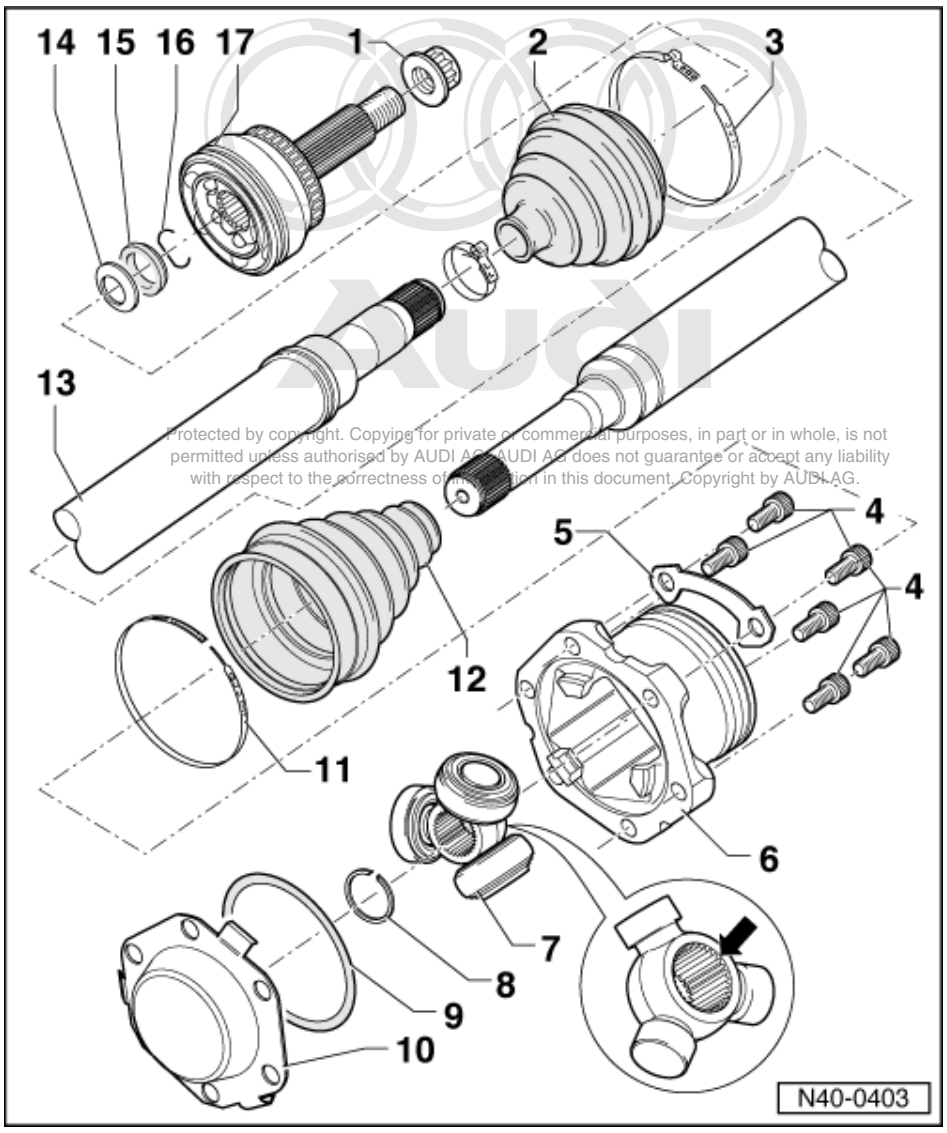
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Exploded view of components

1 Twelve-point nut
- Self-locking
- Always replace after removing
- Unfastening and tightening
  => Page 108
- Remove any paint remnants and/or corrosion in thread of outer joint before screwing on nut

2 Boot for constant velocity joint
- Check for cracks and abrasion

3 Clamp
- Replace
- Tensioning => Fig. 5



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4 Multi-point socket-head bolt

- Pre-tightening torque: 10 Nm
- Tightening torque for M8: 40 Nm
- Tightening torque for M10: 70 Nm

5 Packing plate

- For joints of ø 108 mm only

6 Joint element

7 Triple roller star with rollers

- Chamfer -arrow- faces drive shaft splines

8 Circlip

- Replace

9 O-ring

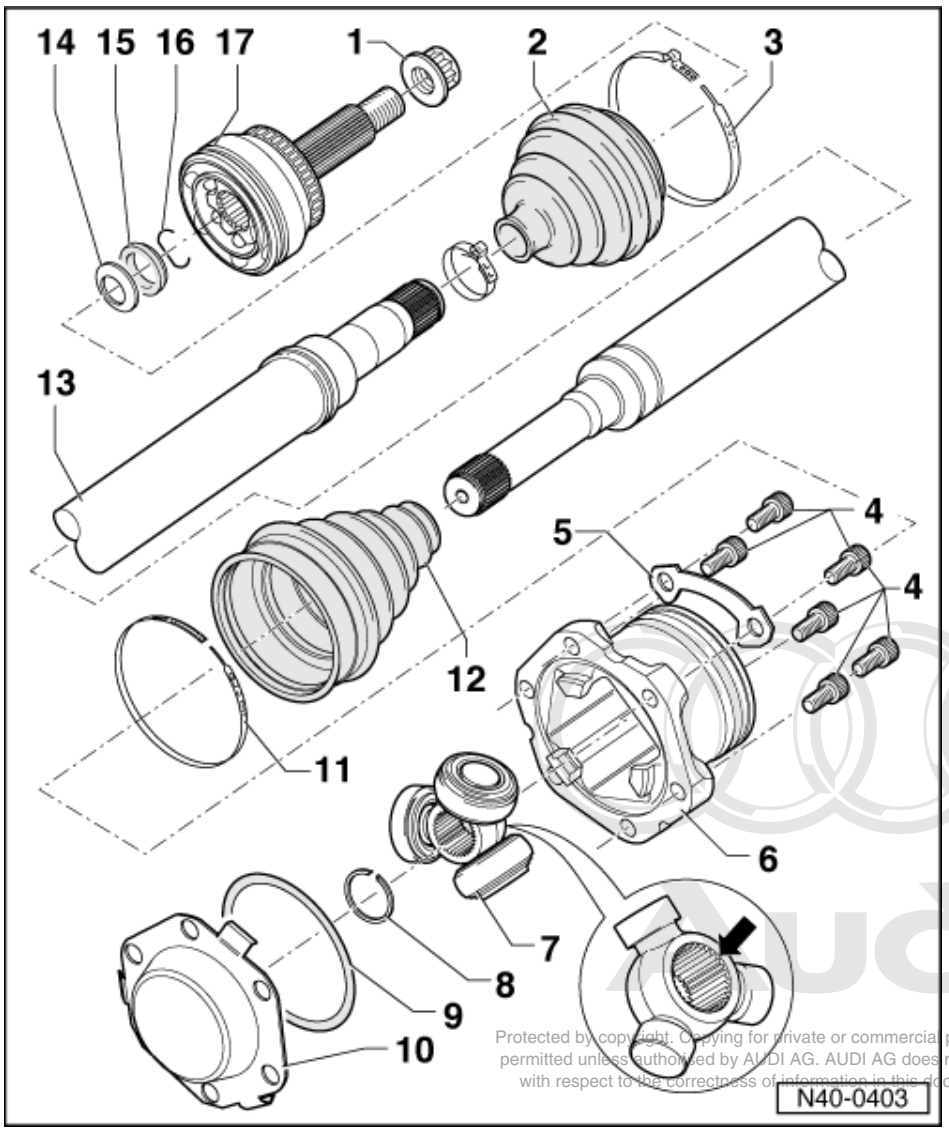
- Replace

10 Cap

- Replace

11 Clamp

- Replace
- Tensioning => Fig. 4



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12 Boot for triple roller joint

- Check for cracks and abrasion

13 Drive shaft

14 Dished washer

- Installation position => Fig. 2

15 Spacer ring (plastic)

- Installation position => Fig. 2

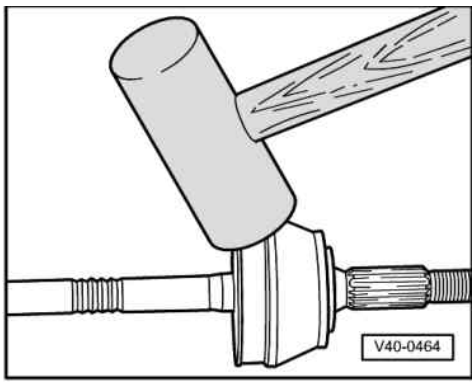
16 Circlip

- Replace
- Insert in shaft groove

17 Outer constant velocity joint

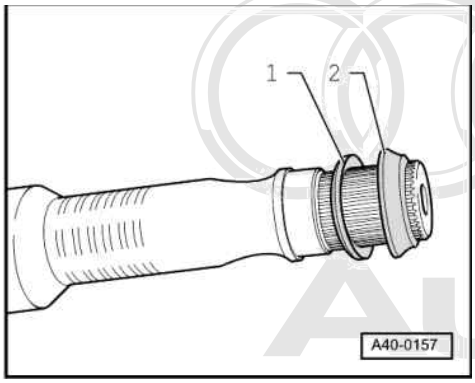
- Replace only as complete assembly
- Checking =>Page 138
- Removing => Fig. 1
- Greasing =>Table, Page 128
- Installing:

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



-> Fig.1 Removing outer constant velocity joint

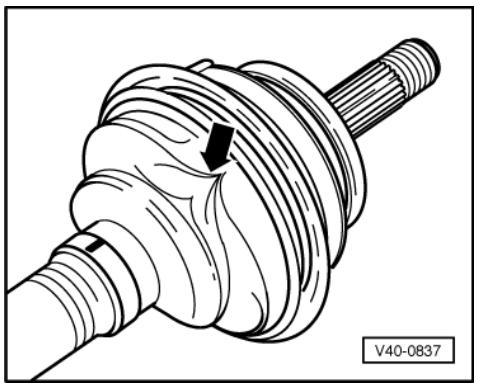
- Tap firmly with light alloy hammer to drive constant velocity joint off drive shaft.



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Fig.2 -> Installation position of spacer ring and dished washer

1 - Dished washer
2 - Spacer ring (plastic)

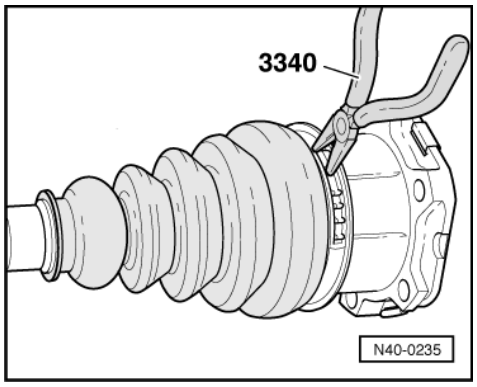


-> Fig.3 Venting rubber boot

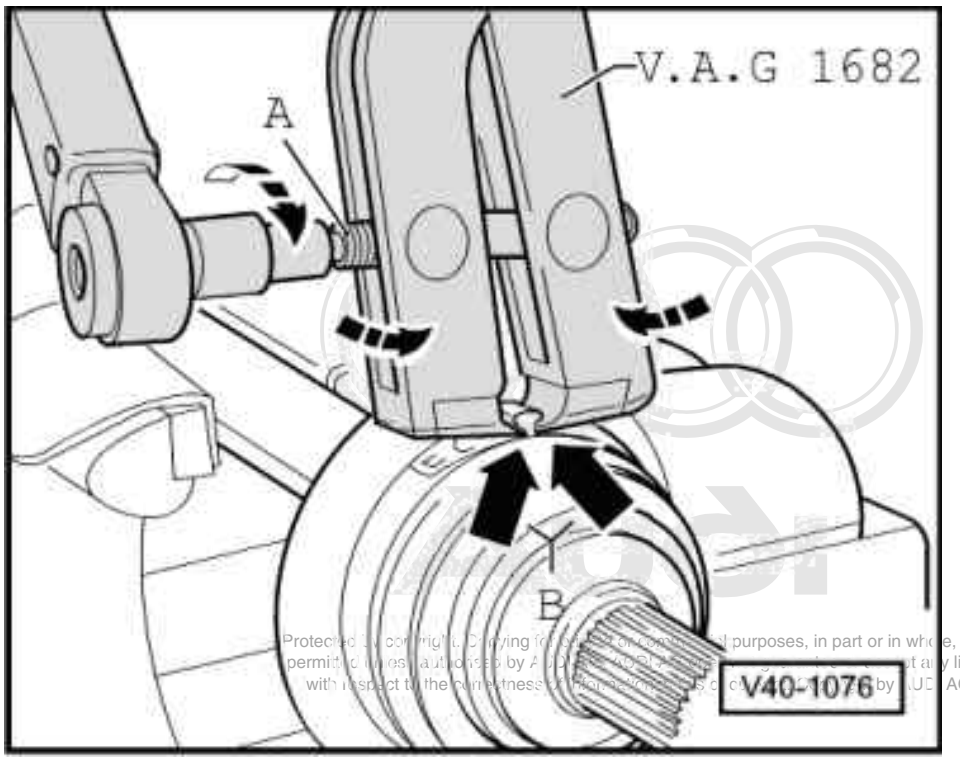
Boot is often squashed on positioning it on joint housing. This produces a vacuum in the boot, which causes a fold to form whilst driving -arrow-.

Attention is therefore to be paid to the following:

- Before tensioning clamps, lift boot to ensure pressure equalisation.



-> Fig.4 Tensioning clamp for rubber boot



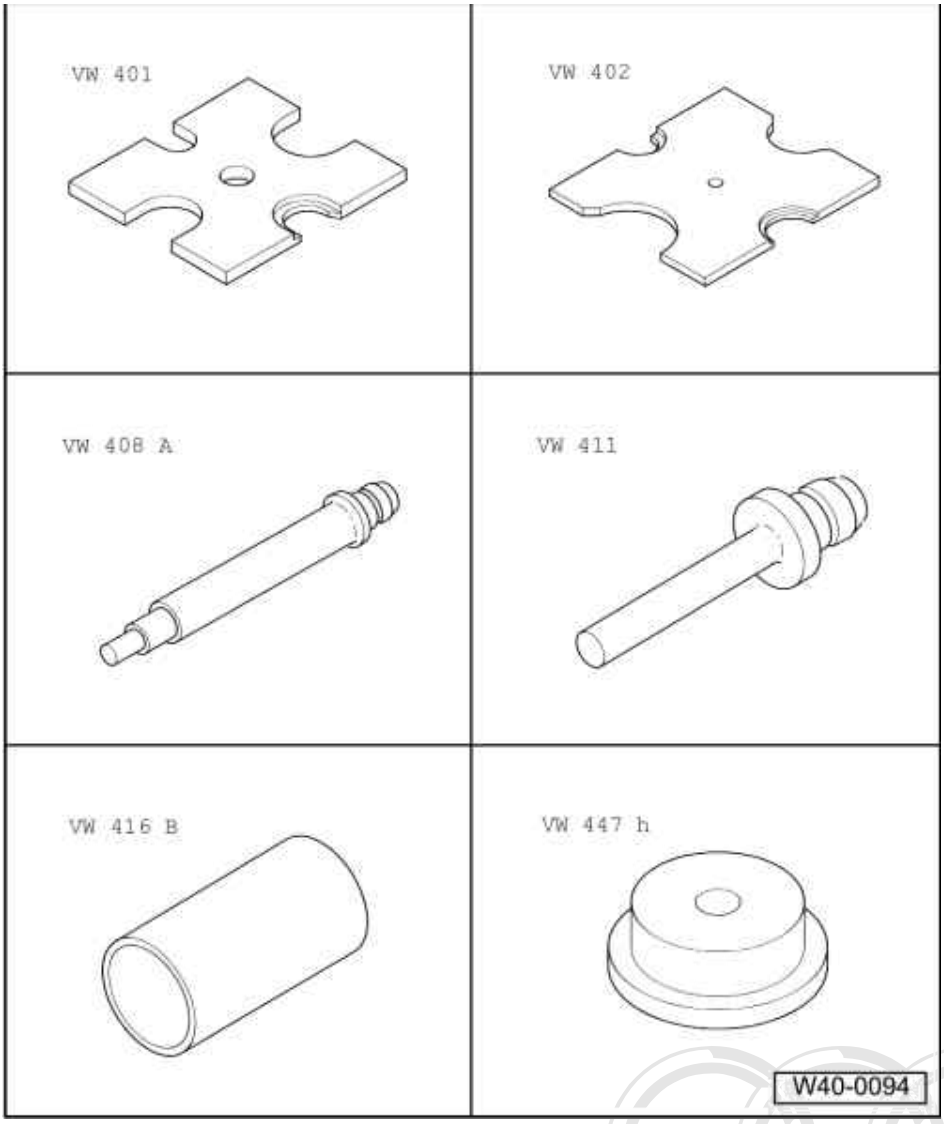
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-> Fig.5 Tensioning stainless-steel clamps for Hytrel boots

- Apply pliers V. A.G 1682 as shown. Make sure jaws of pliers make contact with corners (arrows B) of hose clamp.
- Tension hose clamp by turning spindle -A- with torque wrench (take care not to tilt pliers).
  - Tightening torque: 20 Nm

Notes:

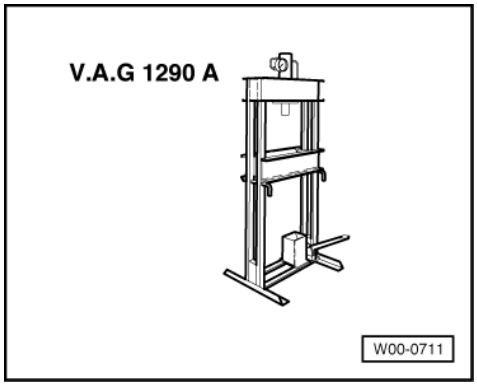
- Make sure thread of spindle on pliers moves freely. Lubricate with MoS2 grease if necessary.
- If stiff, e.g. due to dirt on thread, required clamp tensioning force will not be attained with specified tightening torque.



Dismantling and assembling triple roller joint AAR 2000

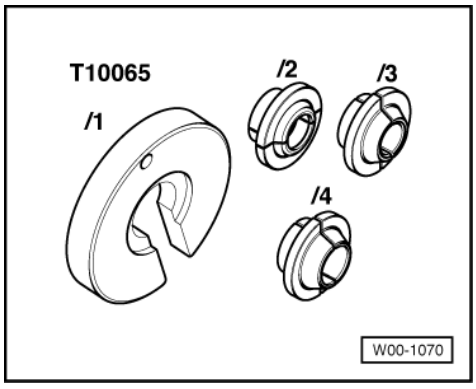
Special tools and workshop equipment required

- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 408 A
- Press tool VW 411
- Tubular section VW 416 B
- Thrust pad VW 447 H

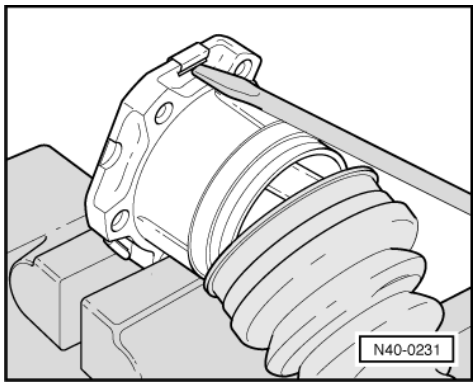


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- Workshop press V.A.G 1290 A



- Assembly device T10065

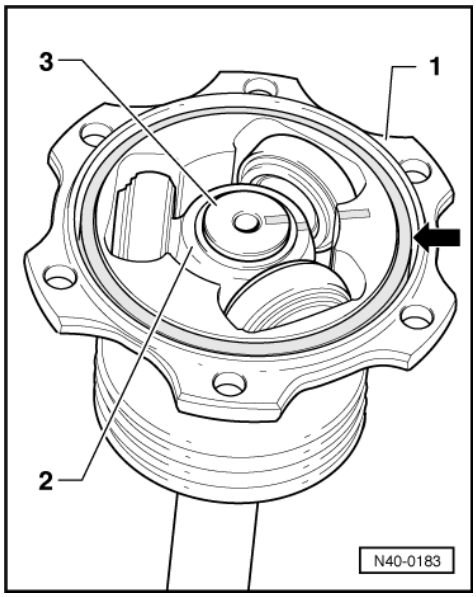


Dismantling

- Drive shaft removed => Page 110

- Unfasten clamp at shaft and push back boot.
- -> Use slotted screwdriver to bend open metal tabs and prise off cap.

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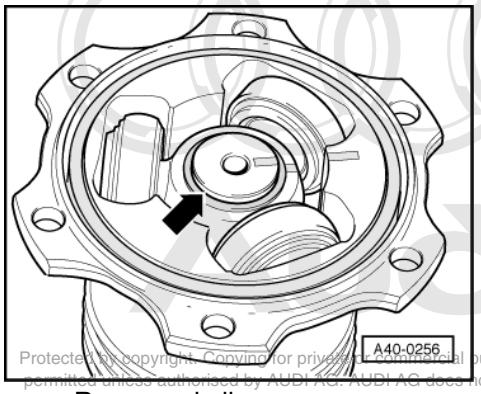
- -> Mark installation position of components -1. . .3- using waterproof felt-tip pen.

1 - Joint element
2 - Triple roller star
3 - Drive shaft

Note:

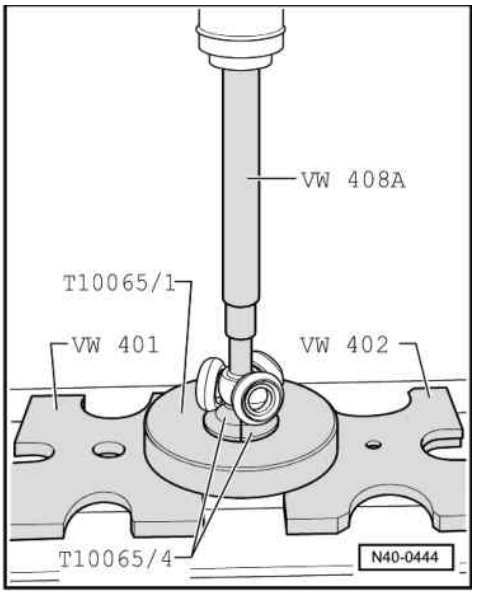
Noise may subsequently be encountered whilst driving if components are not fitted in their original position on assembly.

- Take O-ring -arrow- out of groove.
- Grasp hold of joint element and take drive shaft out of vice.

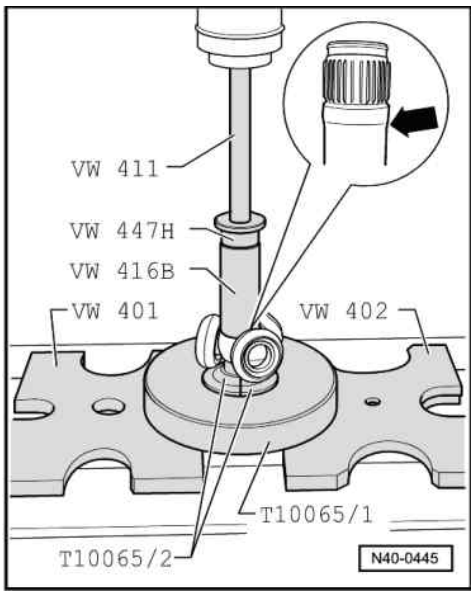


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- -> Remove circlip -arrow-.



- Insert drive shaft in press.
- -> Grasp hold of drive shaft and then press triple roller star off drive shaft.
- Detach triple roller star with rollers and set down on clean surface.
- Detach joint element from shaft.
- Detach boot from shaft.
- Clean shaft, joint element and groove for sealing ring.



Assembling

- Slip boot onto shaft.
- Slip joint element onto shaft.

Fitting triple roller star

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

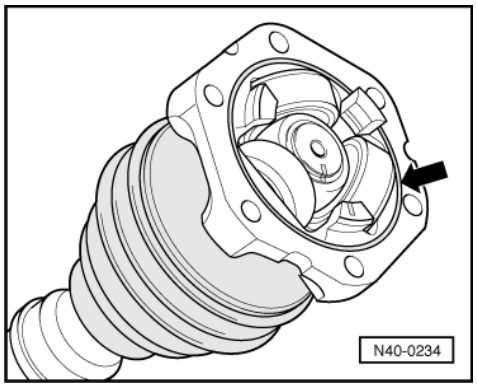
- -> Attach triple roller star to shaft in line with marking and press home.

Make sure pressure does not exceed 3.0 t!

- If necessary, coat splines of drive shaft and triple roller star with polycarbamide grease G 052 142 A2.
- Fit circlip, making sure that it is correctly positioned.
- Slip joint element over rollers and hold in position.
- Press 70 g of drive shaft grease from repair set into triple roller joint.
- Press 40 g of drive shaft grease from repair set into boot.

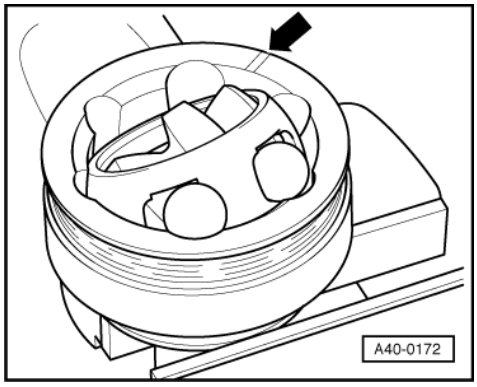
- Fit boot.
  - Bead in boot must engage in groove of joint element
- Then take drive shaft out of vice and clamp joint element in position in vice.

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- -> Insert new sealing ring -arrow- from repair set in groove.
- Fit new cap on joint element.
  - Cap and joint element holes must be aligned

- Fit clamp.



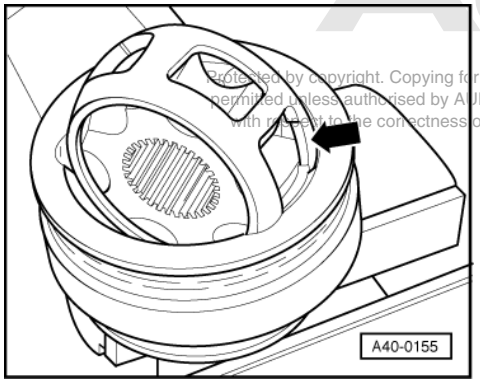
Checking outer constant velocity joint

The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

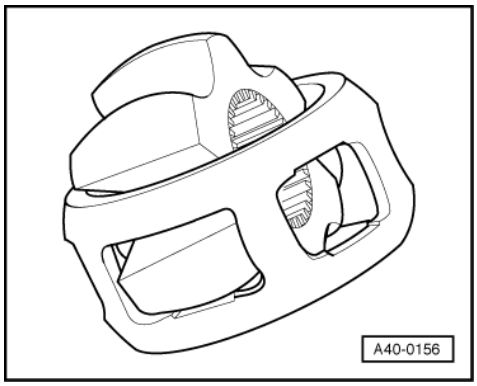
Removing

- -> Use electric scriber or whetstone to mark position of ball hub with respect to ball cage and housing before dismantling -arrow-.
- Swivel ball hub and ball cage and take out balls one after the other.

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- -> Turn cage until two cage openings (arrow) are in contact with joint housing.
- Lift out cage with hub.



- -> Swivel one hub segment into cage opening.
- Tip hub out of cage.

Notes:

- The 6 balls for each joint are of one tolerance group. Check stub axle, hub, cage and balls for pitting and signs of seizure.
- Excessive backlash in joint becomes apparent from load change jolts; joint is then to be replaced.
- Smooth areas and running marks on balls do not necessitate joint replacement.

Installing

Install in reverse order, paying attention to the following:

- Press half the total quantity of grease into the joint housing.
- Insert cage with hub in joint housing.

Note:

Cage must be inserted in correct position.

- Consecutively press in opposite balls, taking care to re-establish previous position of ball hub with respect to ball cage and joint housing.
- Insert new circlip in shaft.
- Distribute remaining grease in boot.

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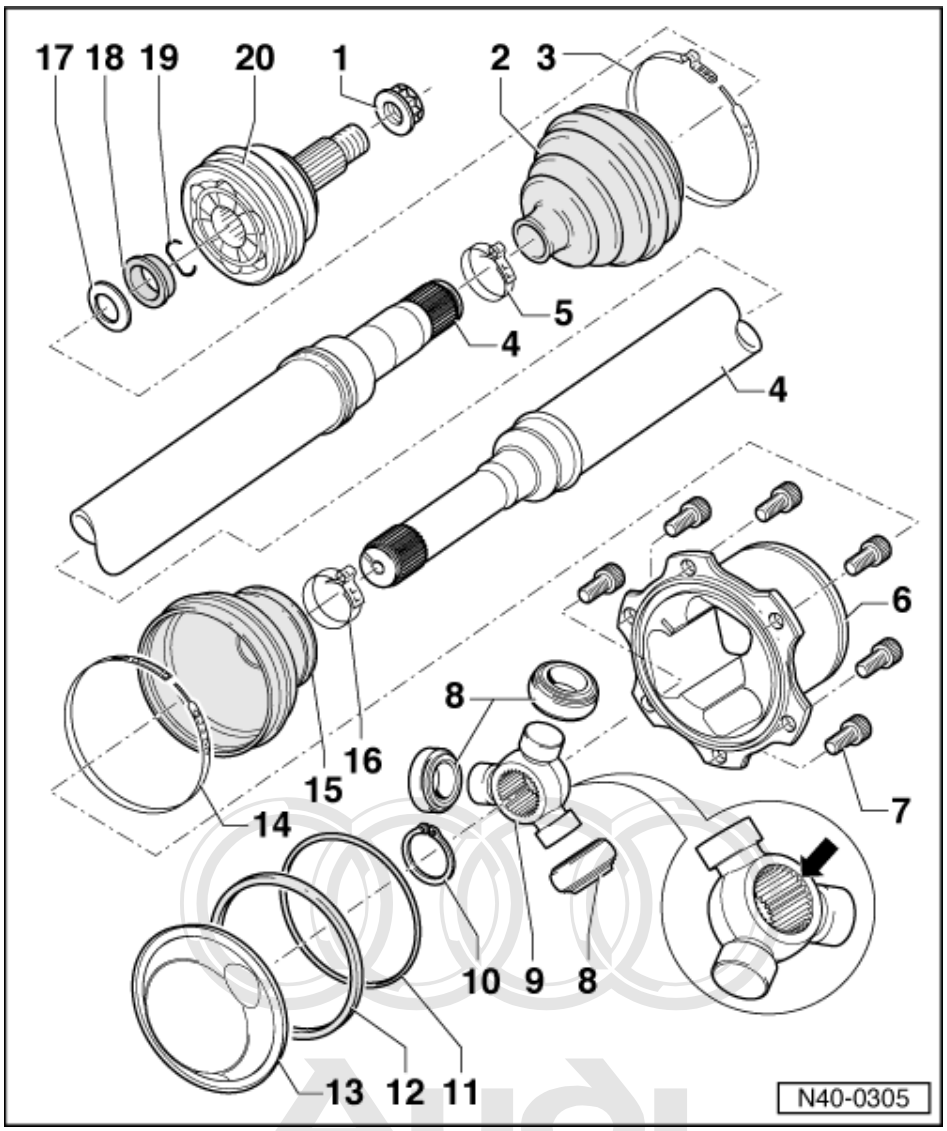
4.7 - Servicing drive shaft with triple roller joint AAR 2900

Grease fill of joints

Grease G 600.003	**Outer joint**
Total quantity	120 g
In joint	80 g
In boot	40 g
Grease G 000 605	**Triple roller joint**
Total quantity	140 g
In joint	70 g
In boot	70 g

Note:

Re-grease joint on replacing boot.



Exploded view of components

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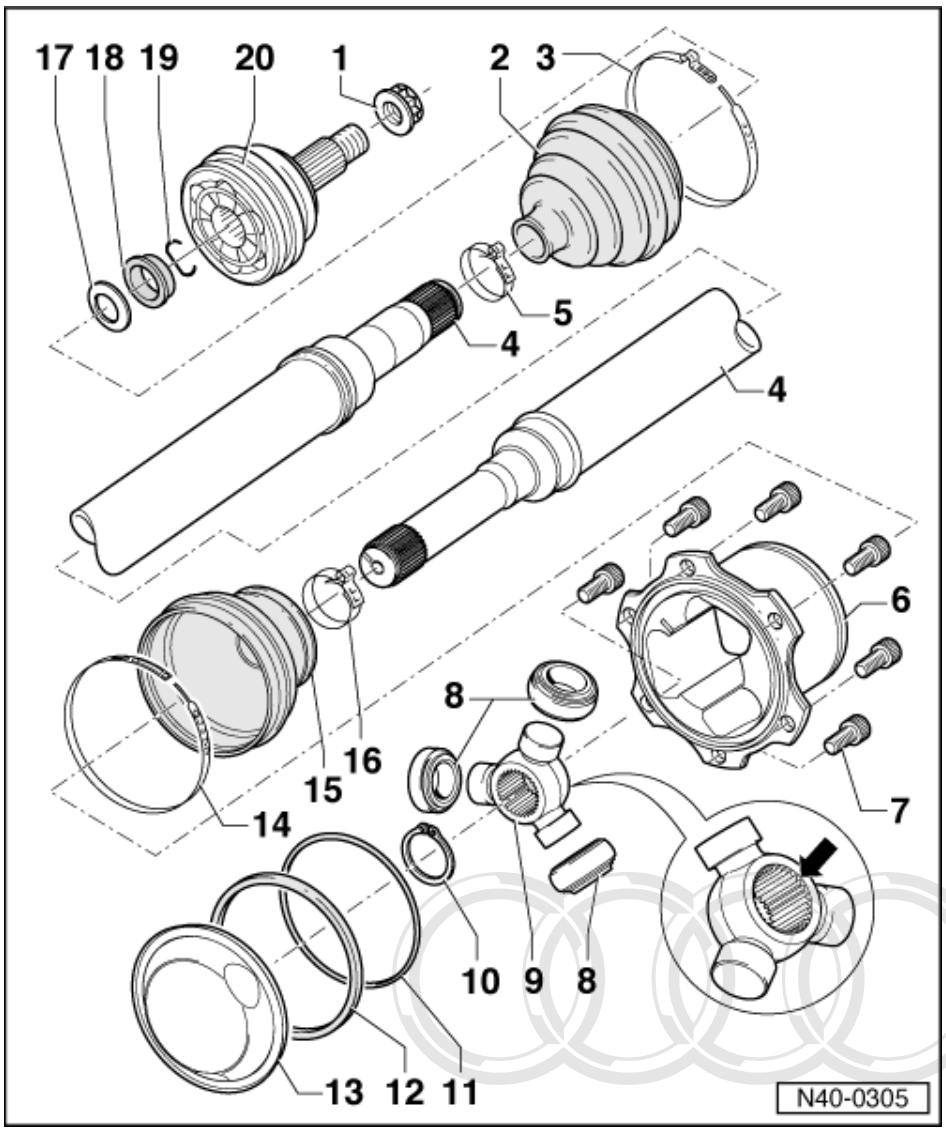
1 **Twelve-point nut**
- Self-locking
- Always replace after removing
- Unfastening and tightening
  => Page 108
- Remove any paint remnants and/or corrosion in thread of outer joint before screwing on nut

2 **Boot for constant velocity joint**
- Check for cracks and abrasion

3 **Clamp**
- Replace
- Tensioning => Fig. 5

4 **Drive shaft**

5 **Clamp**
- Replace
- Tensioning => Fig. 5



6 Joint element

7 Multi-point socket-head bolt

- Pre-tightening torque: 10 Nm
- Tightening torque for M8: 40 Nm
- Tightening torque for M10: 70 Nm

8 Rollers

9 Triple roller star

- Chamfer -arrow- faces drive shaft splines

10 Circlip

- Replace

11 O-ring

- Replace with plain sealing ring -Item 12 - when performing repair work

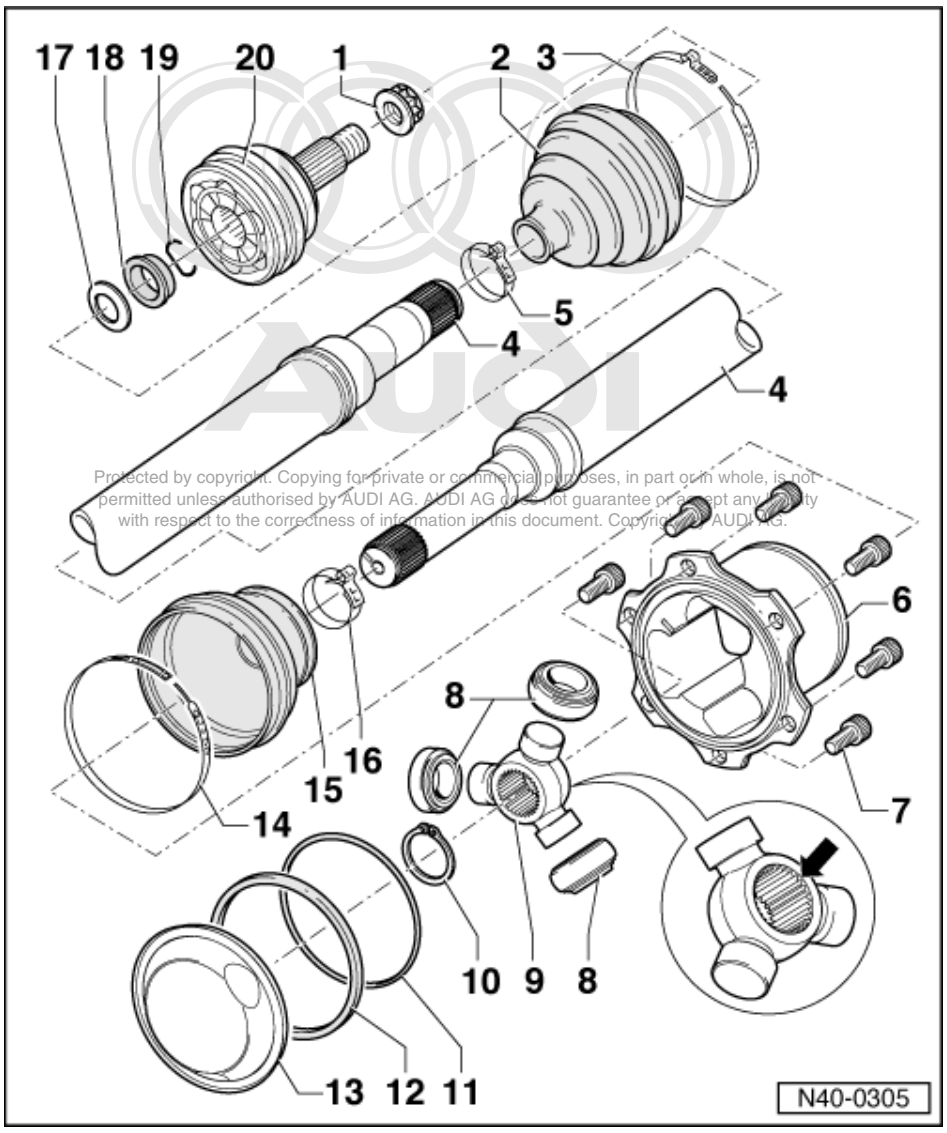
12 Plain sealing ring

- Part of repair set

13 Cap

- Replace

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14 Clamp

- Replace
- Tensioning => Fig. 4

15 Boot for triple roller joint

16 Clamp

- Replace
- Tensioning => Fig. 6

17 Dished washer

- Installation position => Fig. 2

18 Spacer ring (plastic)

- Installation position => Fig. 2

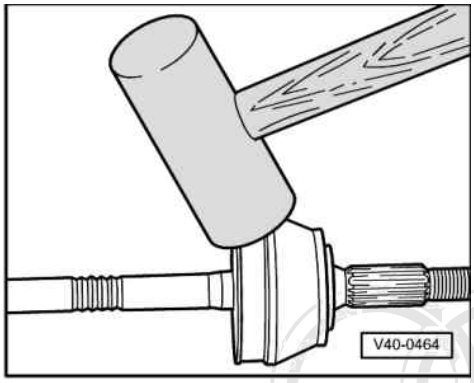
19 Circlip

- Replace
- Insert in shaft groove

20 Outer constant velocity joint

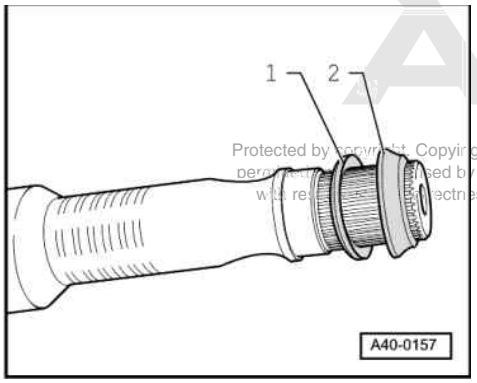
- Replace only as complete assembly
- Checking =>Page 151
- Removing => Fig. 1
- Greasing =>Table, Page 139
- Installing:

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



-> Fig.1 Removing outer constant velocity joint

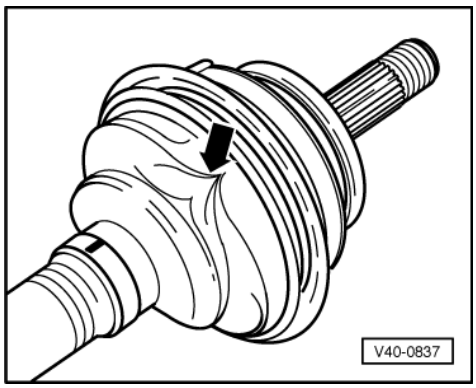
- Tap firmly with light alloy hammer to drive constant velocity joint off drive shaft.



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Fig.2 -> Installation position of spacer ring and dished washer

1 - Dished washer
2 - Spacer ring (plastic)

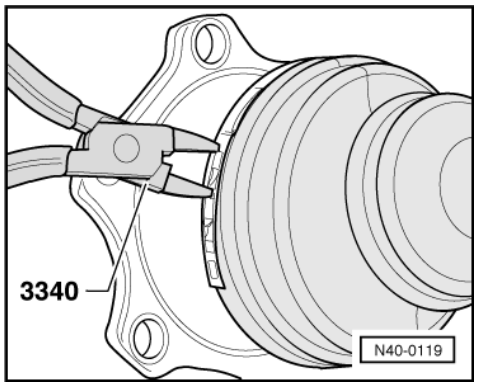


-> Fig.3 Venting rubber boot

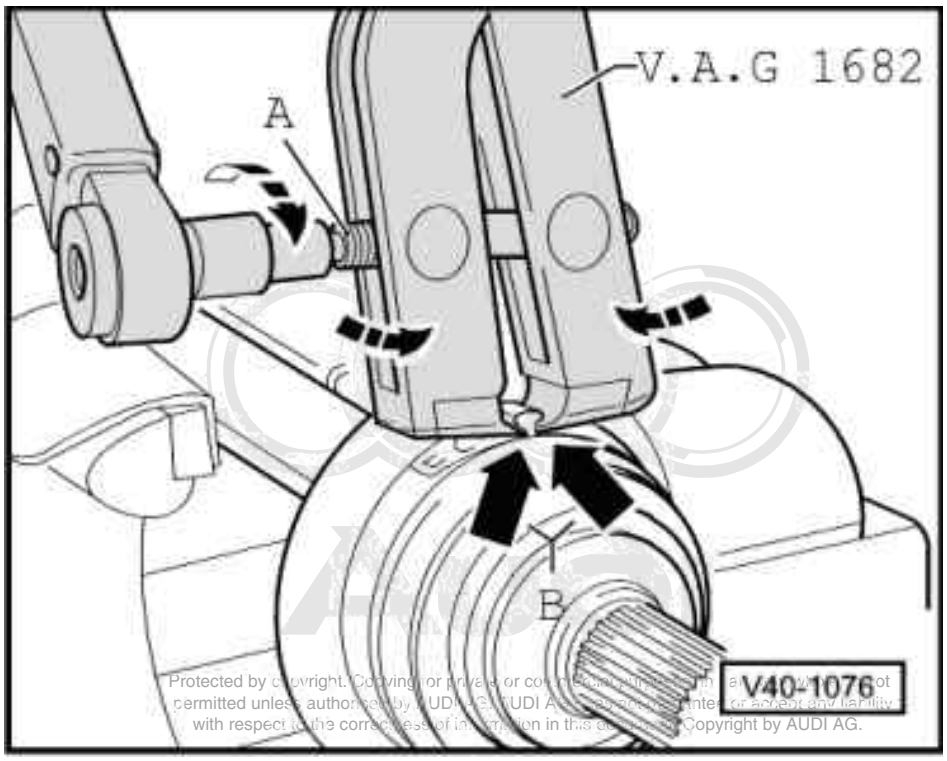
Boot is often squashed on positioning it on joint housing. This produces a vacuum in the boot, which causes a fold to form whilst driving -arrow-.

Attention is therefore to be paid to the following:

- Before tensioning clamps, lift boot to ensure pressure equalisation.



-> Fig.4 Tensioning large clamp for rubber boot

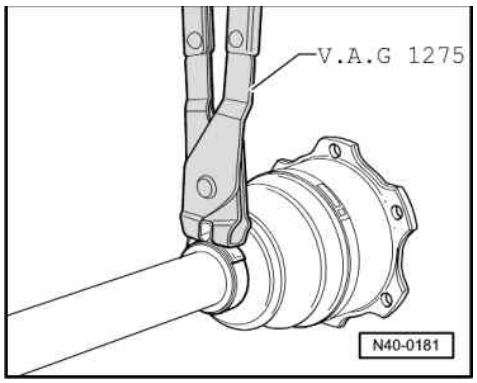


-> Fig.5 Tensioning stainless-steel clamps for Hytrel boots

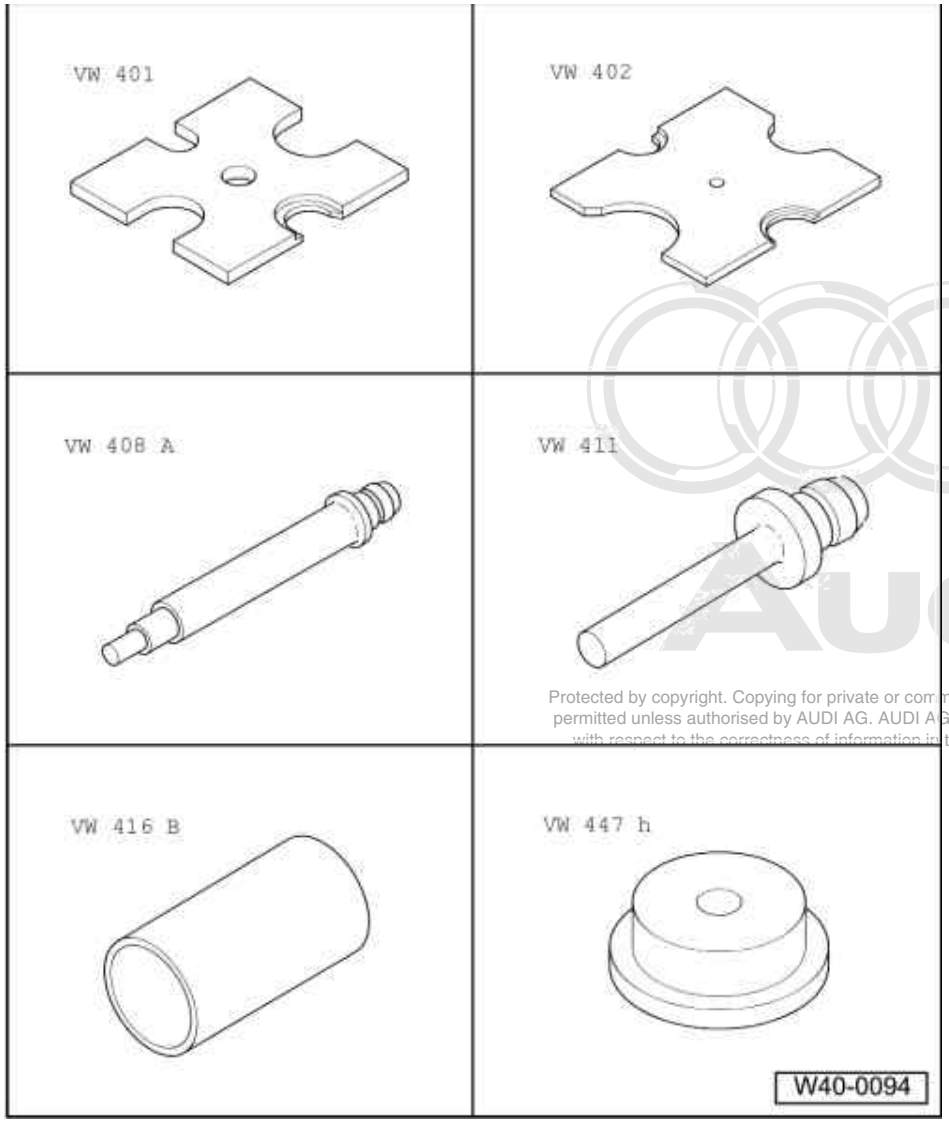
- Apply pliers V. A.G 1682 as shown. Make sure jaws of pliers make contact with corners (arrows B) of hose clamp.
- Tension hose clamp by turning spindle -A- with torque wrench (take care not to tilt pliers).
  - Tightening torque: 20 Nm

Notes:

- Make sure thread of spindle on pliers moves freely. Lubricate with MoS2 grease if necessary.
- If stiff, e.g. due to dirt on thread, required clamp tensioning force will not be attained with specified tightening torque.



-> Fig.6 Tensioning small clamp for rubber boot



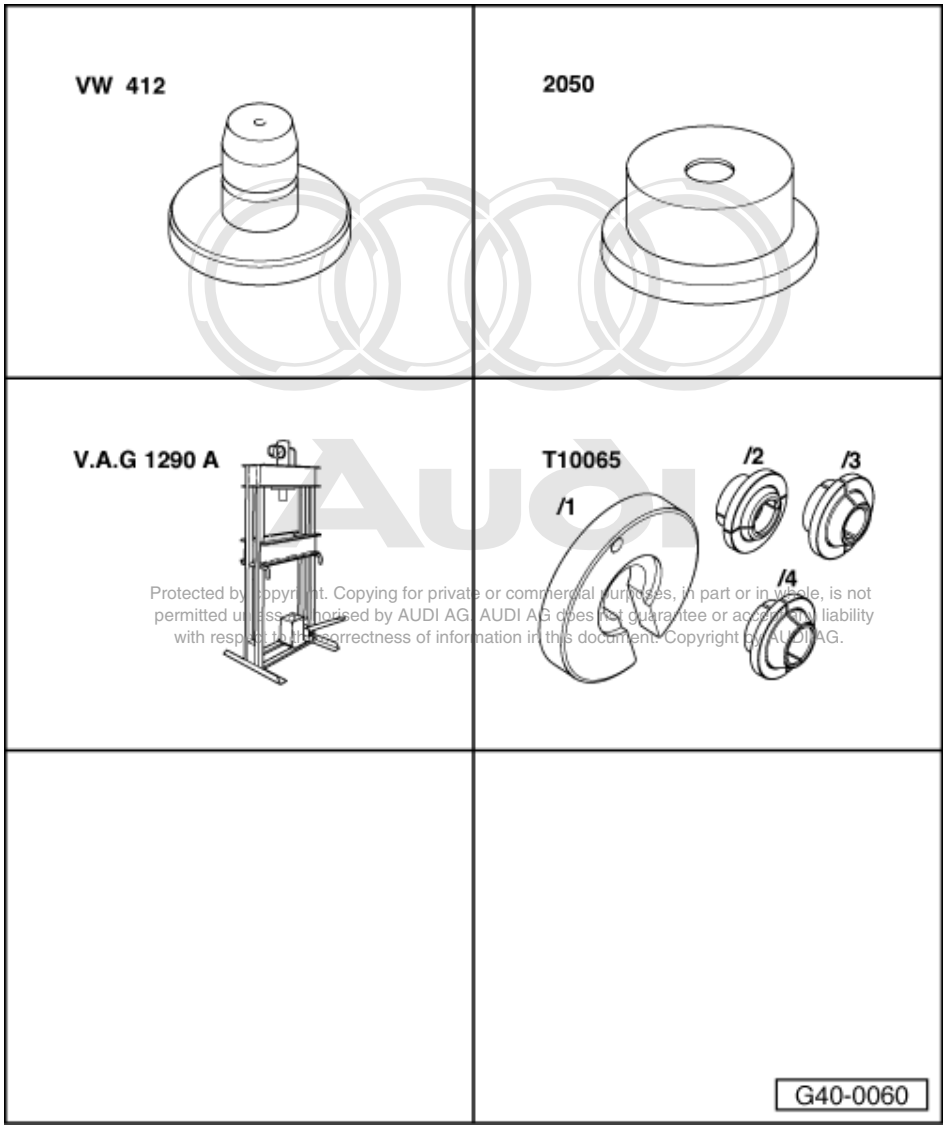
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Dismantling and assembling triple roller joint AAR 2900

Special tools and workshop equipment required

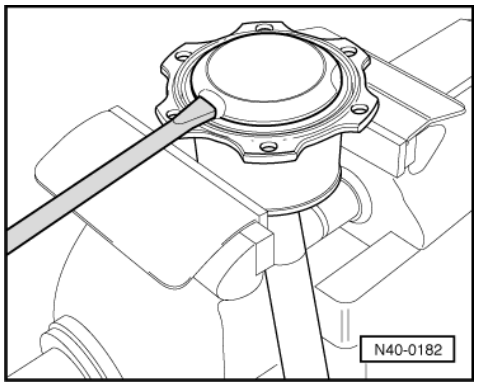
- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 408 A
- Press tool VW 411

- Tubular section VW 416 B
- Thrust pad VW 447 H



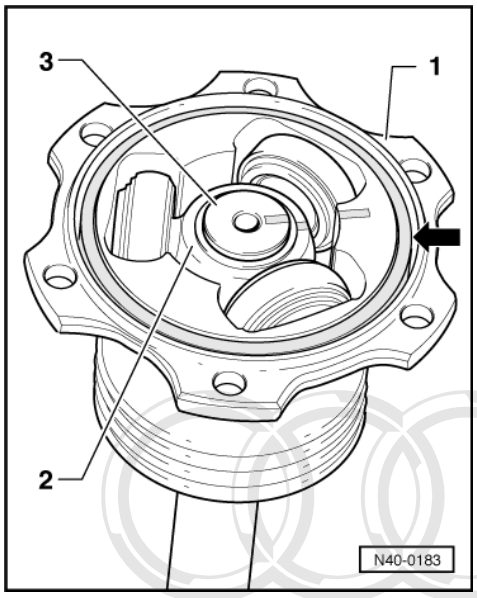
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- Press tool VW 412
- Thrust pad 2050
- Workshop press V.A.G 1290 A
- Assembly device T10065



Dismantling

- Unfasten clamp at shaft and push back boot.
- -> Drive slotted screwdriver or the like into cap and prise off cap.



- -> Mark installation position of components -1. . .3- using waterproof felt-tip pen.

1 - Joint element
2 - Triple roller star
3 - Drive shaft

Notes:

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- Marking is only necessary if rollers can be detached from triple roller star.
- Noise may subsequently be encountered whilst driving if components are not fitted in their original position on assembly.

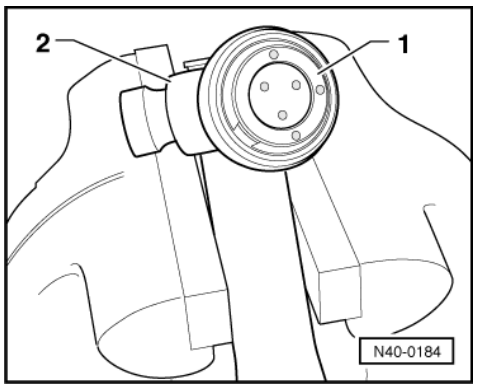
- Take rubber ring -arrow- out of groove.

- Grasp hold of joint element and take drive shaft out of vice.

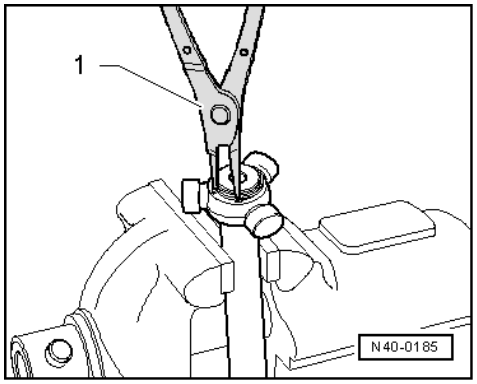
Note:

Make sure rollers do not slide off triple roller star and drop onto ground.

- Hold drive shaft with joint element in vertical position and then use other hand to slowly push back joint element.

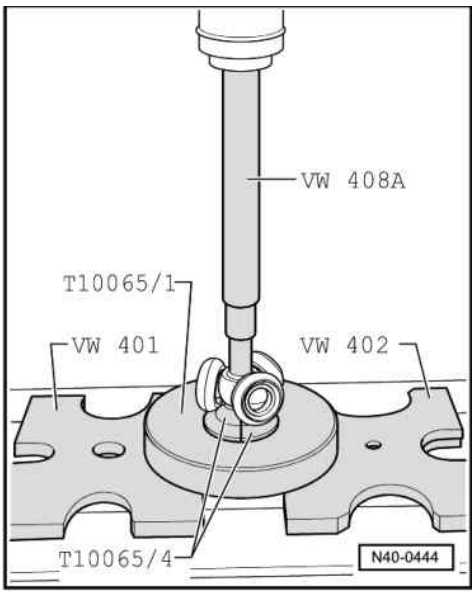


- -> Use felt-tip pen to mark installation position of rollers -1- with respect to triple roller star -2-.
- Detach rollers and set down on clean surface.



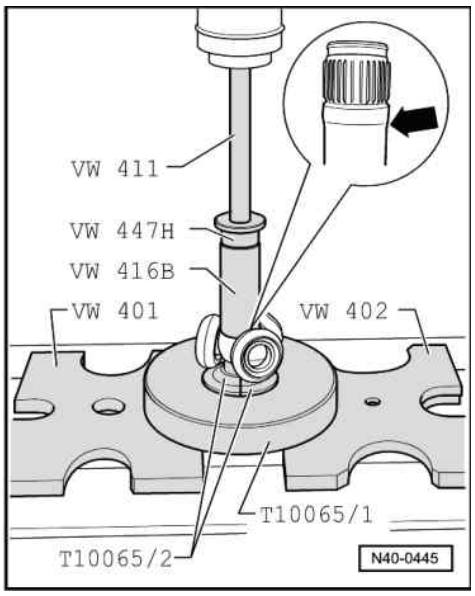
- -> Remove circlip.

1 - Pliers (commercially available) or VW 161 A



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- Insert drive shaft in press.
- -> Grasp hold of drive shaft and then press triple roller star off drive shaft.
- Detach joint element with boot from shaft.
- Clean shaft, joint element and groove for sealing ring.



Assembling

- Slip small clamp for boot onto shaft.
- Slip boot onto shaft.
- Slip joint element onto shaft.

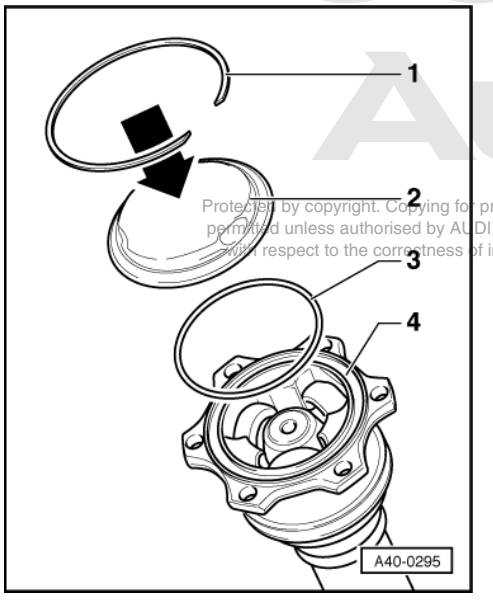
Fitting triple roller star

- Chamfer at star faces shaft and is used as an assembly aid
-> Attach triple roller star to shaft and press home.

Make sure pressure does not exceed 3.0 t!

- If necessary, coat splines of drive shaft and triple roller star with polycarbamide grease G 052 142 A2.
- Fit circlip, making sure that it is correctly positioned.
- Attach rollers to triple roller star in line with marks.
- Slip joint element over rollers and hold in position.

- Press 70 g of drive shaft grease from repair set into triple roller joint.
- Press 70 g of drive shaft grease from repair set into boot.
- Slip joint element over rollers and hold in position.

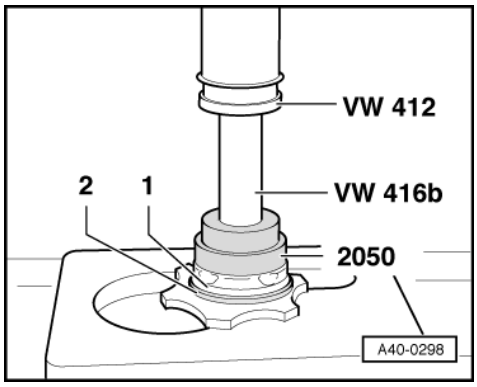


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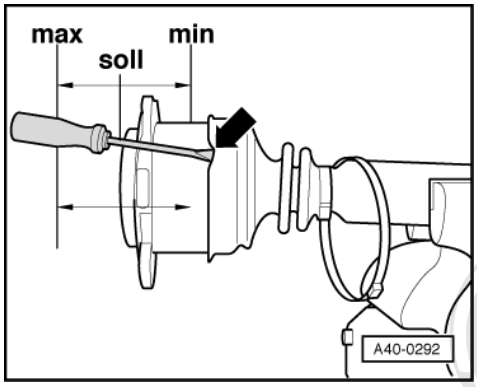
- -> Insert plain ring -3- from repair set in groove of triple roller joint -4-.

  1 - Circlip
  2 - Cap from repair set

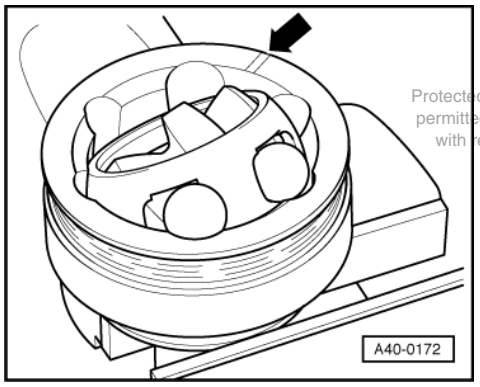
- Insert drive shaft in press.



- -> Press cap -1- into triple roller joint such that circlip can be inserted.
- Fit circlip, making sure that it is correctly positioned.
  - Circlip must be heard to engage



- Fit boot.
- -> Position triple roller joint roughly in centre of adjustment range (refer to distance between min. and max.).
- Hold triple roller joint in this position and lift boot -arrow-.
  - Any vacuum within boot can thus be dissipated
- Fit clamp.



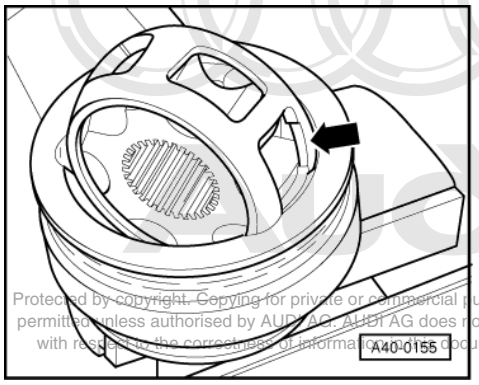
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Checking outer constant velocity joint

The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

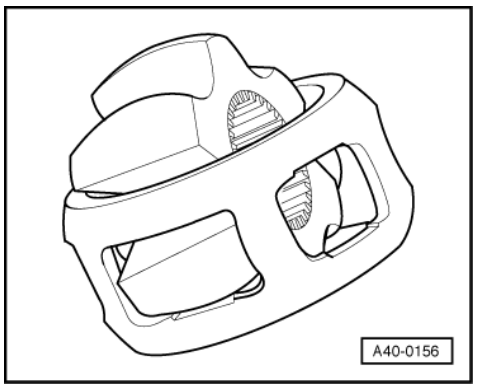
Removing

- -> Use electric scriber or whetstone to mark position of ball hub with respect to ball cage and housing before dismantling -arrow-.
- Swivel ball hub and ball cage and take out balls one after the other.



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- -> Turn cage until two cage openings (arrow) are in contact with joint housing.
- Lift out cage with hub.



- -> Swivel one hub segment into cage opening.
- Tip hub out of cage.

Notes:

- The 6 balls for each joint are of one tolerance group. Check stub axle, hub, cage and balls for pitting and signs of seizure.
- Excessive backlash in joint becomes apparent from load change jolts; joint is then to be replaced.
- Smooth areas and running marks on balls do not necessitate joint replacement.

Installing

Install in reverse order, paying attention to the following:

- Press half the total quantity of grease into the joint housing.
- Insert cage with hub in joint housing.

Note:

Cage must be inserted in correct position.

- Consecutively press in opposite balls, taking care to re-establish previous position of ball hub with respect to ball cage and joint housing.
- Insert new circlip in shaft.
- Distribute remaining grease in boot.

4.8 - Servicing drive shaft with triple roller joint AAR 3300i

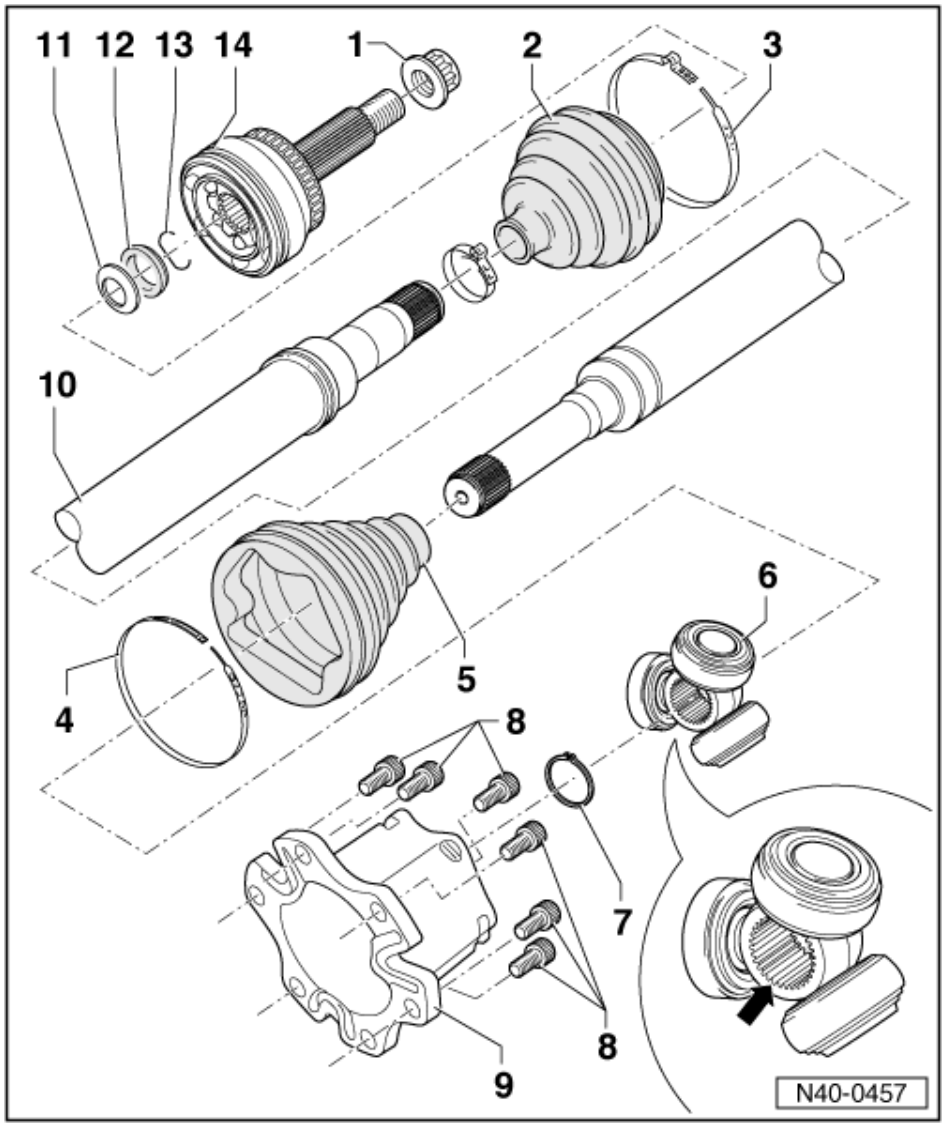
Grease fill of joints

Grease G 600.003	**Outer joint**
Total quantity	120 g
In joint	80 g
In boot	40 g
Grease G 000 605	**Triple roller joint**
Total quantity	130 g
In joint	80 g
In boot	50 g

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Note:

Re-grease joint on replacing boot.



Exploded view of components

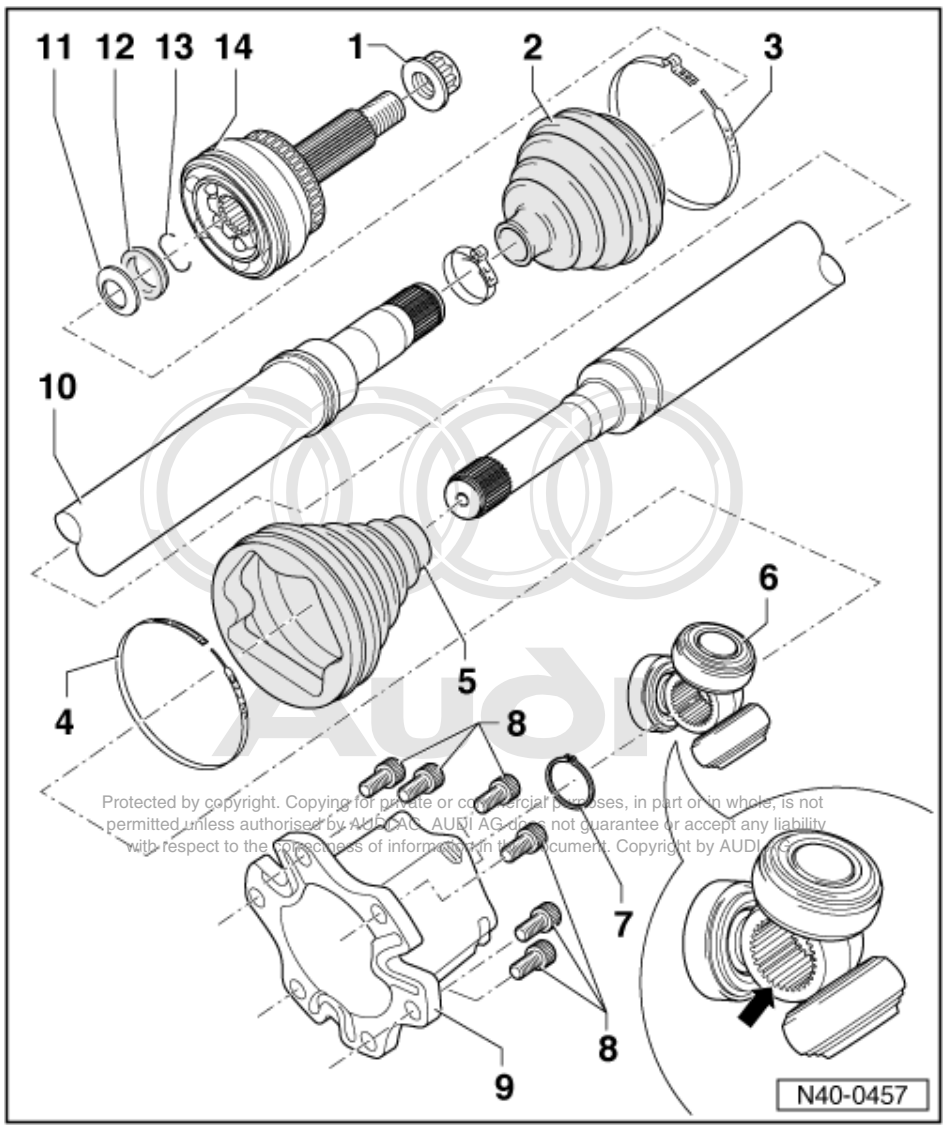
1 Twelve-point nut
- Self-locking
- Always replace after removing
- Unfastening and tightening
  => Page 108
- Remove any paint remnants and/or corrosion in thread of outer joint before screwing on nut

2 Boot for constant velocity joint
- Check for cracks and abrasion

3 Clamp
- Replace
- Tensioning => Fig. 5

4 Clamp
- Replace
- Tensioning => Fig. 4

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5 Boot for triple roller joint

- Check for cracks and abrasion

6 Triple roller star with rollers

- Chamfer -arrow- faces drive shaft splines

7 Circlip

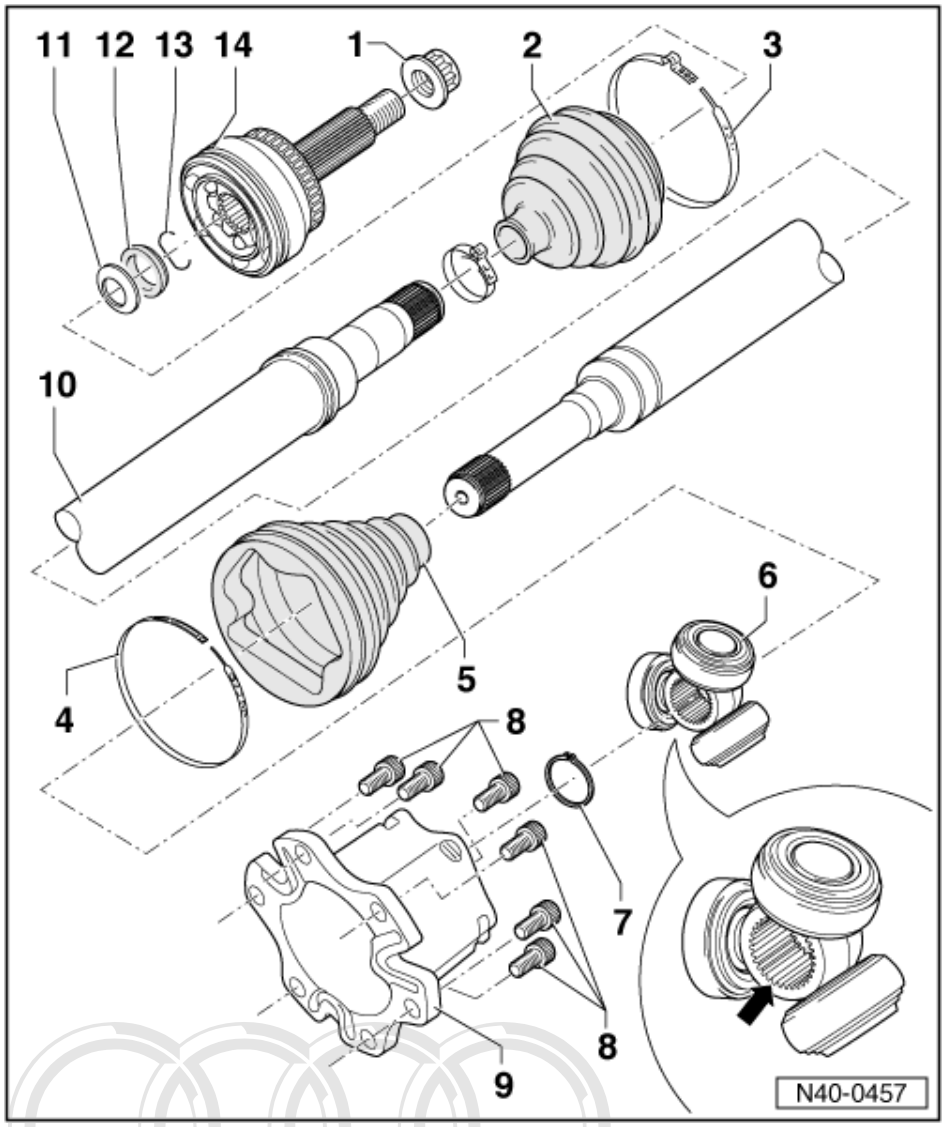
- Replace

8 Multi-point socket-head bolt

- Pre-tightening torque: 10 Nm
- Tightening torque for M8: 40 Nm
- Tightening torque for M10: 70 Nm

9 Joint element

10 Drive shaft



11 Dished washer

- Installation position => Fig. 2

12 Spacer ring (plastic)

- Installation position => Fig. 2

13 Circlip

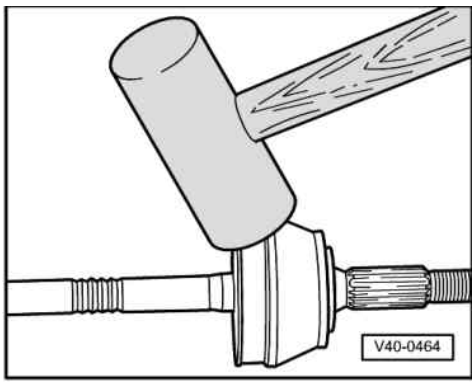
- Replace
- Insert in shaft groove

14 Outer constant velocity joint

- Replace only as complete assembly
- Removing => Fig. 1
- Checking =>Page 161
- Greasing =>Table, Page 152
- Installing:

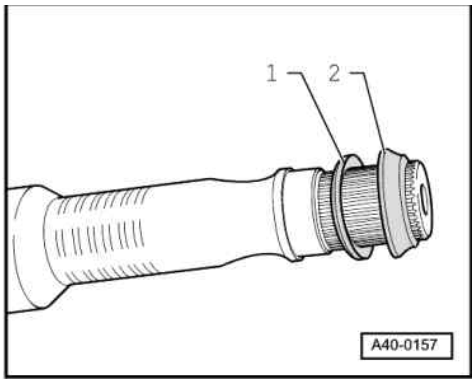
- Use plastic-headed hammer to drive joint onto shaft until circlip engages

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-> Fig.1 Removing outer constant velocity joint

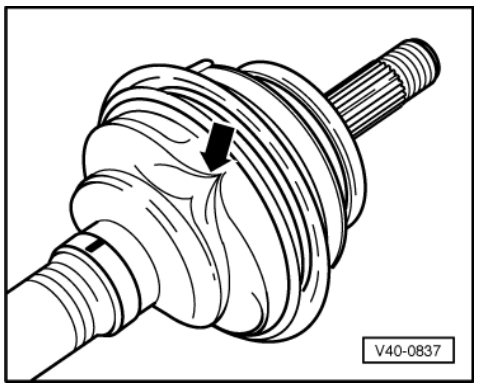
- Tap firmly with light alloy hammer to drive constant velocity joint off drive shaft.



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Fig.2 -> Installation position of spacer ring and dished washer

1 - Dished washer
2 - Spacer ring (plastic)

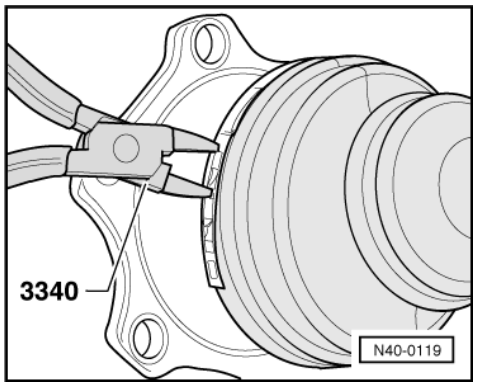


-> Fig.3 Venting rubber boot

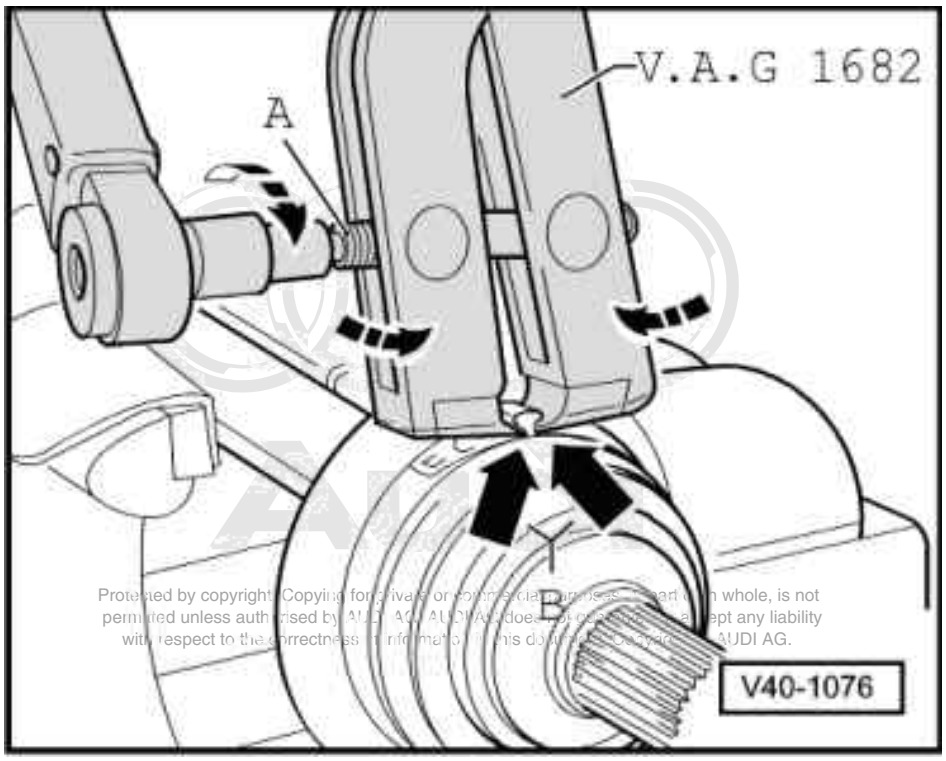
Boot is often squashed on positioning it on joint housing. This produces a vacuum in the boot, which causes a fold to form whilst driving -arrow-.

Attention is therefore to be paid to the following:

- Before tensioning clamps, lift boot to ensure pressure equalisation.



-> Fig.4 Tensioning large clamp for rubber boot

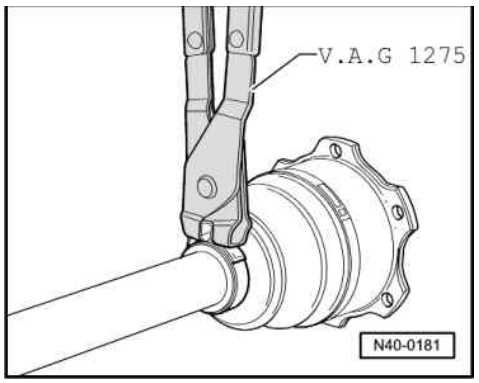


-> Fig.5 Tensioning stainless-steel clamps for Hytrel boots

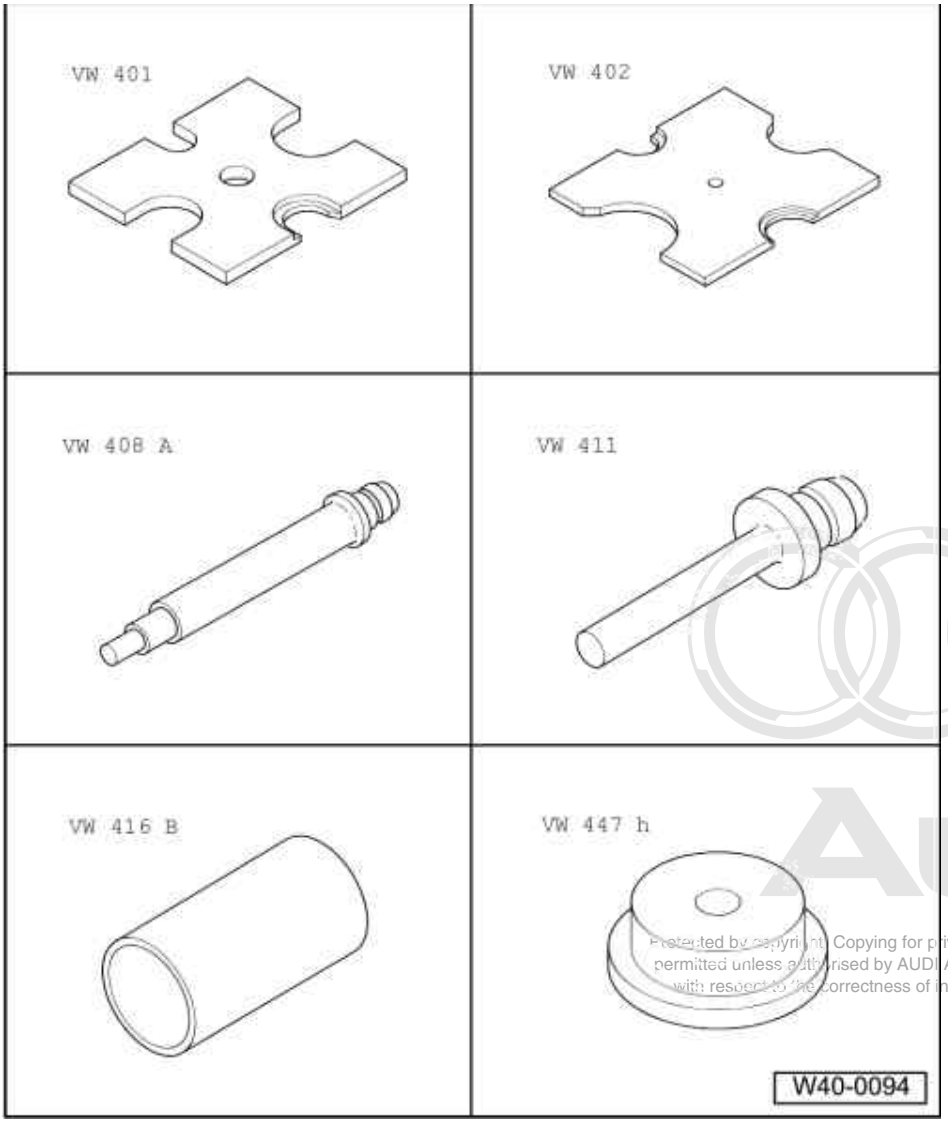
- Apply pliers V. A.G 1682 as shown. Make sure jaws of pliers make contact with corners (arrows B) of hose clamp.
- Tension hose clamp by turning spindle -A- with torque wrench (take care not to tilt pliers).
  - Tightening torque: 20 Nm

Notes:

- Make sure thread of spindle on pliers moves freely. Lubricate with MoS2 grease if necessary.
- If stiff, e.g. due to dirt on thread, required clamp tensioning force will not be attained with specified tightening torque.



-> Fig.6 Tensioning small clamp for rubber boot



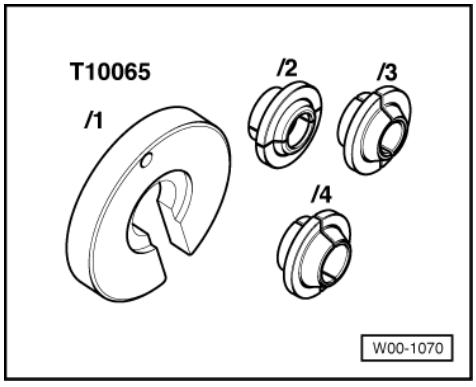
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Dismantling and assembling triple roller joint AAR 3300i

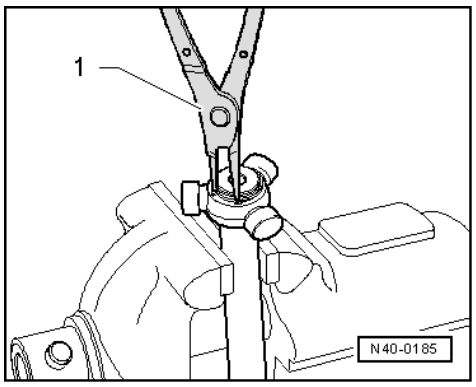
Special tools and workshop equipment required

- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 408 A
- Press tool VW 411

- Tubular section VW 416 B
- Thrust pad VW 447 H



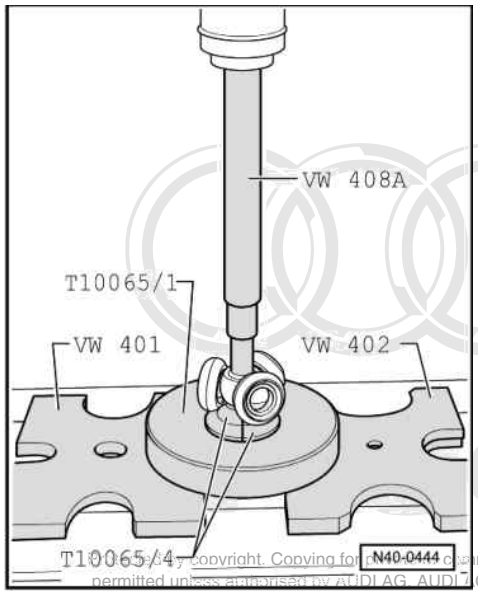
- Assembly device T10065



Dismantling

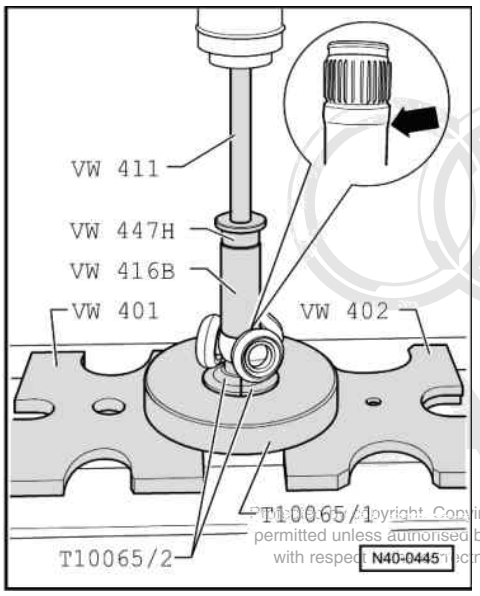
- Unfasten clamp at shaft and push back boot.
- Detach joint element from drive shaft.
- -> Remove circlip.

1 - Pliers (commercially available)
or VW 161 A



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- Insert drive shaft in press.
- -> Press triple roller star off drive shaft.
- Detach boot from shaft.
- Clean shaft, joint element and groove for sealing ring.



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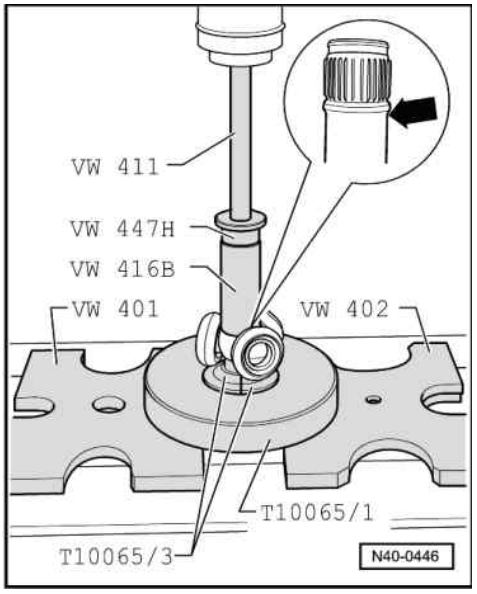
Assembling

- Slip small clamp for boot onto shaft.
- Slip boot onto shaft.
- Slip joint element onto shaft.

Fitting triple roller star - tapered drive shaft:

- Chamfer at star faces shaft and is used as an assembly aid

- -> Attach triple roller star to shaft and press home.



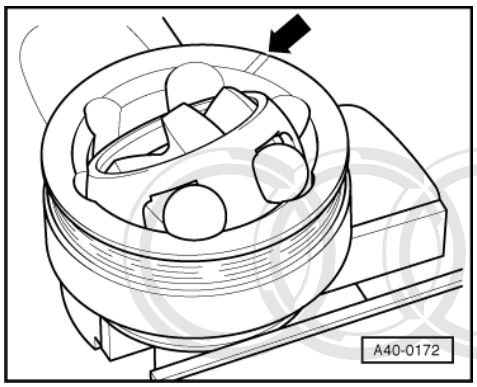
Fitting triple roller star - cylindrical drive shaft:

- -> Attach triple roller star to shaft and press home.

Both drive shaft versions (continued):

Make sure pressure does not exceed 3.0 t!

- If necessary, coat splines of drive shaft and triple roller star with polycarbamide grease G 052 142 A2.
- Fit circlip, making sure that it is correctly positioned.
- Slip joint element over rollers and hold in position.
- Press 70 g of drive shaft grease from repair set into triple roller joint.
- Press 60 g of drive shaft grease from repair set into boot.
- Fit boot.
- Fit clamp.



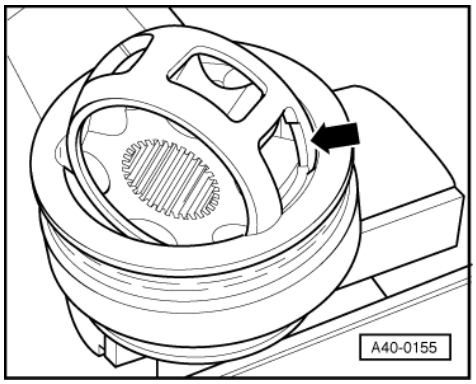
Checking outer constant velocity joint

The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

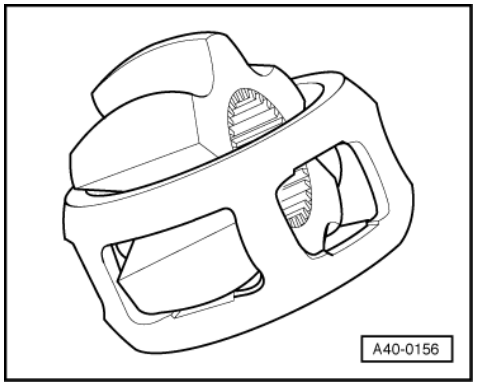
Removing

- -> Use electric scriber or whetstone to mark position of ball hub with respect to ball cage and housing before dismantling -arrow-.
- Swivel ball hub and ball cage and take out balls one after the other.

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- -> Turn cage until two cage openings (arrow) are in contact with joint housing.
- Lift out cage with hub.



- -> Swivel one hub segment into cage opening.
- Tip hub out of cage.

Notes:

- The 6 balls for each joint are of one tolerance group. Check stub axle, hub, cage and balls for pitting and signs of seizure.
- Excessive backlash in joint becomes apparent from load change jolts; joint is then to be replaced.
- Smooth areas and running marks on balls do not necessitate joint replacement.

Installing

Install in reverse order, paying attention to the following:

- Press half the total quantity of grease into the joint housing.
- Insert cage with hub in joint housing.

Note:

Cage must be inserted in correct position.

- Consecutively press in opposite balls, taking care to re-establish previous position of ball hub with respect to ball cage and joint housing.
- Insert new circlip in shaft.
- Distribute remaining grease in boot.

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42 - Rear suspension

1 - Servicing rear axle - Front-wheel drive vehicles

1.1 - Servicing rear axle - Front-wheel drive vehicles

General:

Load-bearing components and suspension components must not be welded or straightened.

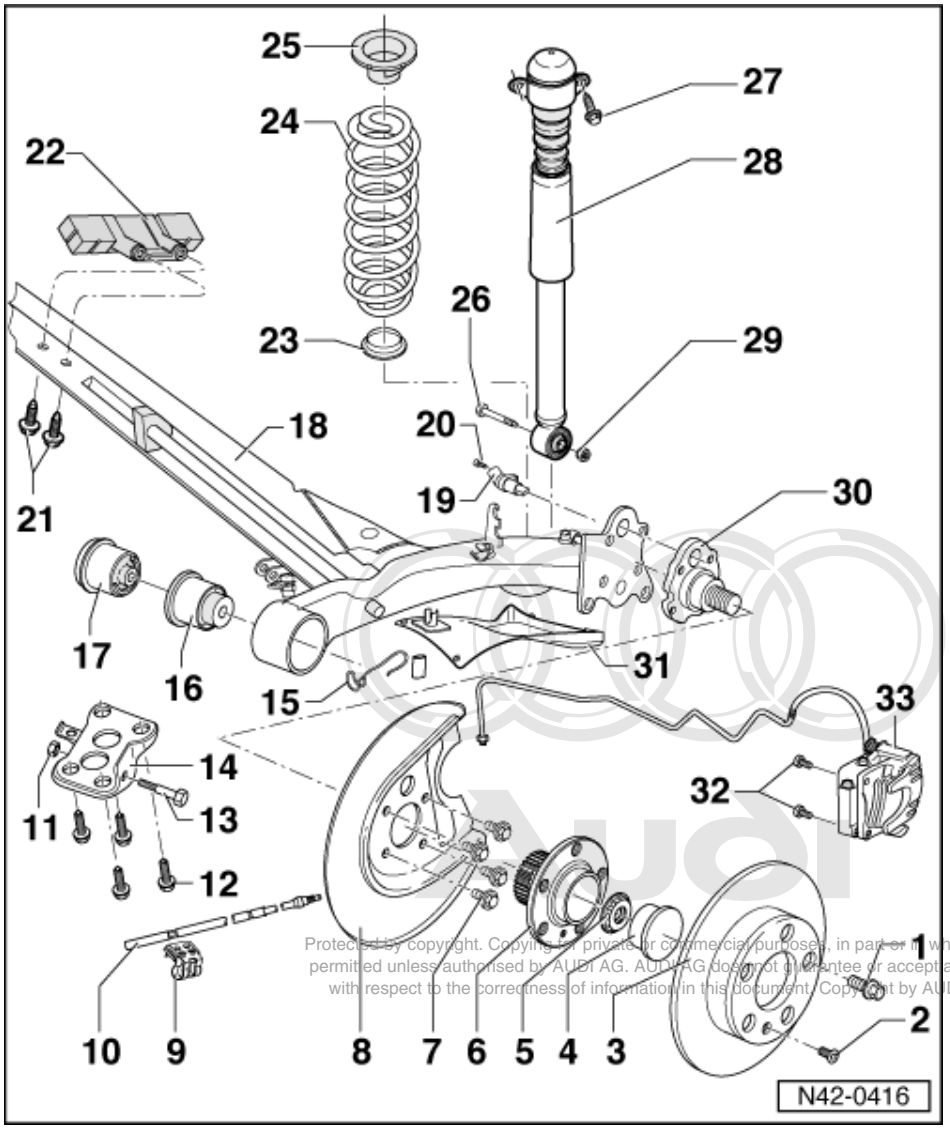
Bonded rubber bushes can only be turned to a limited extent. The bolted joints at the suspension links are therefore not to be tightened until the vehicle is standing on the ground.

If wheel alignment is subsequently to be performed on vehicle, bolts and nuts that need to be loosened for adjustment work are only to be tightened to torque. These bolts and nuts must then be tightened finally by turning through the specified angle on completion of wheel alignment/adjustment.

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Attention:
All bolts and nuts must be properly tightened on vehicles being used on public roads.

1.2 - Exploded view of rear axle components



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1 Wheel bolt

- Tightening method and torque
  => Page 273

2 Cross-head bolt

- Tightening torque:

=> Brake System; Repair Group 46

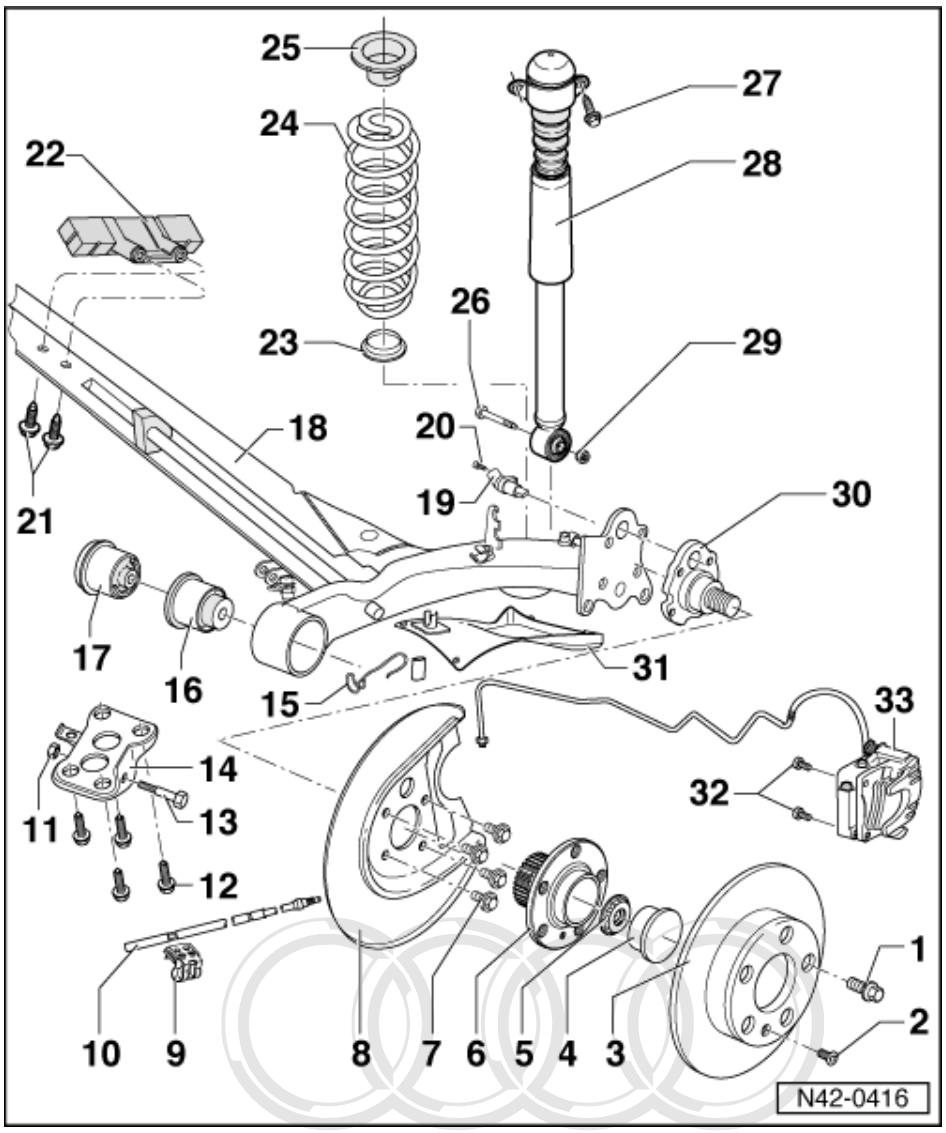
3 Brake disc

4 Grease cap

- Pressing off => Page 192
- Always replace after removing
- Driving in => Page 194

5 Twelve-point nut - 70 Nm + further 45° (1/8) turn

- Self-locking
- Always replace after removing



6 Wheel hub with wheel bearing
- Wheel bearing and wheel hub are fitted in a joint housing
- Wheel bearing/wheel hub unit is maintenance-free and there is no play; neither adjustment nor servicing work can be performed
- Pressing out and pressing in
=> Page 191

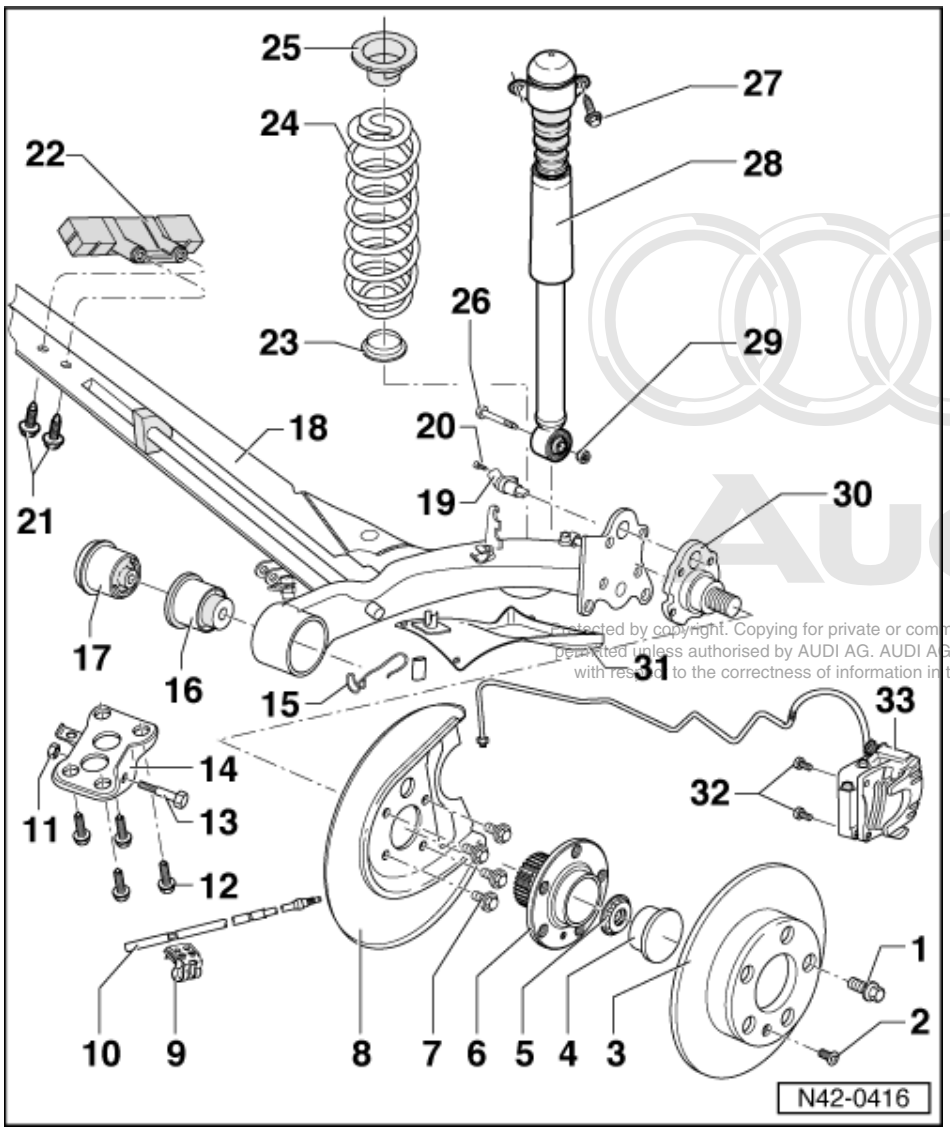
7 Bolt, 60 Nm
- Always replace after removing

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8 Splash plate

9 Holder for handbrake cable

10 Handbrake cable



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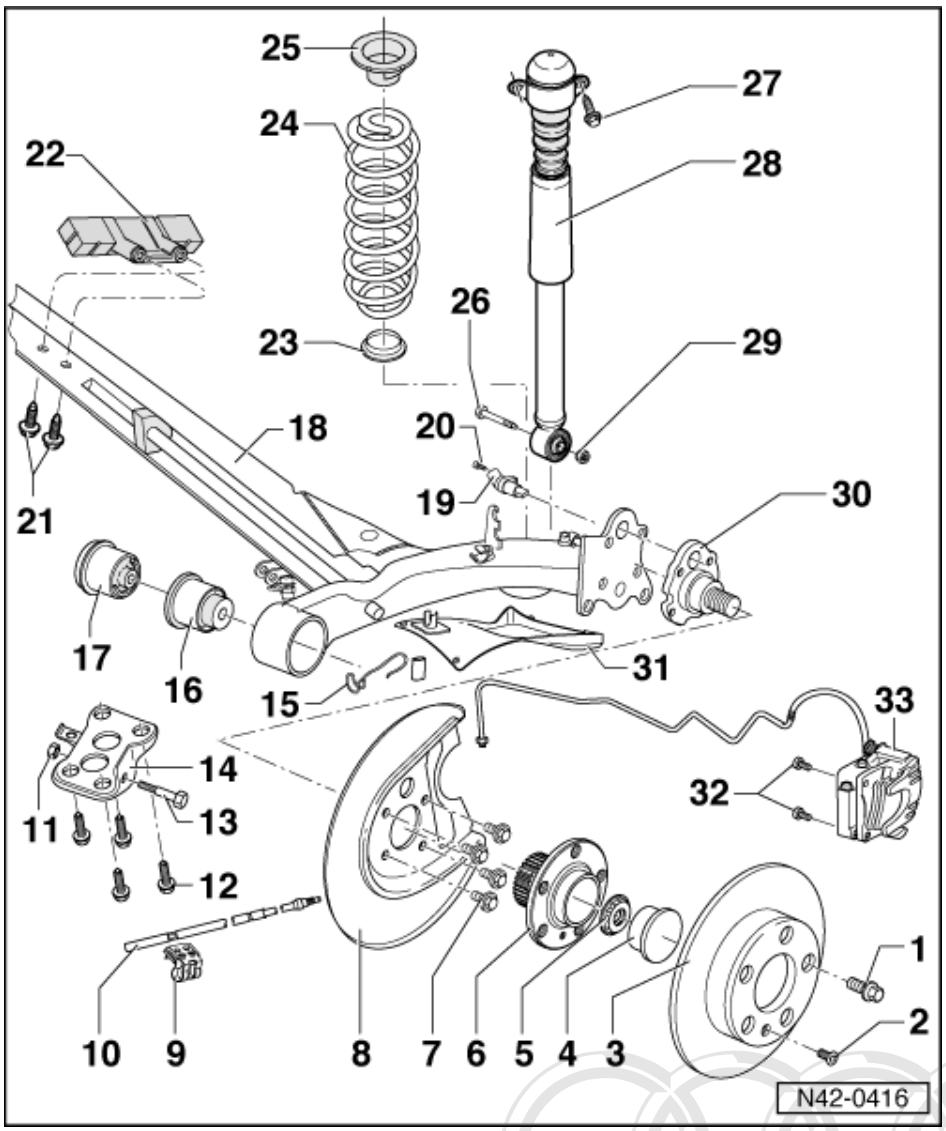
11 Nut, 80 Nm

- Self-locking
- Always replace together with bolt -Item 13 - after removing
- Rear axle must be in centre position when tightening nut (one person in rear of vehicle)

12 Bolt - 30 Nm + further 90° (1/4) turn

- Always replace after removing
- Thread in body can be repaired using threaded wire insert as per DIN 8140 (Heli-Coil) Threaded insert must be of same length as thread in body

Attention: Repair work using Heli Coil may only be performed at two nuts per side.



13 Bolt

- Always replace together with nut -Item 11 - after removing

14 Mounting bracket for rear axle

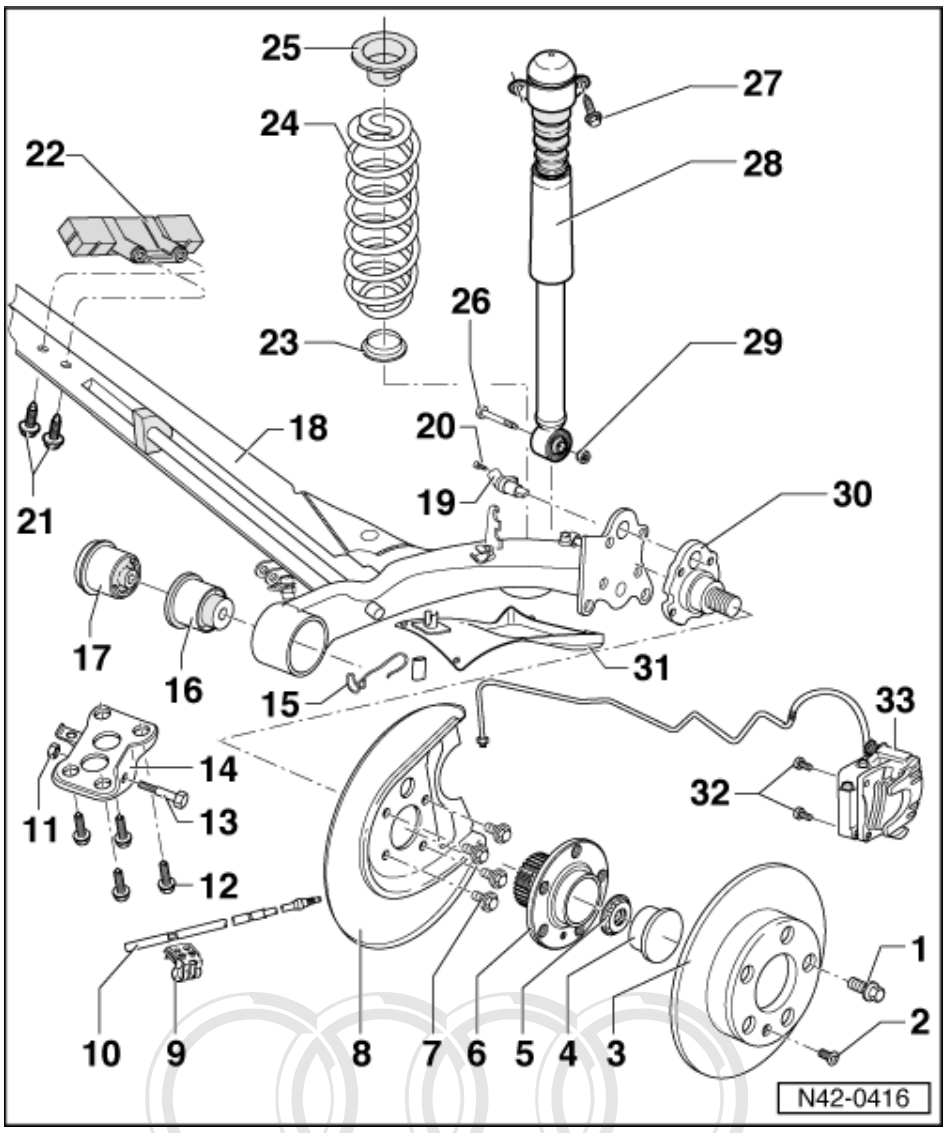
- After installation, check and if necessary adjust overall toe of rear axle
- Try to avoid unfastening when removing rear axle

15 Holder for handbrake cable

16 Bonded rubber bush

- Up to Model Year 2000
- Replacing => Page 176
- Lubricate bush in kidney-shaped area with lithium grease G 052 150 A2

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17 Hydraulic bonded rubber bush

- As of Model Year 2001
- Splits and/or oil stains in rubber section indicate wear
- Removing and installing
  => Page 179

18 Rear axle

- Contact surface and tapped holes for stub axle free from paint and dirt
- Removing and installing rear axle
  => Page 174

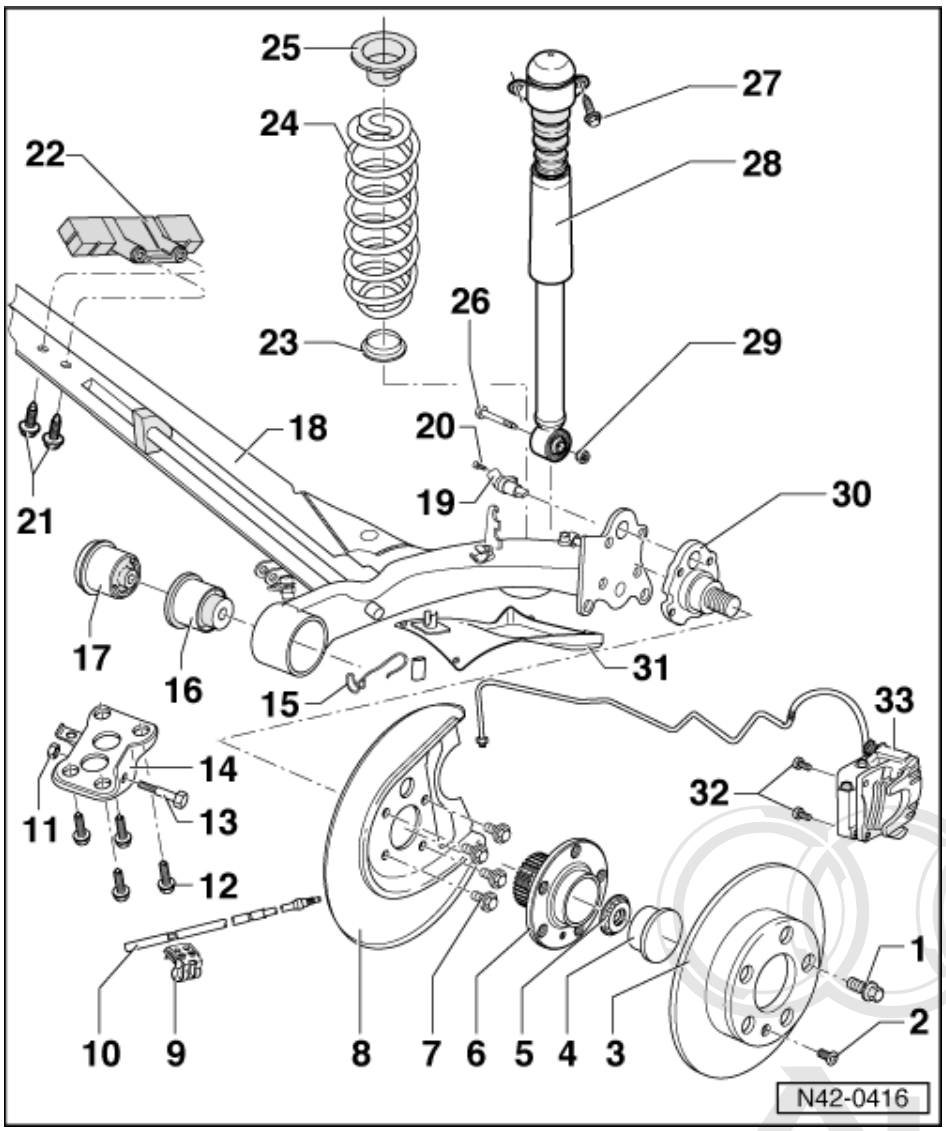
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19 Speed sensor

20 Hexagon socket-head bolt

- Tightening torque:

=> Brake System; Repair Group 45



21 Bolt - 20 Nm + further 45° (1/8) turn

- Always replace after removing

22 Vibration damper

- Not always fitted
- Always replace after removing

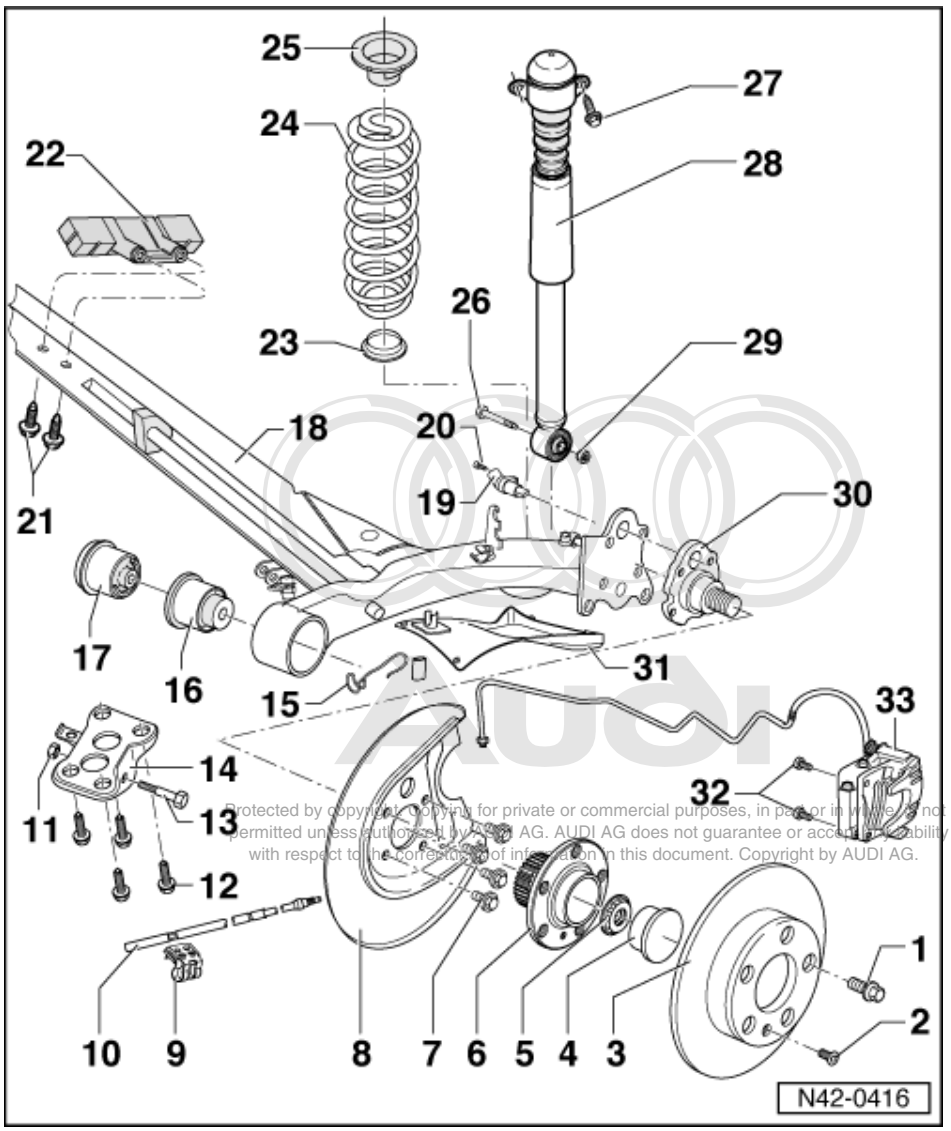
23 Zinc seat

- Replace if damaged

24 Coil spring

- Assignment to vehicle => Vehicle data sticker, Page 1
- Observe colour coding
- Check for paint damage and repair any damage
- Removing and installing=>Page 184

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25 Spring support

- Installation position => Page 186

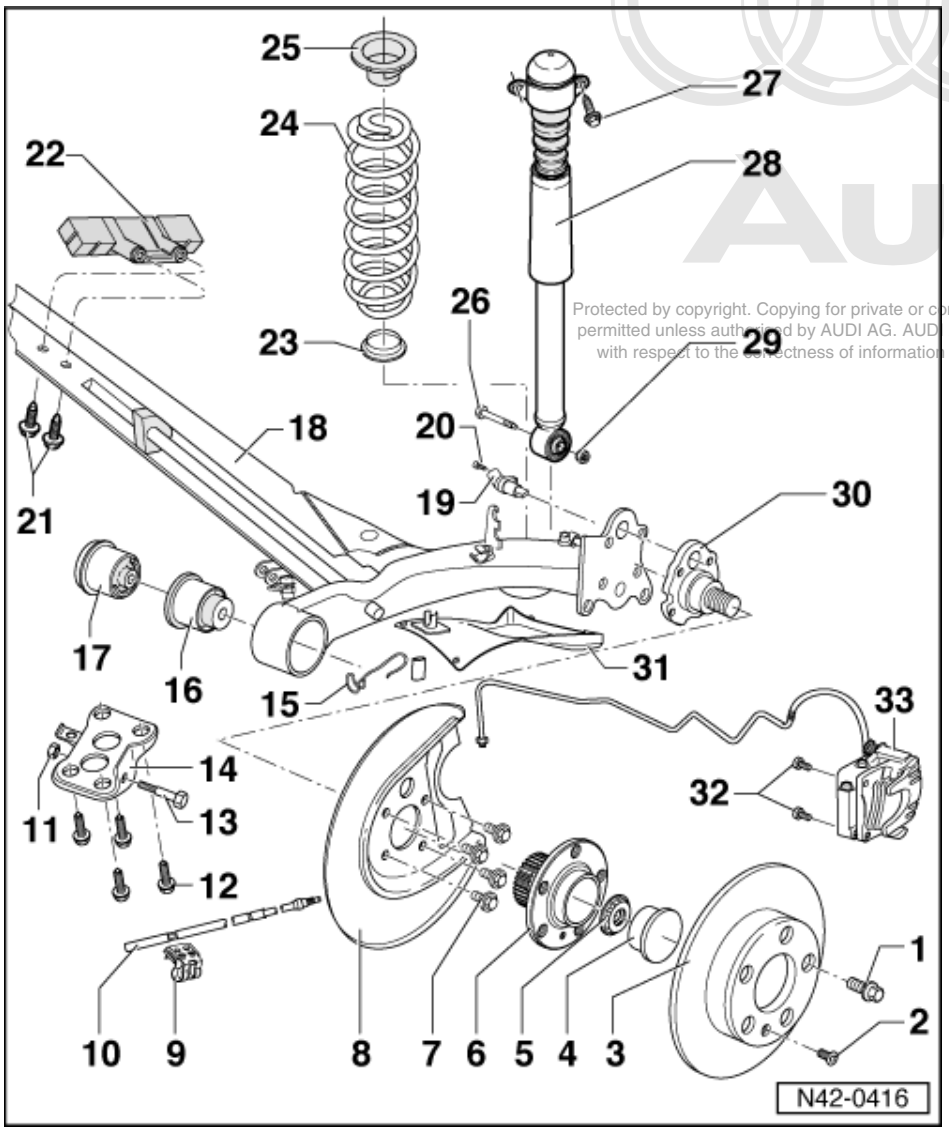
26 Bolt

- Always replace together with nut -Item 29 - after removing

27 Bolt - 30 Nm + further 90° (1/4) turn

- Always replace after removing
- Thread in body can be repaired using threaded wire insert as per DIN 8140 (Heli-Coil) Threaded insert must be of same length as thread in body

Attention: Repair work using Heli Coil may only be performed at one nut per side.



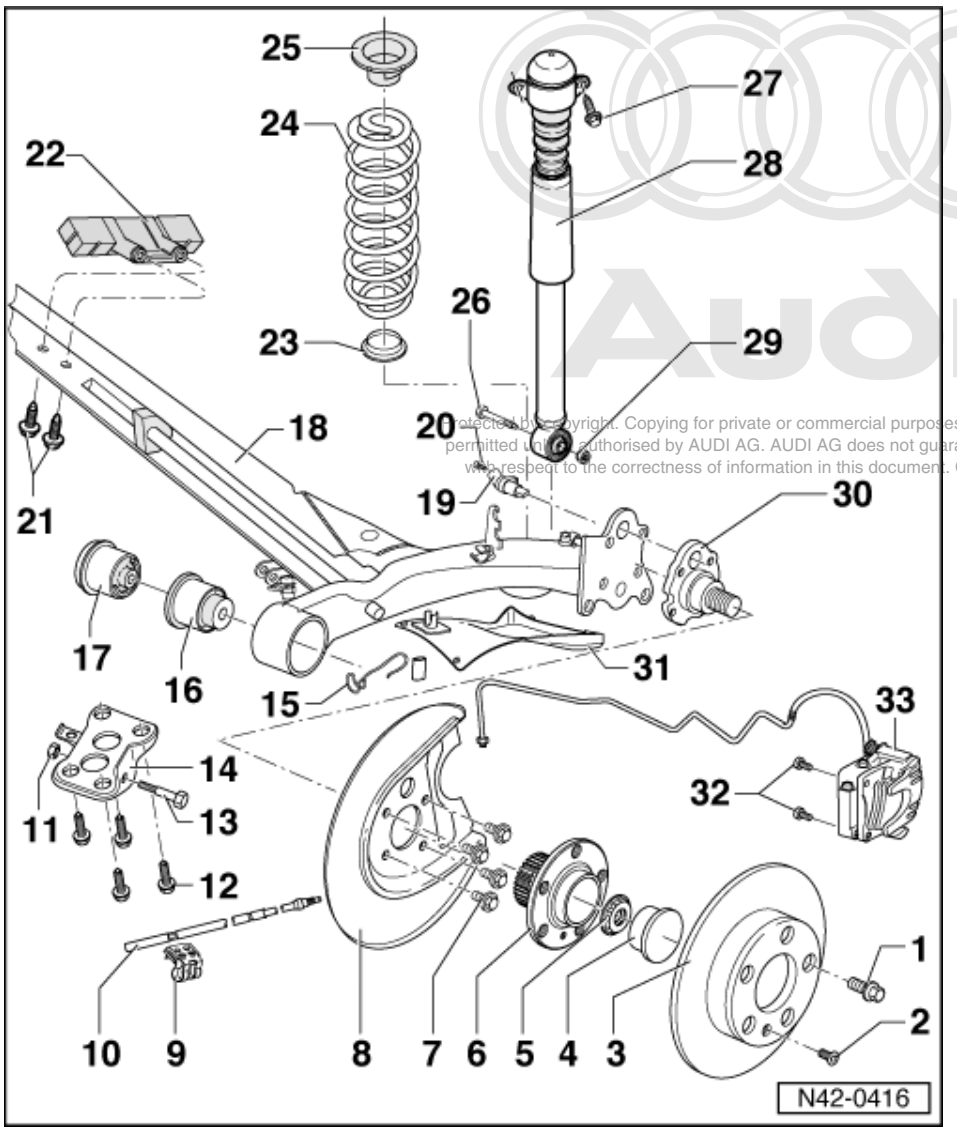
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28 Shock absorber

- Can be replaced separately
- Assignment to vehicle => Vehicle data sticker, Page 1
- Checking shock absorber for leaks => Page 7
- Checking shock absorber following removal => Page 8
- Removing and installing=>Page 184

29 Nut - 40 Nm + further 90° (1/4) turn

- Self-locking
- Always replace together with bolt -Item 26 - after removing
- Vehicle must be standing on ground when tightening nut



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30 Stub axle

- Straightening work is not permitted
- Thread is not to be re-cut

31 Stone deflector

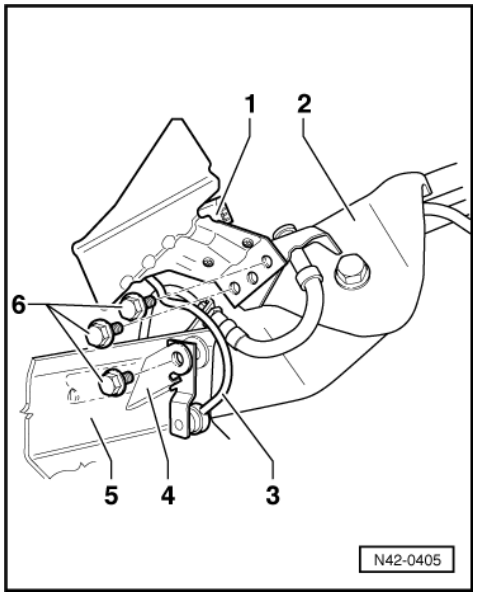
32 Hexagon socket-head bolt

- Tightening torque:

=> Brake System; Repair Group 46

33 Brake caliper

1.3 - Vehicle level sender -G76 for headlight range control



1 - -> Vehicle level sender -G76
2 - Mounting bracket
3 - Connecting link
4 - Bracket
5 - Rear axle
6 - Bolt, 20 Nm

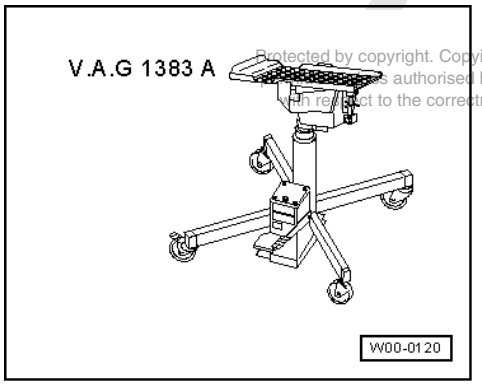
Note:

Headlight basic setting is always required after performing installation work on vehicle level sender.

Headlight basic setting

=> Electrical System, Self-diagnosis; Repair Group 01

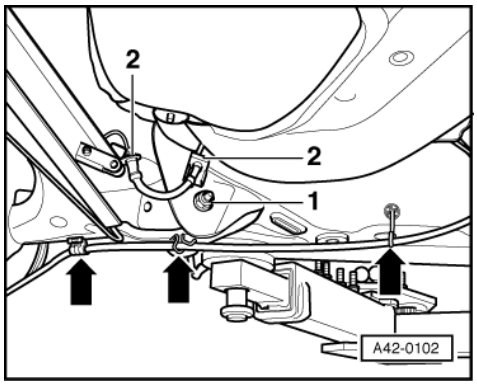
1.4 - Removing and installing rear axle



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Special tools and workshop equipment required

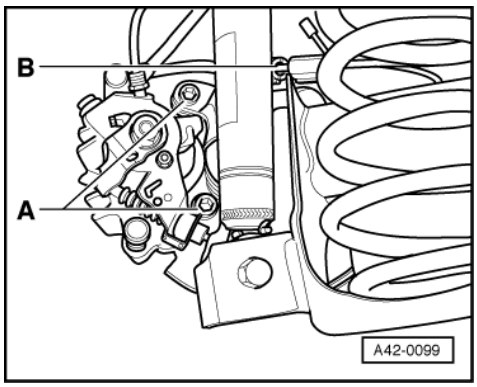
- Engine/gearbox lifter V.A.G 1383 A



Removing

Mounting bracket is not to be unscrewed to remove rear axle.

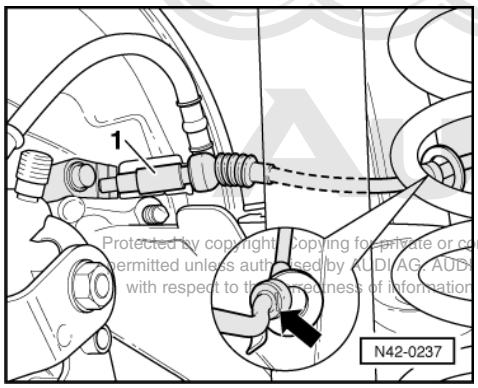
- Remove rear wheels.
- -> Unclip brake cables -arrows-.
- Unfasten clips -2- of brake hose holder and disconnect brake pipes (seal pipes with plugs).



- -> Screw out bolts -A-.
- Detach brake caliper and hang up with piece of wire.

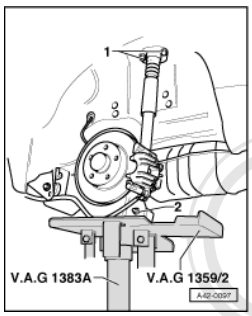
Note:

Brake hose/pipe is never to be twisted or kinked.

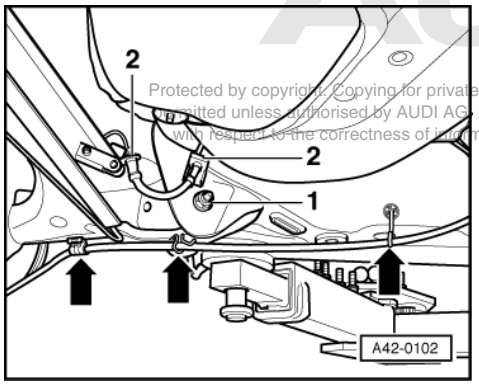


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- -> Unplug connector -1- of ABS speed sensor.
- Unclip speed sensor wire from holder -arrow-.



- Use engine/gearbox lifter V.A.G 1383 A to provide support for rear axle at shock absorber mount.
- -> Unscrew bolt - 2 - on left and right.
- Lower engine/gearbox lifter and take out coil spring.



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- Use engine/gearbox lifter V.A.G 1383 A to provide support for rear axle at axle beam.
- -> Unscrew bolts -1- for mounting bracket at rear axle on either side and lower rear axle.

Installing

Install in reverse order, paying attention to the following:

- Before fitting rear axle on vehicles up to Model Year 2000, fill kidney-shaped cavities of bonded rubber bushes with lithium grease G 052 150 A2.
- Fit brake caliper.

=> Brake System; Repair Group 46

- Fill and bleed brake system.

=> Brake System; Repair Group 47

Tightening torques

Component	Nm
Shock absorber to rear axle	40 + 90° 1)2)
Rear axle to mounting bracket	80 1)

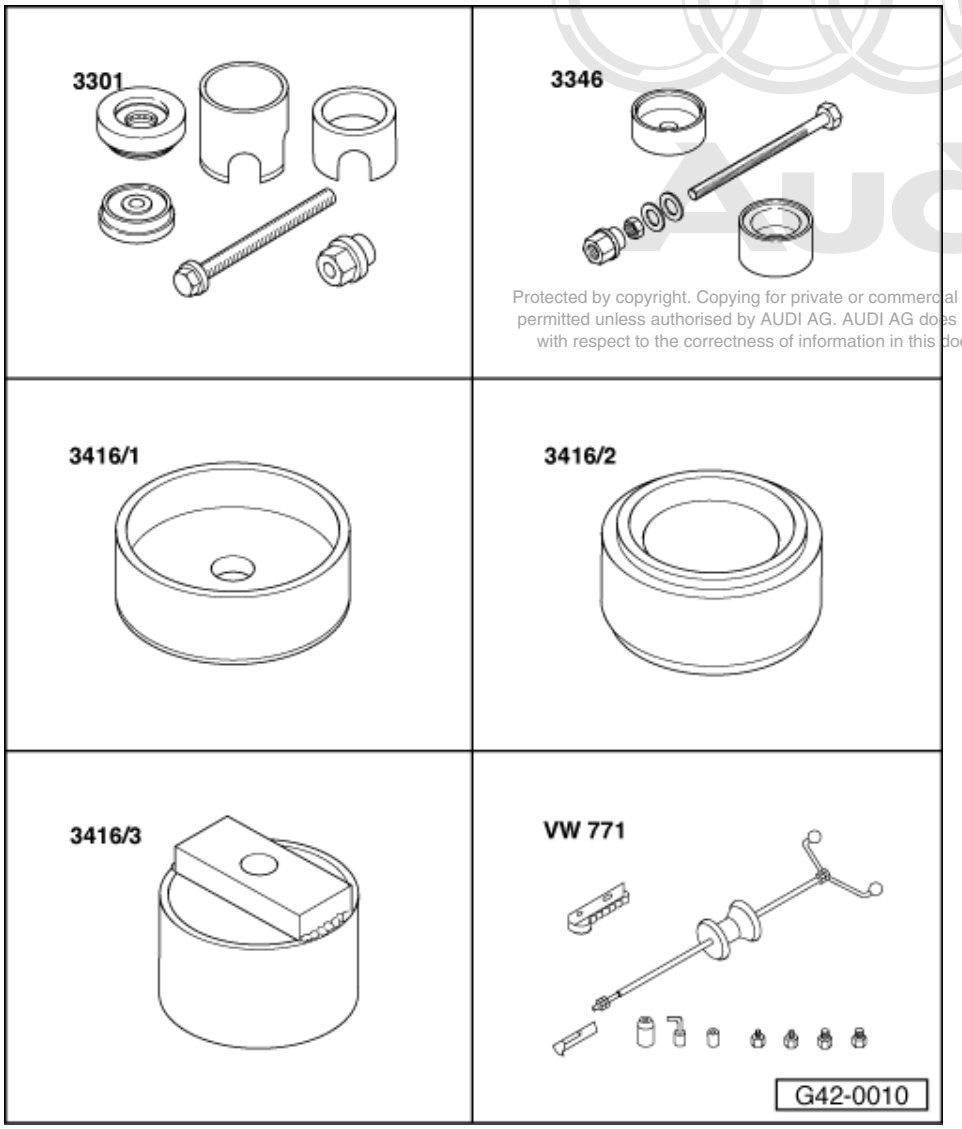
1) 90°corresponds to quarter turn

2) Replace bolts and nuts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

Perform wheel alignment after installation.

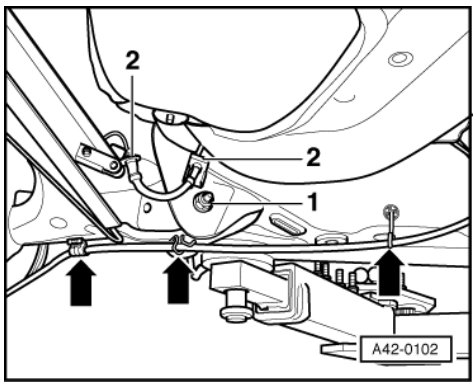
1.5 - Replacing bonded rubber bush



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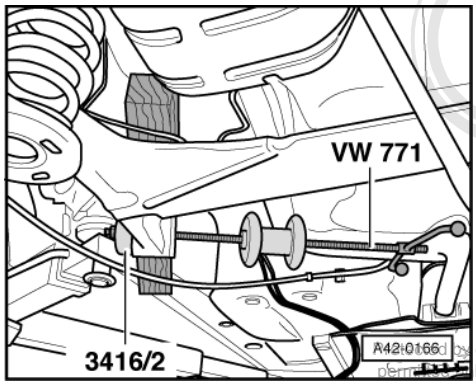
Special tools and workshop equipment required

- Assembly device 3301
- Assembly device 3346
- Thrust pad 3416/1
- Thrust pad 3416/2
- Tubular support 3416/3
- Multi-purpose tool VW 771



Removing

- Remove rear wheels.
- -> Unclip brake cables -arrows-.
- Unfasten clips -2- at brake hose holders.
- Screw out hexagon bolt -1- of guide bearing.

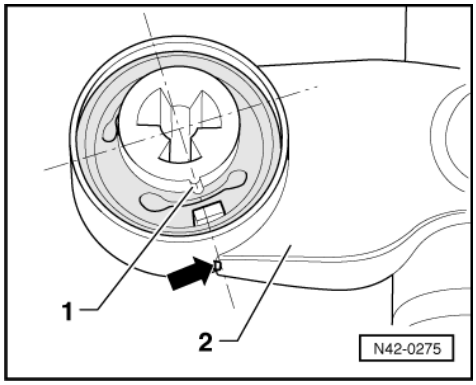


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Note:

Place roughly 10 cm thick wooden block between rear axle and body to permit application of multi-purpose tool VW 771.

- -> Apply special tools shown and remove bush by turning spindle.



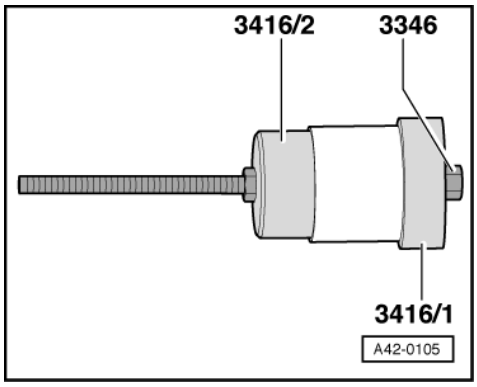
Installing

Install in reverse order, paying attention to the following:

-> Bonded rubber bush is provided with marks -1- on end face. When fitted, these marks must be aligned with edge -arrow- of trailing arm -2-.

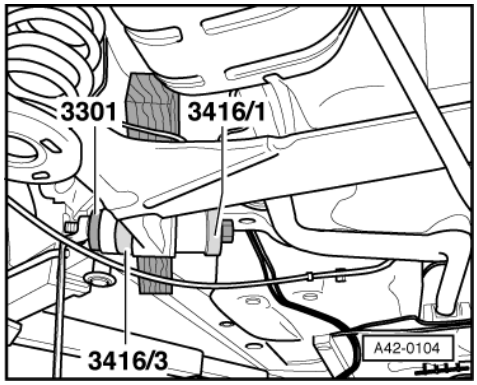
Note:

Mark position of marks -1- on outside of bonded rubber bush, as marks are subsequently concealed by special tool.



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- -> Fit special tools on bonded rubber bush.



- -> Then place bonded rubber bush and special tools in position at rear axle.
  - Make sure mark is aligned with edge of trailing arm
- Fit bonded rubber bush by turning spindle.
- After fitting, check installation position of bonded rubber bush.
- Before fitting rear axle on vehicles up to Model Year 2000, fill kidney-shaped cavities of bonded rubber bushes with lithium grease G 052 150 A2.

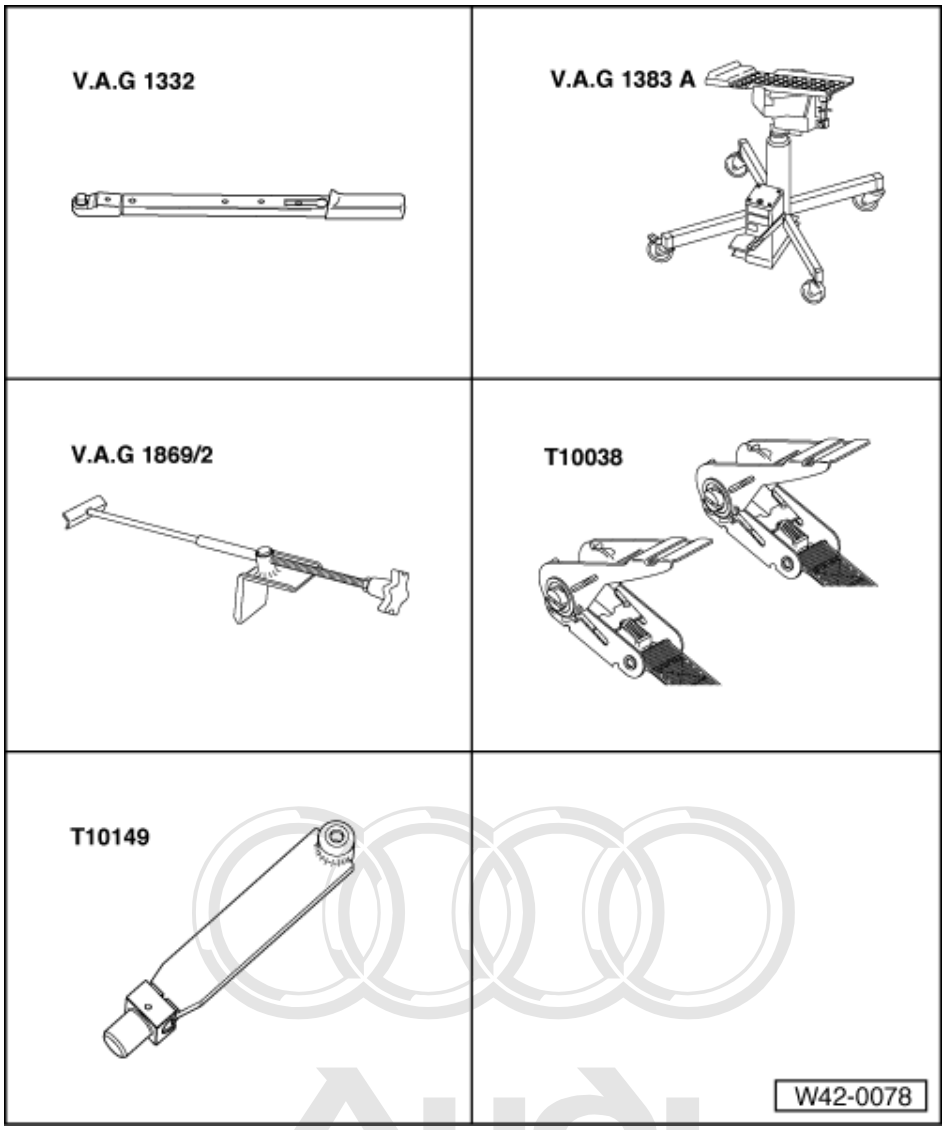
Tightening torque

Component	Nm
Rear axle to mounting bracket	80 1)

1) Replace bolts and nuts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

1.6 - Removing and installing hydraulic bonded rubber bush



Special tools and workshop equipment required

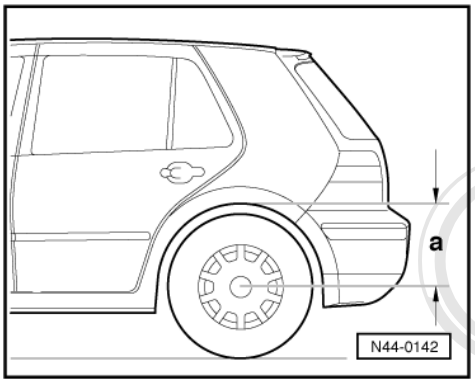
- V.A.G 1332 Torque wrench
- V.A.G 1383 A Engine/gearbox jack with universal gearbox support V.A.G 1359/2
- V.A.G 1869/2 Brake pedal actuator
- T10038 Tensioning strap
- T10149 Support
- VAS 6178 Pump
- VAS 6179 Cylinder
- VAS 6180 Assembly device

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Install only "conventional" bonded rubber bushes when hydraulic bonded rubber bushes have been removed.

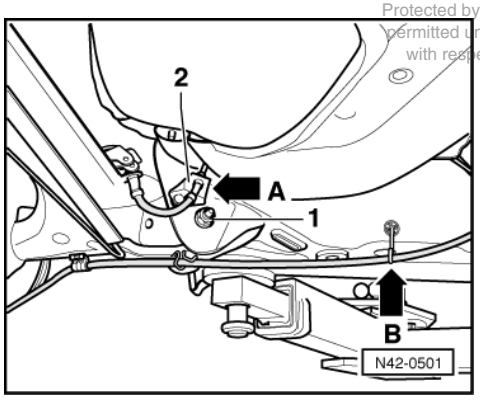
Replacement must be performed on both sides of the vehicle. Mixed installation of the different types of bushes on the same vehicle is not permissible.

Removing

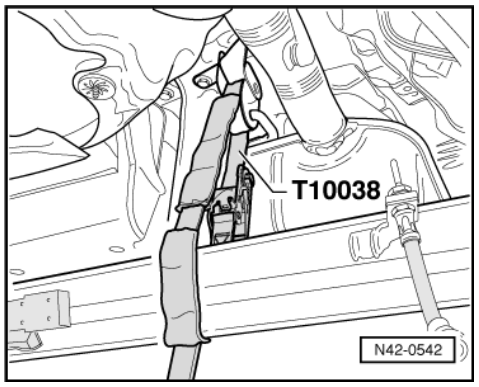


- -> Using a tape measure or similar, measure distance -a- from centre of wheel to lower edge of wheel housing.
- Make a note of this measurement; it is required when tightening bolts securing rear axle to mounting bracket.
- Fit brake pedal actuator V.A.G 1869/2.
- Lift vehicle to working height.
- Remove wheels.

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- -> Disconnect brake lines -arrow A- and take out clips.
- Pull left brake hose out of bracket -2-.
- Pull right brake hose out of rear axle.
- Remove handbrake cables from brackets -arrow B-.
- Place gearbox jack V.A.G 1383 A under vehicle.
- Remove bolt -1- securing mounting bracket to rear axle on both sides.
- Lower rear axle with gearbox jack V.A.G 1383 A.



- -> Secure rear axle to exhaust mountings using tensioning strap T10038.

Vehicles with dynamic headlight range control

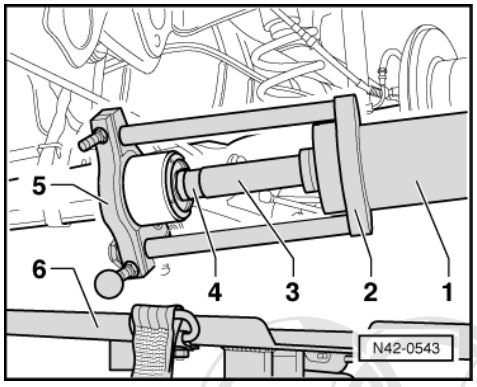
- Detach connecting link for vehicle level sender -G76 from rear axle=>Page 173 .

Continued for all vehicles

Note:

Place engine/gearbox jack V.A.G 1383 A with universal gearbox support V.A.G 1359/2 under suspension link (to prevent risk of accidents caused by parts dropping when bush is pulled out).

Pressing out core of hydraulic bonded rubber bush



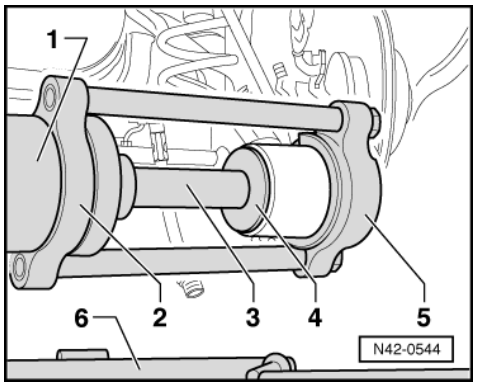
- -> Set up special tools on rear axle as shown.
- Put a plastic bag over the special tools and suspension link to catch escaping fluid immediately when bush is pressed out.
- Press out core of bonded rubber bush.

1 - VAS 6179
2 - VAS 6180/1
3 - VAS 6180/4 (long)
4 - VAS 6180/3
5 - VAS 6180/2
6 - V.A.G 1383 A with V.A.G 1359/2

Notes:

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- The jaws of splitter VAS 6180/2 must engage between collar of bonded rubber bush and bush of suspension link.
- The marking "Top" on splitter VAS 6180/2 must face towards suspension link.



Pressing out sleeve of hydraulic bonded rubber bush

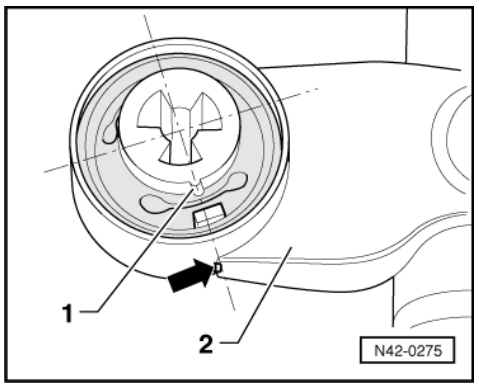
- -> Press out sleeve

1 - VAS 6179
2 - VAS 6180/1

3 - VAS 6180/4 (long)
4 - VAS 6180/5
5 - VAS 6180/8
6 - V.A.G 1383 A with V.A.G 1359/2

Note:

The marking "Top" on VAS 6180/2 must face towards suspension link.



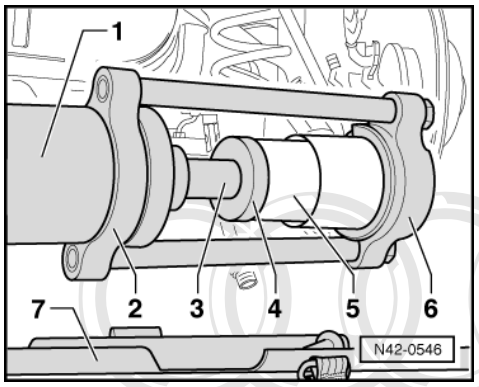
Installing

Use only "conventional" bonded rubber bushes when installing

-> End face of bonded rubber bush has markings -1-.

These markings must line up with the edge -arrow- on the trailing arm -2-.

- Mark position of markings -1- on circumference of bonded rubber bush.



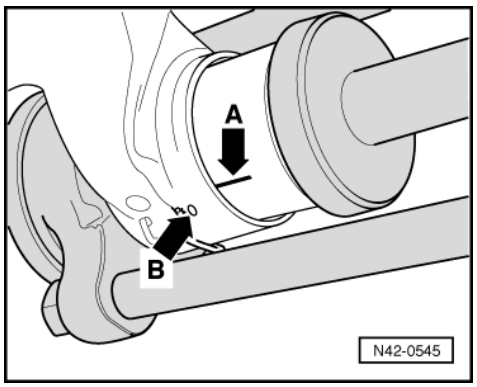
- -> Now bring bonded rubber bush and special tools into position on rear axle.

1 - VAS 6179
2 - VAS 6180/1
3 - VAS 6180/6
4 - VAS 6180/7
5 - Bonded rubber bush
6 - VAS 6180/8
7 - V.A.G 1383 A with V.A.G 1359/2

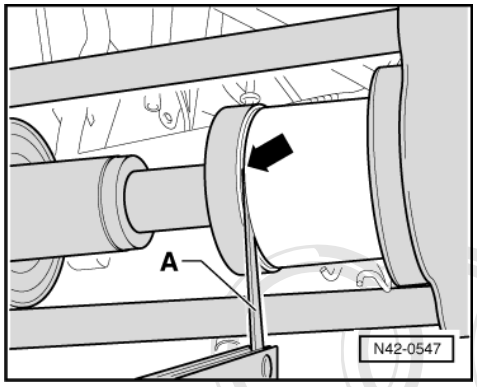
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Note:

The marking "Top" on VAS 6180/2 must face towards suspension link.



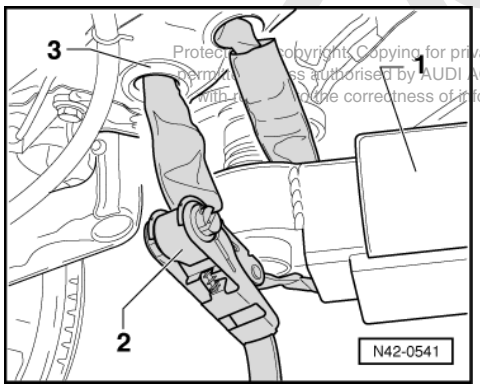
- -> Before pressing in the bonded rubber bush, make sure that the previously made marking -arrow A- lines up with the edge -arrow B- on the trailing arm.



- -> Press in bonded rubber bush until the remaining gap -arrow- is 0.2 mm.
- Measure this gap -arrow- with a feeler gauge -A-.
- Check position of bush after installation.

Securing vehicle to lifting platform

There is a risk of the vehicle slipping off the lifting platform if it is not secured properly.



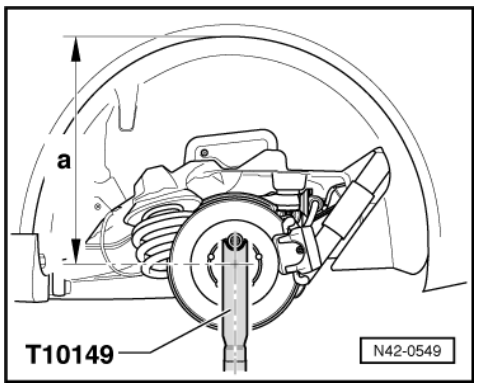
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- -> Remove plugs from longitudinal member -3- and tighten tensioning strap.

  1 - Arm of lifting platform
  2 - Tensioning strap T10038
  Vehicle must be secured with tensioning straps on both sides.

- Before installing rear axle, grease kidney-shaped cavities in bonded rubber bushes with assembly paste G 052 150 A2.

  Noise can occur when the vehicle is driven if the bushes are installed dry.



-> Only tighten the bolts securing the rear axle to the mounting bracket when the distance -a- between the centre of the wheel hub and the lower edge of the wheel housing is the same as the distance measured before starting work.

Otherwise the bonded rubber bush will be under load, and service life will be reduced.

- Turn wheel hub until one of the threaded holes for the wheel bolts is facing upwards.
- Attach support T10149 using wheel bolt.
- Lift wheel bearing housing using engine/gearbox jack until distance -a- is obtained.

Caution
- **Do not lift or lower the vehicle when engine/gearbox jack is underneath.**
- **Do not leave engine/gearbox jack under the vehicle for longer than necessary.**

- Tighten bolts securing rear axle to mounting bracket to specified torque.

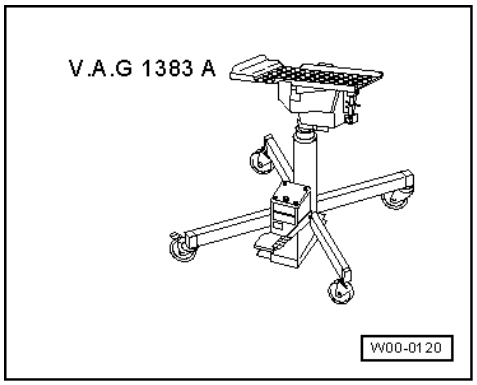
Perform remaining installation steps in reverse sequence of removal.

- Bleed brake system

=> Brake system; Repair group 47; Bleeding brake system Bleeding brake system

Tightening torque:	
Mounting bracket to rear axle	80 Nm
Use new bolts and nuts	

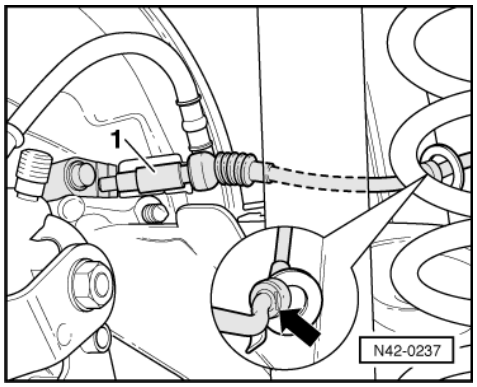
1.7 - Removing and installing shock absorber/spring



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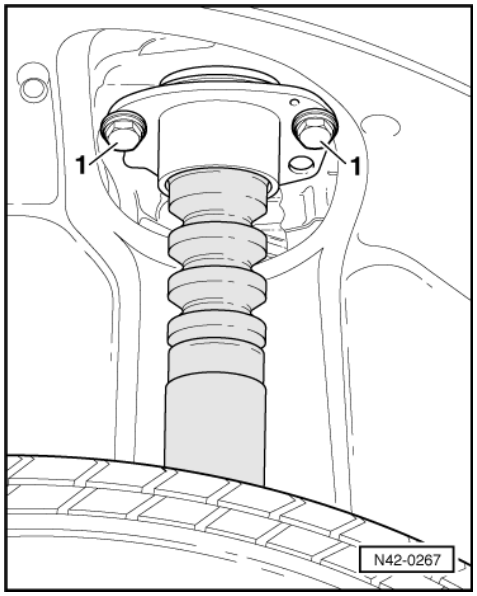
Special tools and workshop equipment required

- Engine/gearbox lifter V.A.G 1383 A



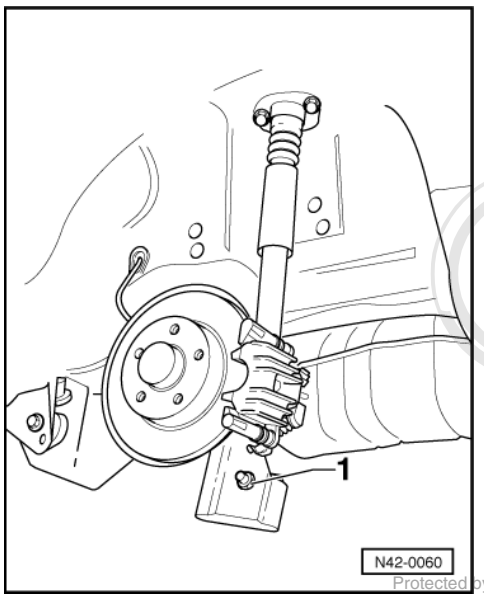
Removing spring

- Raise vehicle.
- -> Unplug connector -1- of ABS speed sensor.
- Unclip speed sensor wire from holder -arrow-.



- -> Lower vehicle until wheels are standing on ground and bolts -1- are also accessible.
- Screw out bolts -1-.
- Raise vehicle to installation height, thus relieving the load on the coil spring.
- Take out spring.

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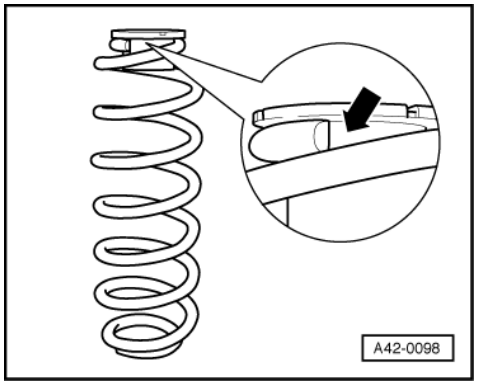
Removing shock absorber

- -> Screw out bolt -1- for shock absorber.

Note:

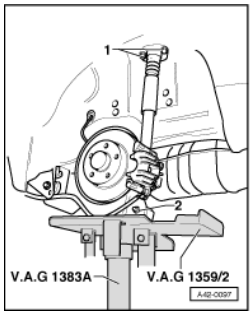
Wheel has been removed in Fig.

- Take out shock absorber.



Installing

- Check zinc seat for damage and replace if necessary.
- Install spring together with spring support.
  - -> Start of spring -arrow- must make contact with stop of spring support



- -> Use engine/gearbox lifter V.A.G 1383 A and universal mount V.A.G 1359/2 to press rear axle upwards.
- Hand-tighten lower bolted joint -2- for shock absorber.
- Screw on shock absorber at top -1-.
- Set vehicle down on its wheels.
- Tighten bolts to stipulated torques.

Tightening torques

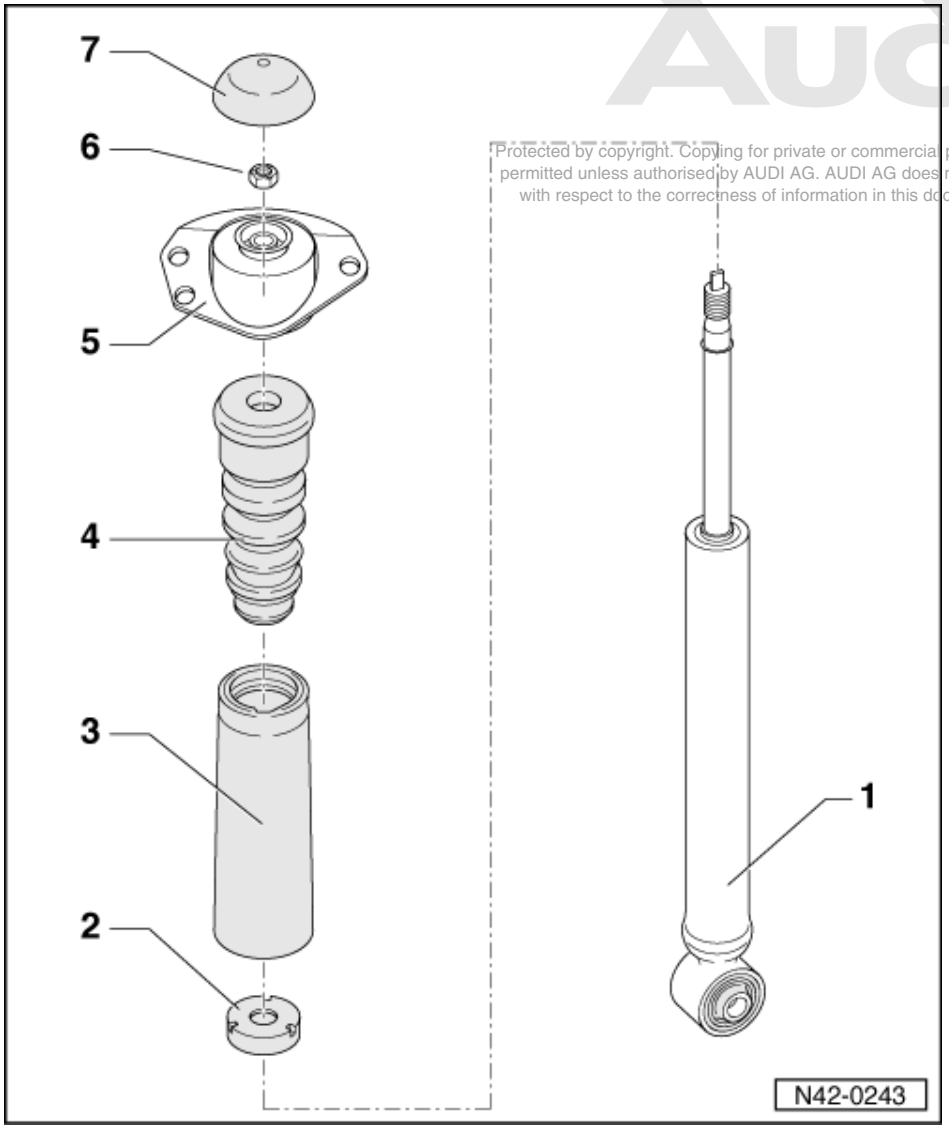
Component	Nm
Shock absorber to body	30 + 90° 1)2)
Shock absorber to rear axle	40 + 90° 1)2)

1) 90°corresponds to quarter turn

2) Replace bolts and nuts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

1.8 - Dismantling and assembling shock absorber



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1 Shock absorber

- Can be replaced separately

- Assignment to vehicle => Vehicle data sticker, Page 1
- Checking shock absorber for leaks => Page 7
- Checking shock absorber following removal => Page 8

2 Protective cap

3 Inside tube

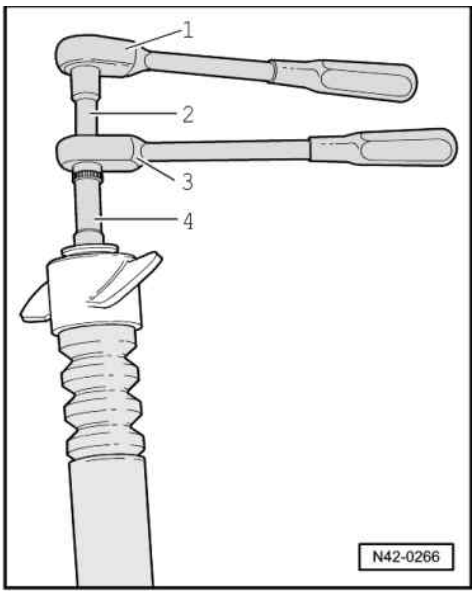
4 Buffer stop

5 Shock absorber mount

6 Nut, 25 Nm

- Self-locking
- Always replace after removing
- Unscrewing =>Fig. 1

7 Cap



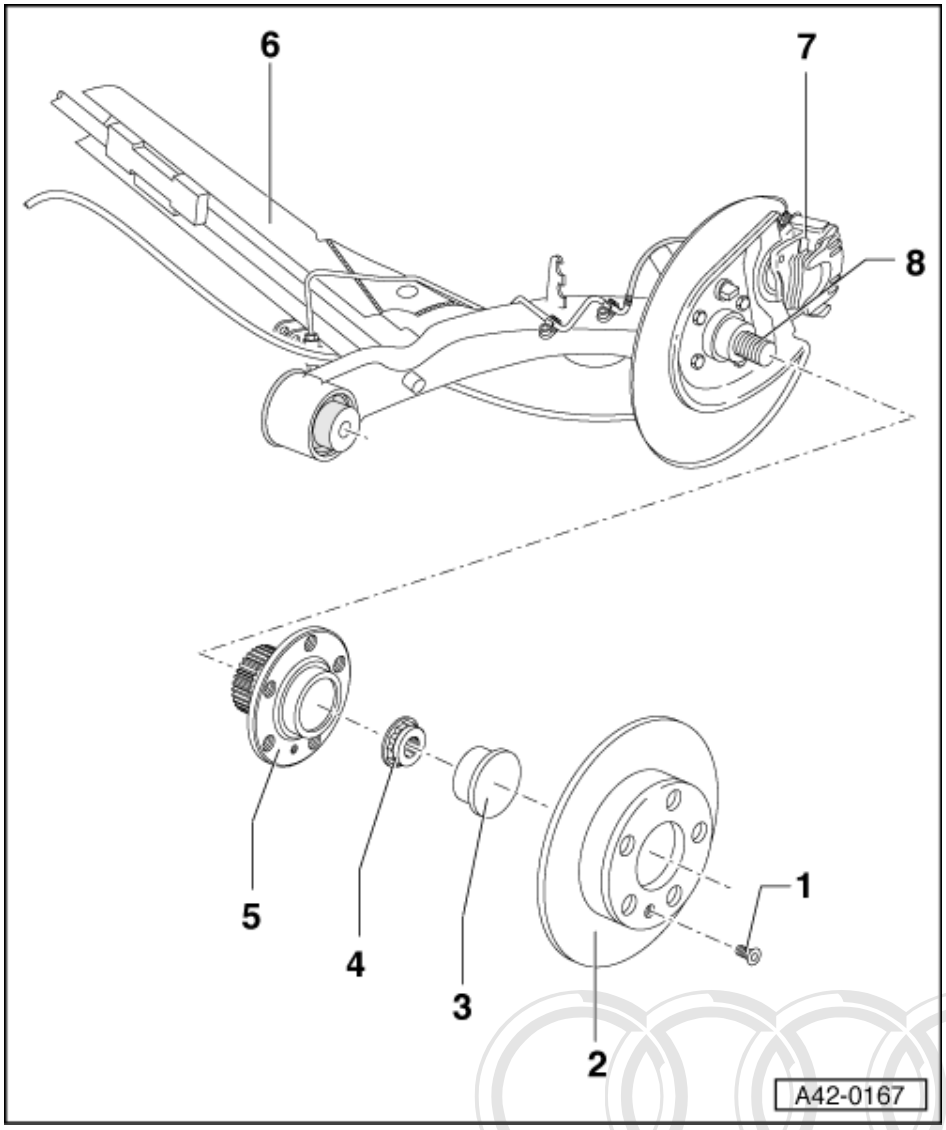
-> Fig.1 Unscrewing hexagon nut from shock absorber

1 - Ratchet handle (commercially available)
2 - Insertion tool T10001/9
3 - T 10001/11
4 - Insertion tool T10001/1

Special tool 3079 can also be used.

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1.9 - Exploded view of rear wheel bearing components



1 Cross-head bolt

- Tightening torque:

=> Brake System; Repair Group 46

2 Brake disc

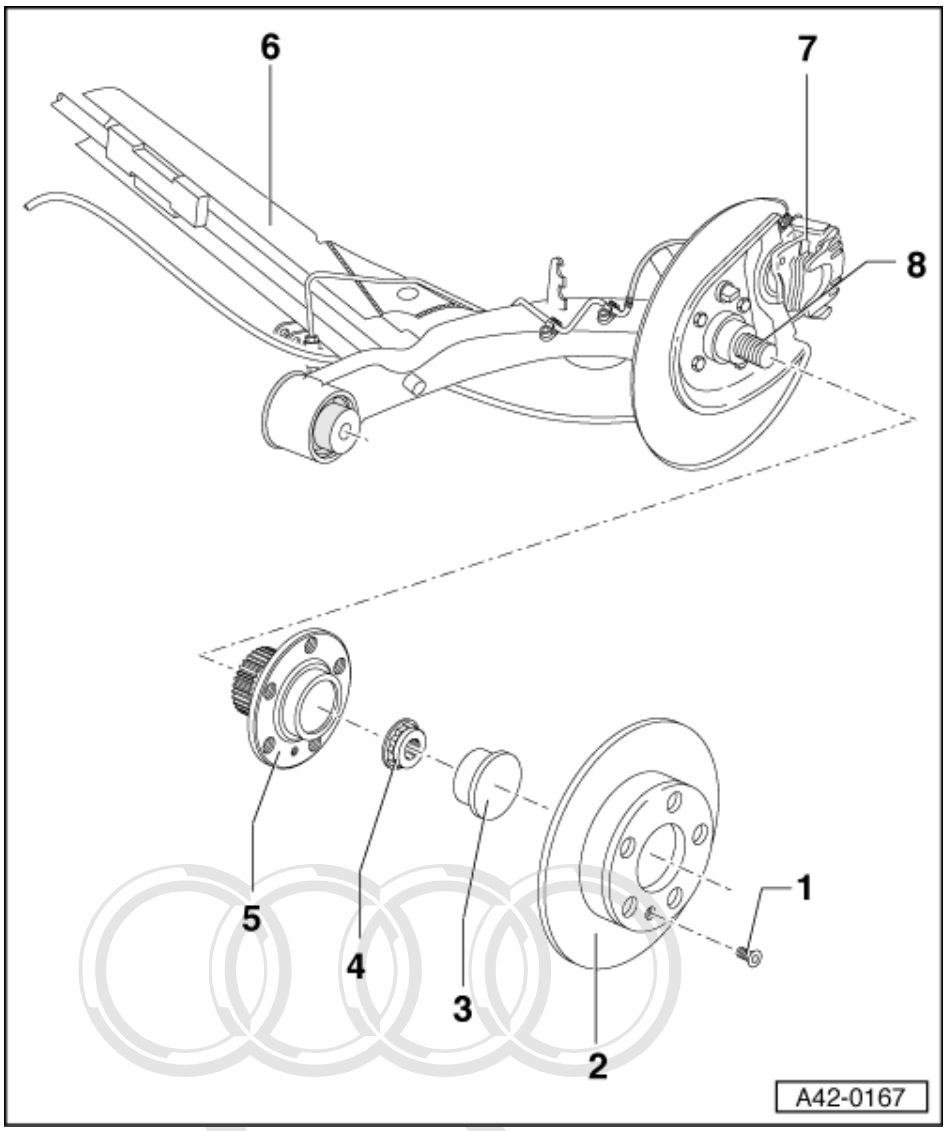
3 Grease cap

- Pressing off => Page 192
- Always replace after removing
- Driving in => Page 194

4 Twelve-point nut - 70 Nm + further 45° (1/8) turn

- Self-locking
- Always replace after removing

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5 Wheel hub with wheel bearing

- Wheel bearing and wheel hub are fitted in a joint housing
- Wheel bearing/wheel hub unit is maintenance-free and there is no play; neither adjustment nor servicing work can be performed
- Pressing out and pressing in => Page 191

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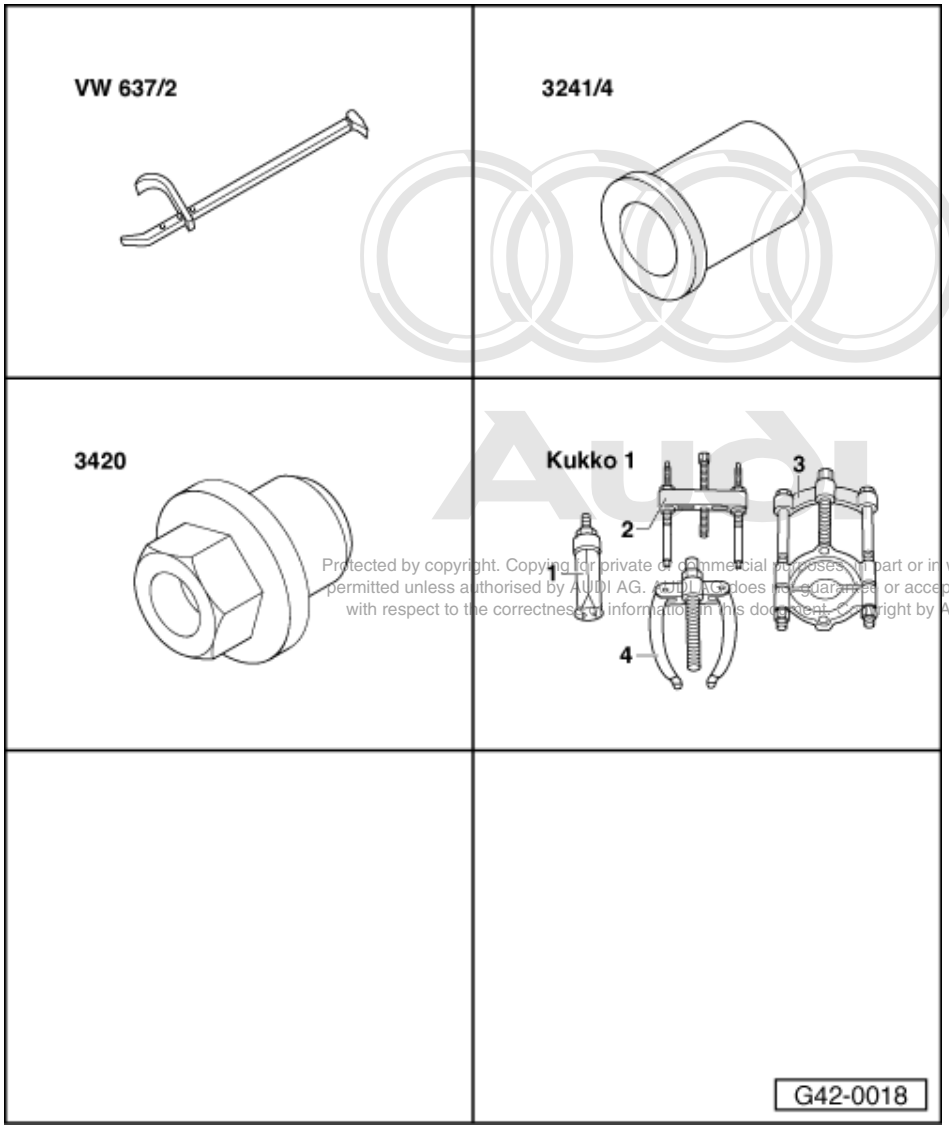
6 Rear axle

7 Brake caliper

8 Stub axle

- Straightening work is not permitted
- Thread is not to be re-cut

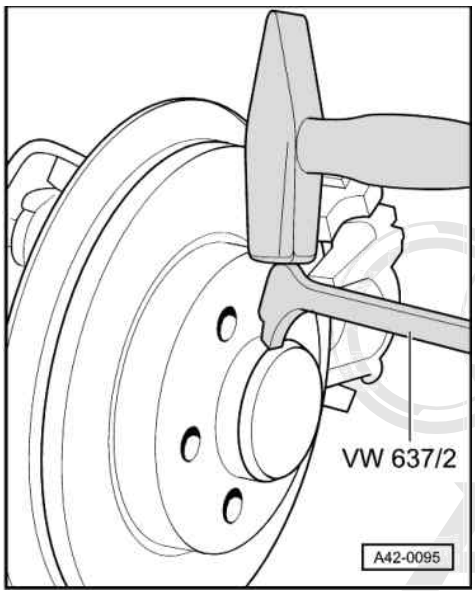
1.10 - Removing and installing wheel bearing/wheel hub unit



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Special tools and workshop equipment required

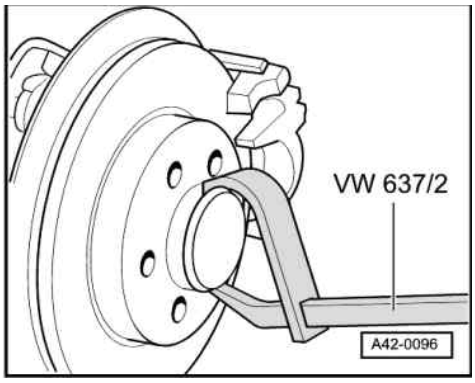
- Hub cover puller VW 637/2
- Fitting sleeve 3241/4
- Assembly tool 3420
- 1 - Puller Kukko 20-2
- 3 - Puller Kukko 204-1



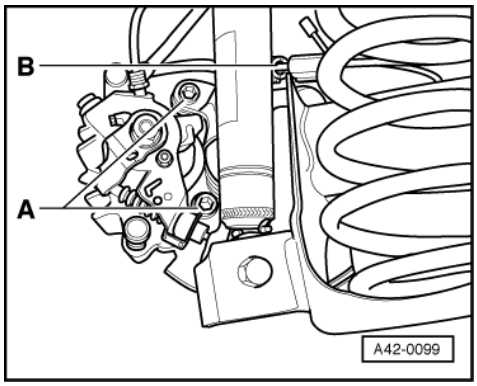
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Removing

- Remove wheel.
- -> Detach grease cap from its seat by tapping gently on claw.



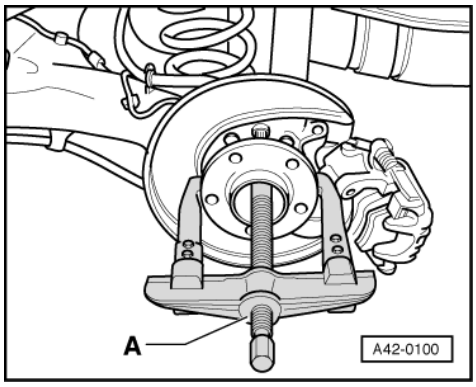
- -> Press off grease cap.



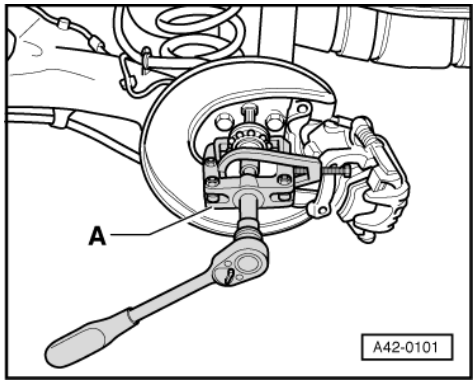
- -> Screw out bolts -A-.
- Detach brake caliper and hang up with piece of wire.

Note:

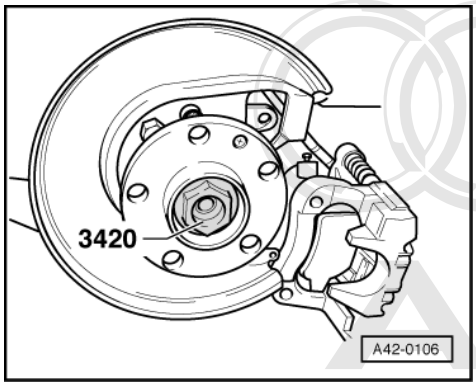
Brake hose/pipe is never to be twisted or kinked.



- Screw out cross-head bolt for brake disc and detach brake disc.
- Unscrew twelve-point nut.
- -> Use puller Kukko 20-2 -Item A- to detach wheel bearing/wheel hub unit.



- -> Use puller Kukko 204/1 -Item A- to detach bearing inner race from stub axle.

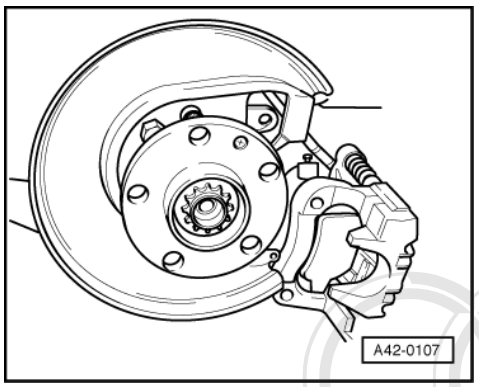


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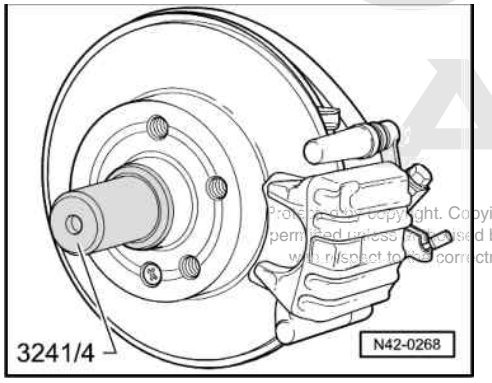
Installing

Install in reverse order, paying attention to the following:

- -> Slide wheel bearing/wheel hub unit as far as possible onto stub axle.
- Screw on assembly tool 3420 and pull on wheel hub/wheel bearing unit as far as stop.
- Unscrew assembly tool 3420.



- -> Fit new twelve-point nut and tighten.



- -> Use fitting sleeve 3241/4 to drive on grease cap.

Note:

Moisture can enter through damaged (dented) grease caps. For this reason, always use the special tool shown.

- Fit brake disc and brake caliper.

=> Brake System; Repair Group 46

Tightening torque

Component	Nm
Twelve-point nut to stub axle	70 + 45° 1)

1) 45°corresponds to one eighth of a turn

2) Replace nut

2 - Servicing rear axle - Four-wheel drive vehicles

2.1 - Servicing rear axle - Four-wheel drive vehicles

General:

Loadbearing and suspension elements are not to be welded and straightened.

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Never move vehicles without drive shaft fitted, as otherwise wheel bearing damage will result. Should it nevertheless become necessary to move the vehicle, always heed the following:

- Fit an outer joint instead of the drive shaft.
- Tighten the outer joint to 50 Nm.

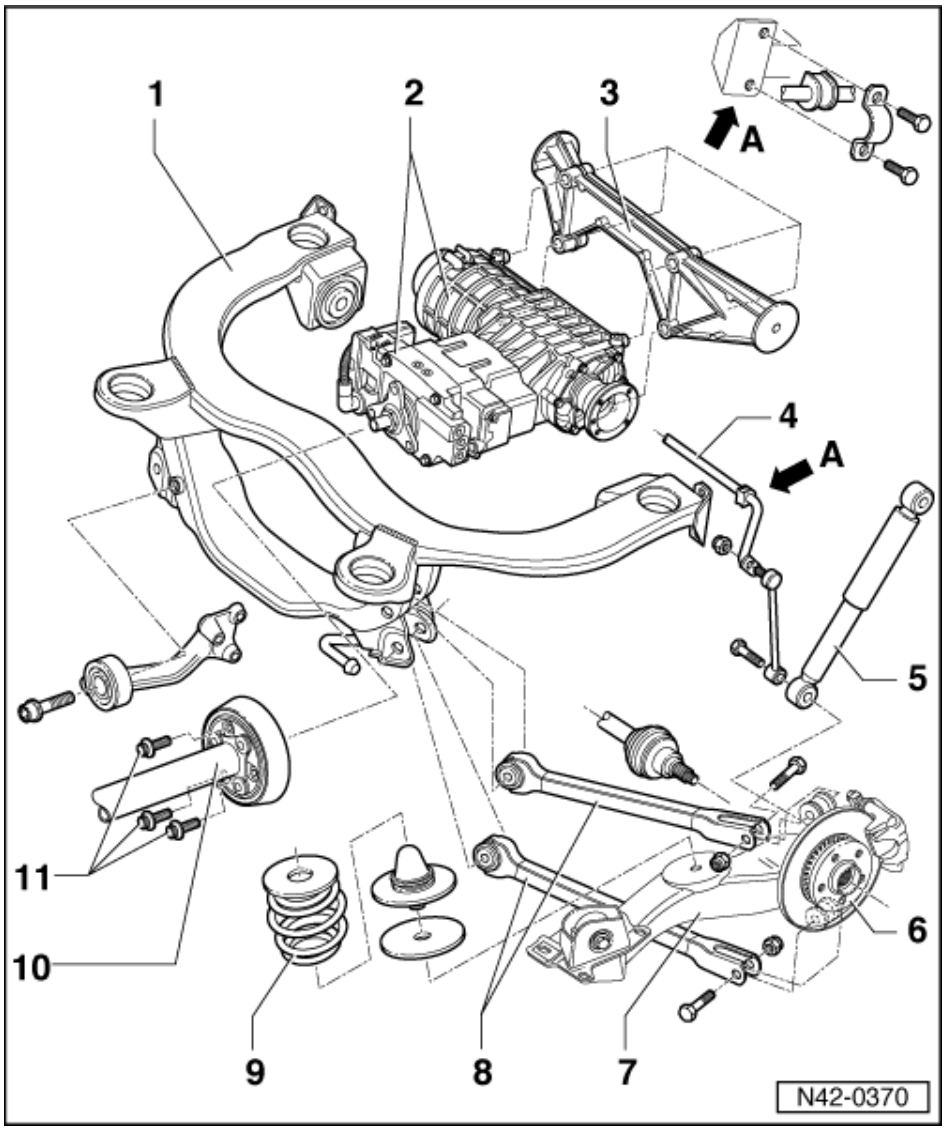
Bonded rubber bushes can only be turned to a limited extent. The bolted joints at the suspension links are therefore not to be tightened until the vehicle is standing on the ground.

If wheel alignment is subsequently to be performed on vehicle, bolts and nuts to be unfastened for adjustment work are only to be tightened to torque. These bolts and nuts are then to be finish-tightened by the prescribed extra turn on completion of wheel alignment/adjustment.

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Attention:
All bolts and nuts must be properly tightened on vehicles being used on public roads.

2.2 - Exploded view of rear axle components



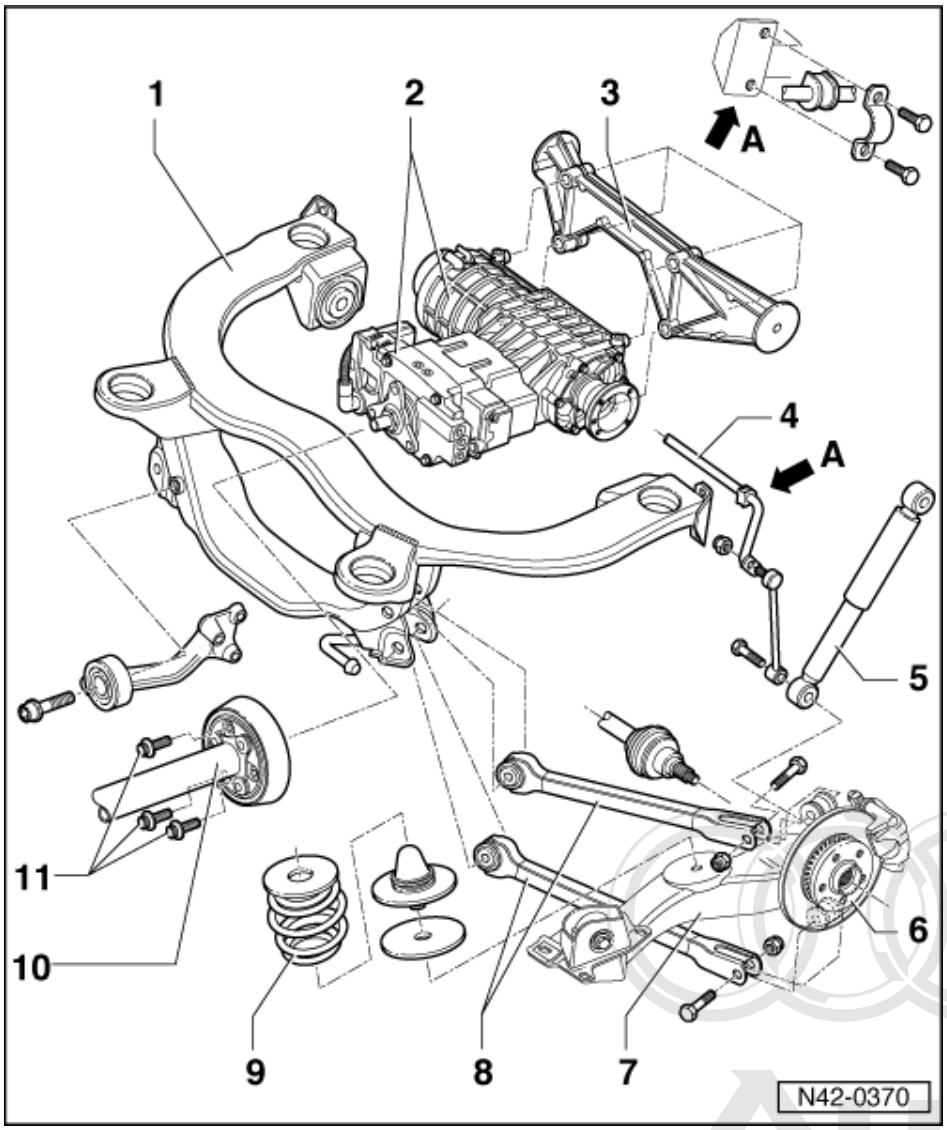
Note:

Wheel bolt tightening method and torque
=> Page 273

1 Subframe
2 Final drive
3 Cross member
4 Anti-roll bar
- Removing and installing=>Page 198

5 Shock absorber
- Exploded view => Page 200

6 Wheel hub with wheel bearing
- Pressing out and pressing in =>Page 231



7 Trailing arm
- Exploded view => Page 211

8 Transverse link
- Exploded view => Page 211

9 Coil spring
- Exploded view => Page 200

10 Propshaft

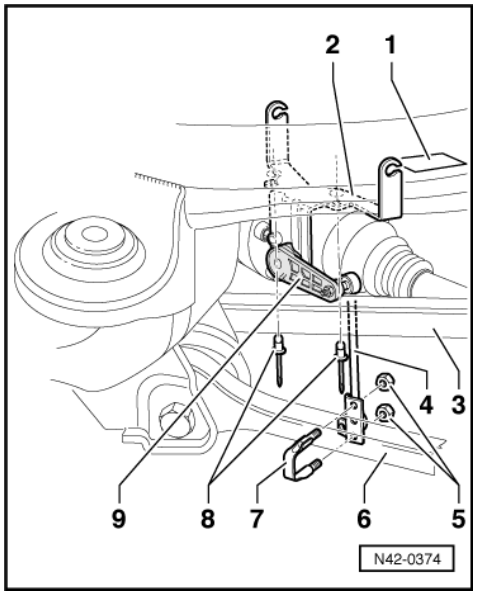
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11 Twelve-point bolt

- Tightening torque:

=> 5-speed Manual Gearbox 02C Four-wheel Drive/Final Drives; Repair Group 39
=> 5/6-speed Manual Gearbox 02M Four-wheel Drive/Final Drives; Repair Group 39

2.3 - Rear left vehicle level sender -G76 for headlight range control

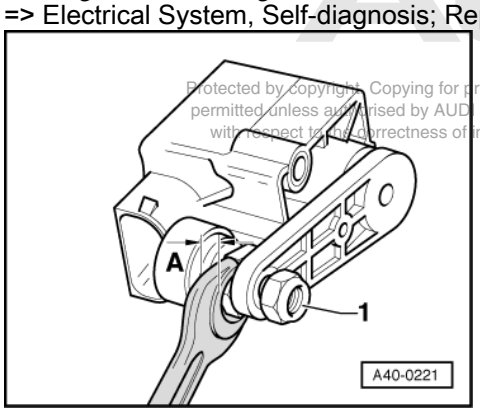


1 - -> Subframe
2 - Bracket
3 - Upper transverse link
4 - Connecting link
5 - Nut, self-locking, 5 Nm
Always replace after removing
6 - Lower transverse link
7 - Clip
8 - Rivet/self-tapping screw, 9 Nm
9 - Rear left vehicle level sender -G76
Do not detach connecting link from ball end

Note:
Headlight basic setting is always to be performed:

- On removing and installing wishbone
- Following vehicle level sender installation work

Headlight basic setting
=> Electrical System, Self-diagnosis; Repair Group 01

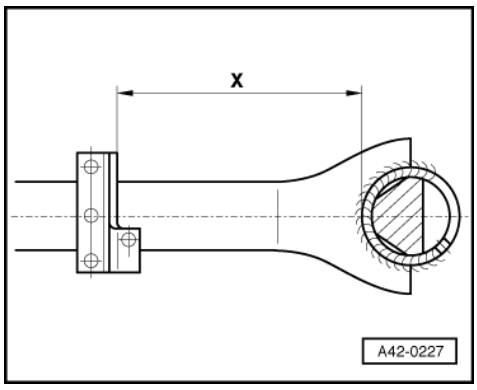


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Note:

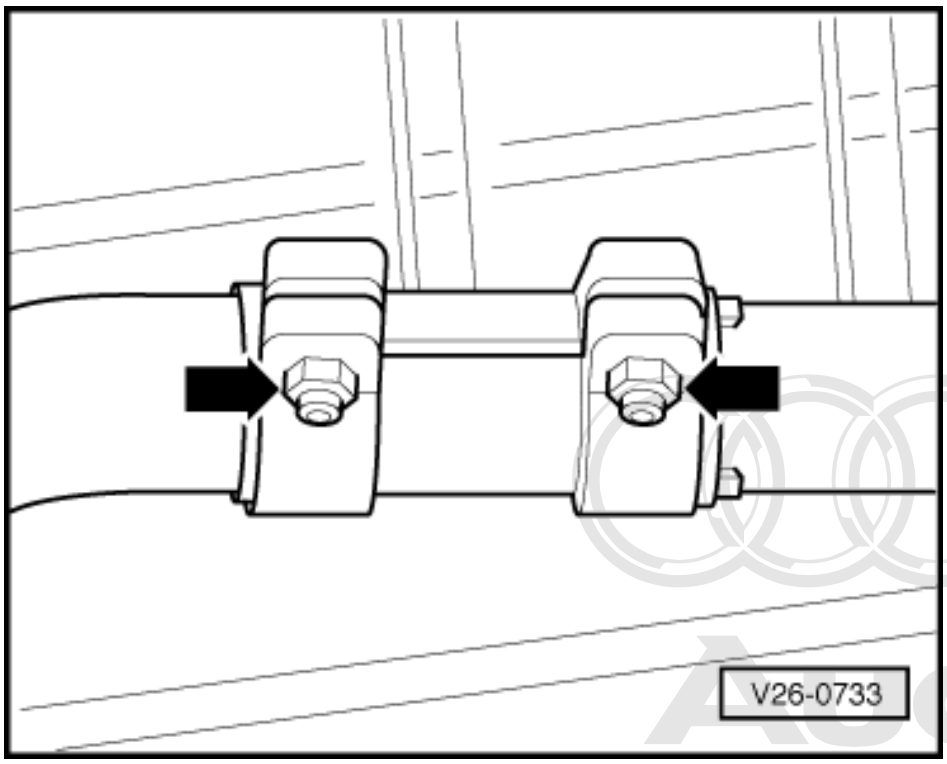
-> For attaching linkage -Item -1- to sensor,use 9 mm open-ended wrench with dimension A = 4 mm so as not to damage seal.

- Tightening torque: 3.5 Nm



- -> Attach retaining plate for connecting link at a distance X = 153 mm from inner bonded rubber bush of lower transverse link.

2.4 - Removing and installing anti-roll bar



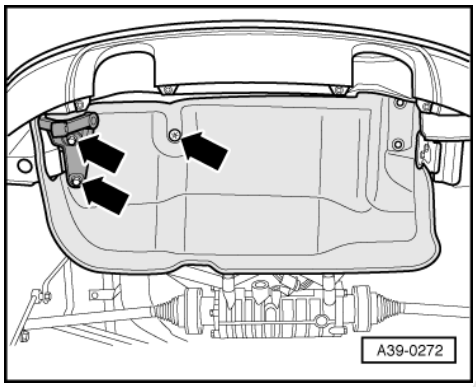
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Removing

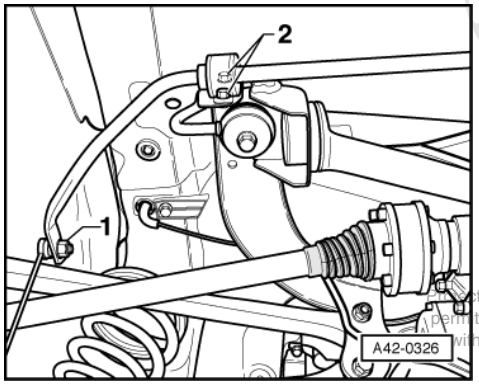
- -> Separate exhaust system at clamp -arrows-.
- Unscrew rear right exhaust system bracket.
- Disengage exhaust system from brackets.

Note:

To avoid damage, decoupling element of exhaust system is never to be kinked by more than 10 °.



- -> Unscrew rear heat shield and exhaust system bracket -arrows-.



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- -> Unscrew nut -1- at connecting link.
- Detach connecting link at anti-roll bar.
- Screw out bolts -2- at anti-roll bar clamps.
- Detach clamps with anti-roll bar.

Installing

Install in reverse order, paying attention to the following:

- Pre-tighten bolts -2- for clamps to 5 Nm.
- Finish-tighten bolts for clamps to stipulated torque.
- Install exhaust system and perform stress-free alignment.

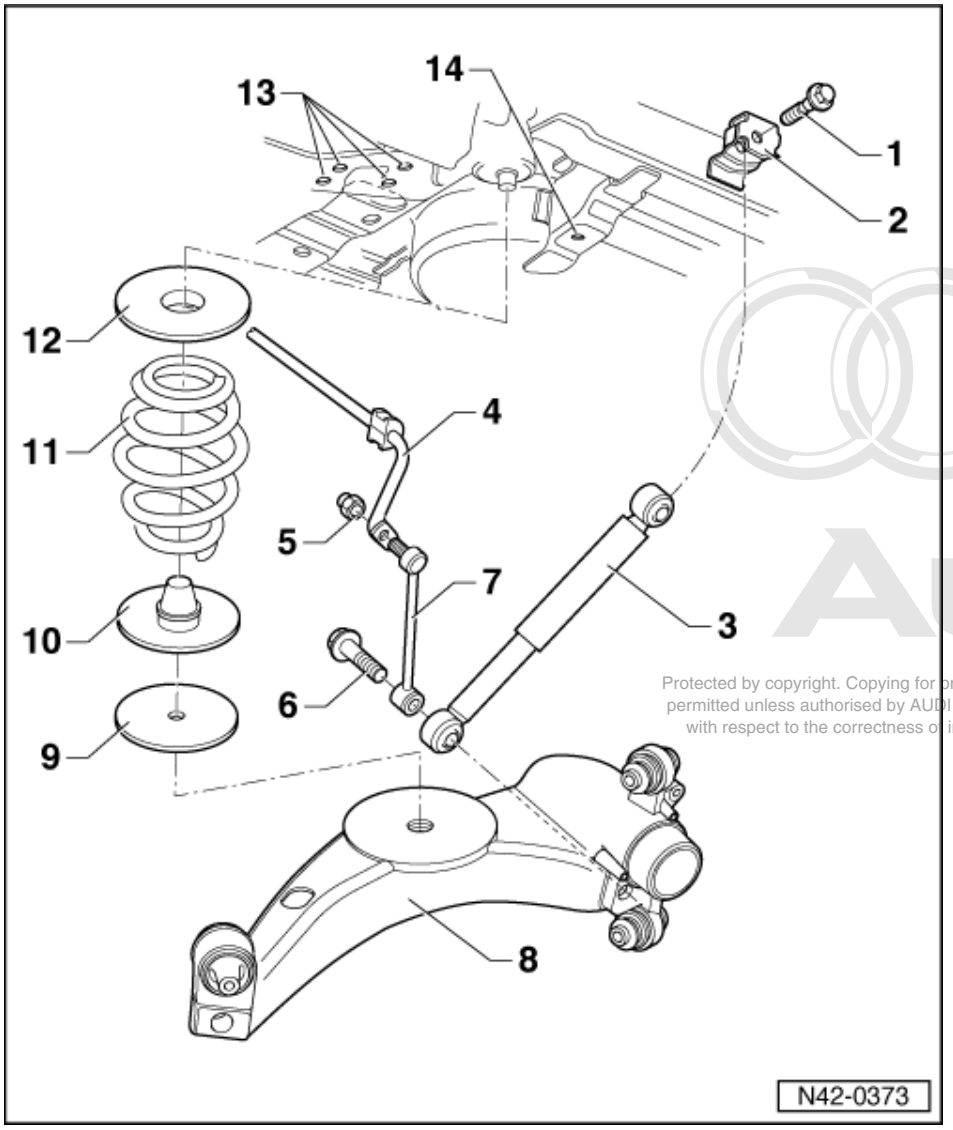
=> Engine, Mechanics; Repair Group 26

Tightening torques

Component	Nm
Anti-roll bar clamp to subframe	20
Bracket for silencer to body	25
Connecting link to anti-roll bar	25 1)

1) Replace nuts

2.5 - Exploded view of spring and shock absorber

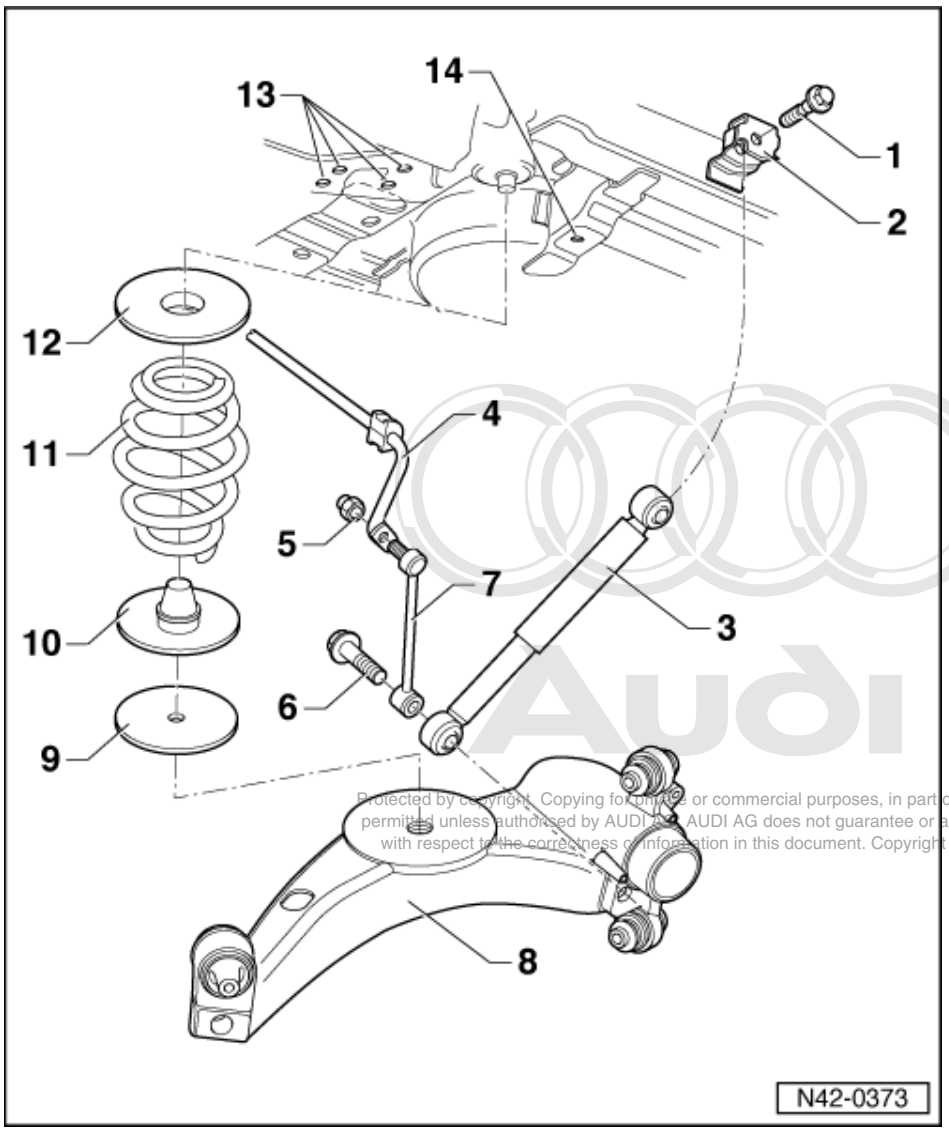


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1 **Bolt, 60 Nm**
- Always replace after removing

2 **Mounting bracket for shock absorber**

3 **Shock absorber**
- Only to be replaced in pairs up to vehicle ident no. 8L_YA_117 500
- Assignment to vehicle => Vehicle data sticker, Page 1
- Checking shock absorber for leaks => Page 7
- Checking shock absorber following removal => Page 8
- Before scrapping defective shock absorbers, always ensure gas release and draining => Page 5



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4 Anti-roll bar
- Removing and installing=>Page 198

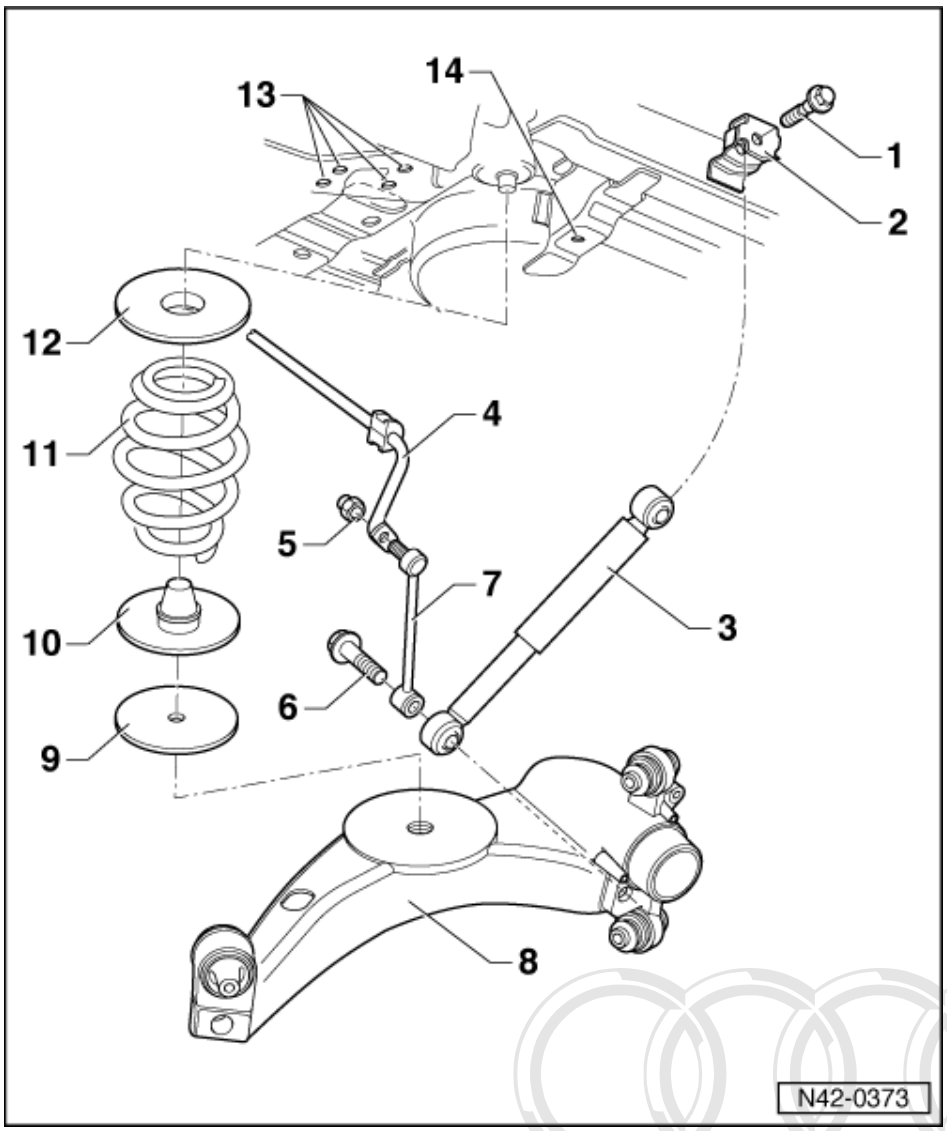
5 Nut, 25 Nm
- Self-locking
- Always replace after removing

6 Bolt, 110 Nm
- Always replace after removing

7 Connecting link

8 Trailing arm
- Different versions => Fig. 1

9 Spacer
- For vehicles with heavy-duty running gear only; distinguishing feature => vehicle data sticker, Page 1



10 Buffer stop

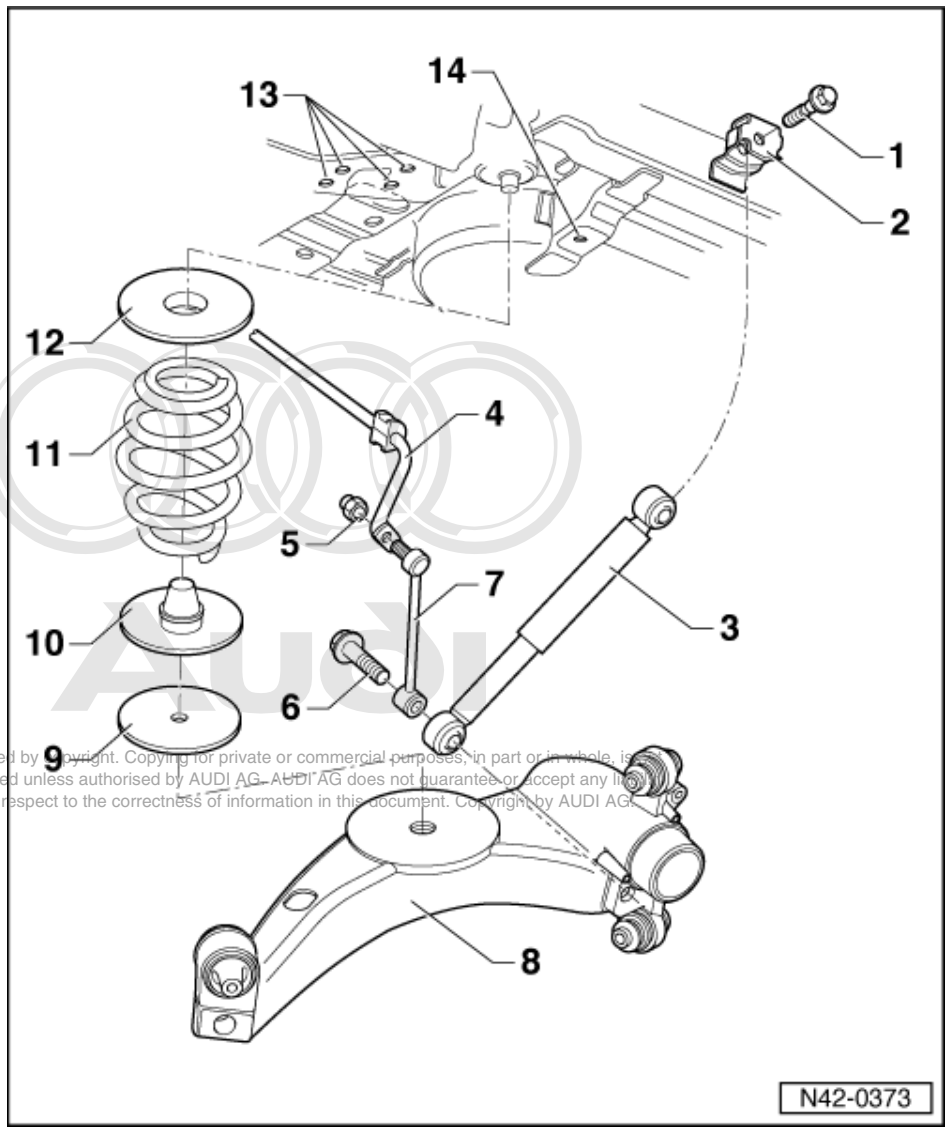
- Different versions => Fig. 1
- Tighten version with threaded pin to 10 Nm

11 Coil spring

- Assignment to vehicle => Vehicle data sticker, Page 1
- Check for paint damage and eliminate any damage
- Heed colour coding
- Installation position: Coloured mark on spring points downwards towards buffer stop
- Removing and installing=>Page 204

12 Spring seat

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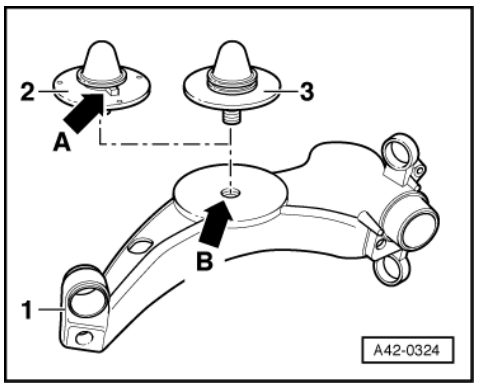
13 Thread in longitudinal member

- Thread in body can be repaired using threaded wire insert as per DIN 8140 (Heli-Coil)
  Threaded insert must be of same length as thread in body

Attention:
Repair work using Heli Coil may only be performed at two nuts per side.

14 Thread in cross member

- Thread in body can be repaired using threaded wire insert as per DIN 8140 (Heli-Coil)
  Threaded insert must be of same length as thread in body



-> Fig.1 Different trailing arms and buffer stops

A modified trailing arm -1- and a modified buffer stop -2- have been fitted as of approx. 06.99.

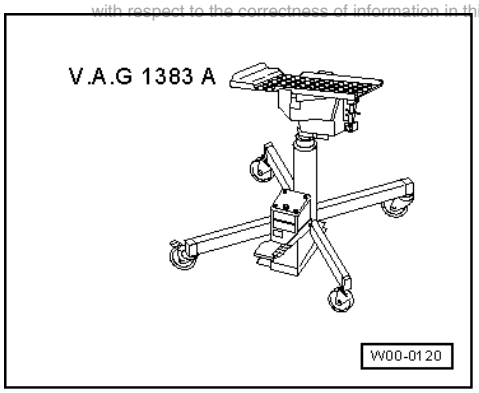
- Installation of a new buffer stop -2- with locating pin in a trailing arm prior to 06.99 involves enlarging thread -arrow B- in trailing arm to ø 10.5 mm. Locating pin on underside also has to be cut off.
- Heed the following on installation: Start of spring winding must make contact with web -arrow A-.

Note:

Buffer stop -3- with threaded pin (version up to approx. 06.99) is tightened to 10 Nm.

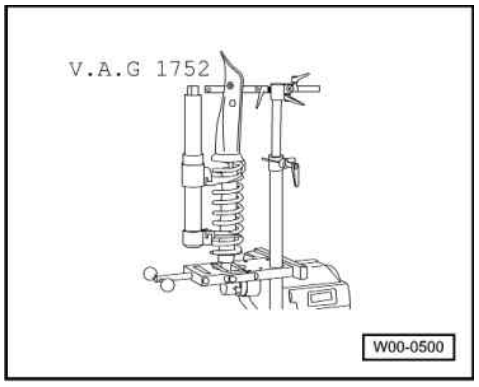
2.6 - Removing and installing spring

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Special tools and workshop equipment required

- Engine/gearbox lifter V.A.G 1383 A

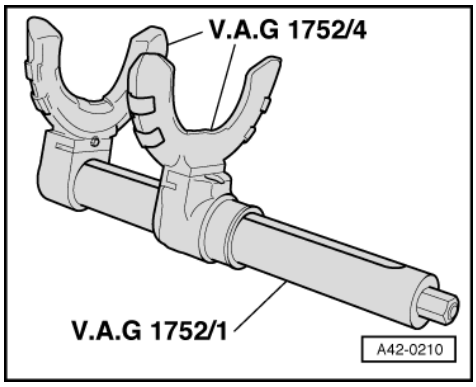


- Suspension strut tensioner V.A.G 1752

Safety precautions

Extremely high forces occur when tensioning springs. Particular attention is therefore to be paid to the following safety precautions.

Attention:
- **Make sure spring holders are as close as possible to spring windings.**
- **Whilst tensioning, check correct positioning of spring holders at spring windings.**
- **Never use impact screwdriver.**

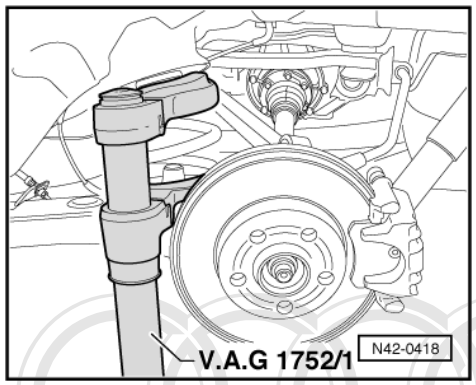


Removing

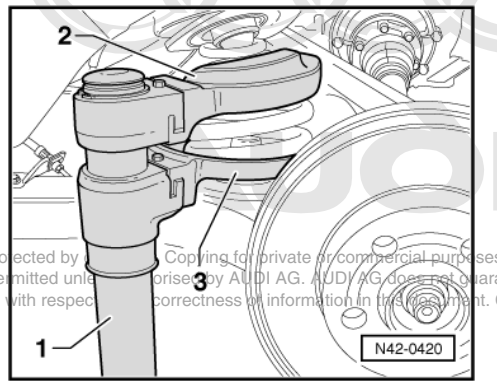
Note:

The following description relates to the left spring. The right spring is removed in the same manner.

- Remove rear wheel.
- -> Fit spring holders V.A.G 1752/4 at spring tensioner V.A.G 1752/1.



- -> Insert spring tensioner V.A.G 1752/1 with spring holder V.A.G 1752/4 in coil spring.

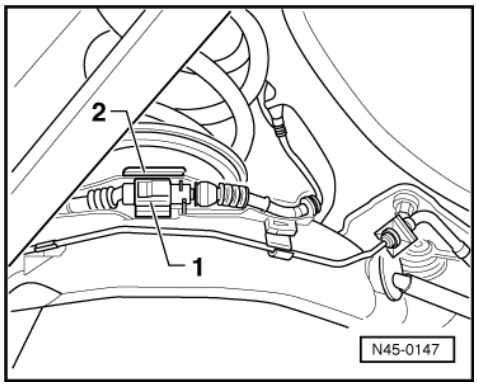


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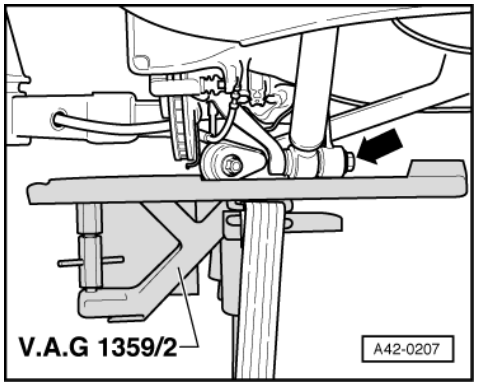
- -> Turn spindle of spring tensioner until spring is slightly tensioned.

  Check whether spring holders are properly positioned at spring windings.

- Halt tensioning process at the latest when spring windings make contact.



- -> Unclip speed sensor wire from holder.
- Open cover -2- for connector -1-.
- Pull speed sensor out of trailing arm.
- Disengage headlight range control unit => Page 197 .

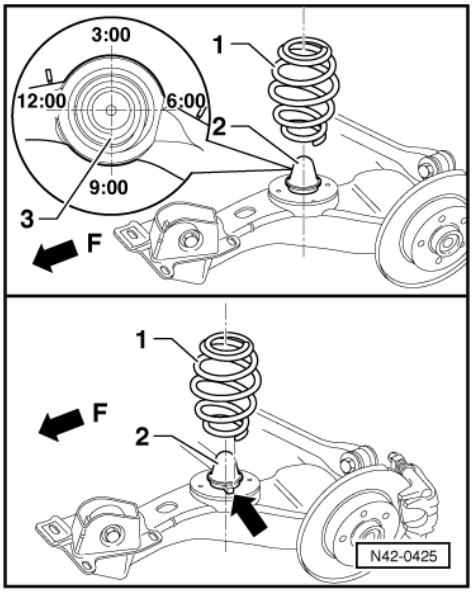


- Use engine/gearbox lifter V.A.G 1383 A and universal mount V.A.G 1359/2 to raise wheel bearing housing slightly.

Attention:
Do not raise vehicle further than necessary to prevent it falling off lifting platform.

- -> Screw out bolt -arrow-.
- Slowly lower engine/gearbox lifter again.
- Take out spring with spring tensioner.

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Installing

- Insert spring in spring holders.
- Turn spindle of spring tensioner until spring is slightly tensioned.

  Check whether spring holders are properly positioned at spring windings.

- Halt tensioning process at the latest when spring windings make contact.

-> Installation position of spring

For vehicles with no stop at buffer stop -2-

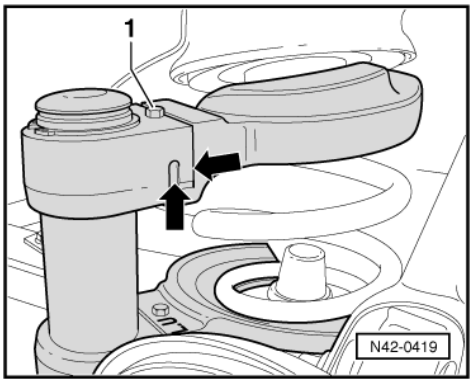
- Start of spring winding -3- must be in 9o'clock position

  1 - Spring
  F - Direction of travel

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For vehicles with stop at buffer stop -2-

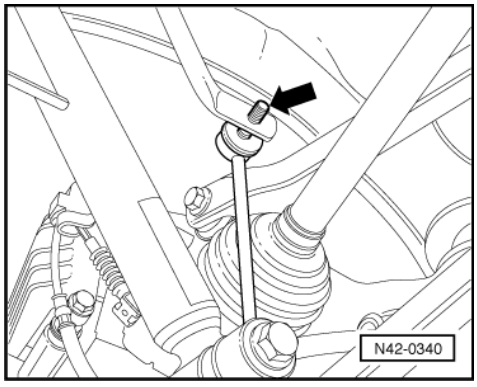
- Start of spring winding must make contact with stop -arrow-



- Slacken off spring by turning spindle anti-clockwise.
- -> Whilst slackening off, check correct installation position of spring.

  Never use impact screwdriver or the like.

Spring holders will become jammed in spring if spindle is turned too far.
- Take spring tensioner out of spring.



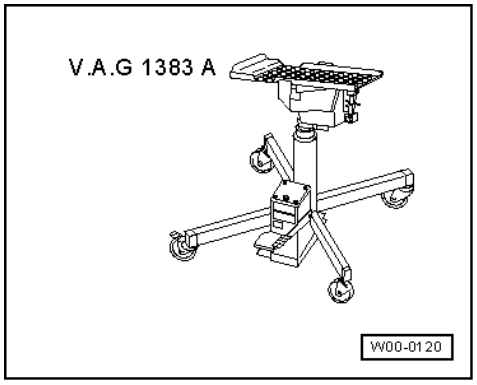
Perform further installation in reverse order, paying attention to the following:
Note:
-> If necessary, unscrew connecting link -arrow- from anti-roll bar. Lower damper bolt is then easier to fit.
Tightening torques

Component	Nm
Shock absorber to trailing arm	110 1)
Connecting link to anti-roll bar	25 1)

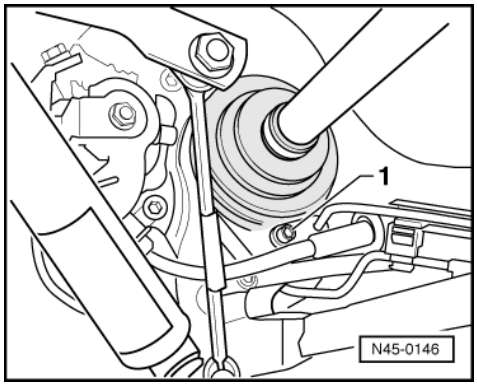
1) Replace bolts and nuts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

2.7 - Removing and installing shock absorber



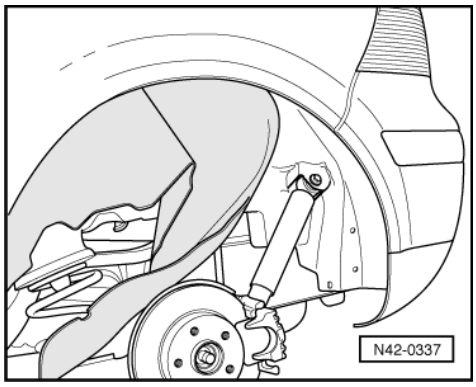
Special tools and workshop equipment required
- Engine/gearbox lifter V.A.G 1383 A



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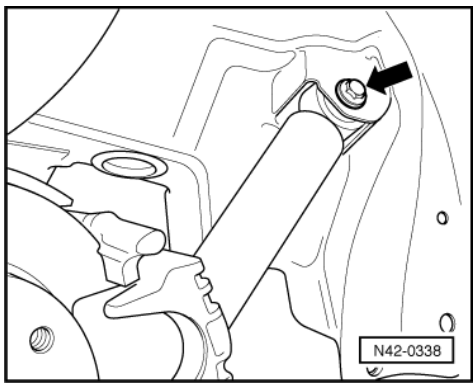
Removing

- Remove rear wheel.
- -> Screw out bolt -1-.
- Pull speed sensor out of trailing arm.



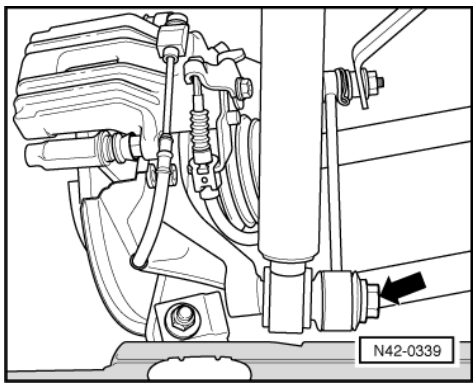
- -> Partially unfasten wheel housing trim.
- Use engine/gearbox lifter V.A.G 1383 A and universal mount V.A.G 1359/2 to raise trailing arm slightly.

Attention:
Do not raise vehicle further than necessary to prevent it falling off lifting platform.

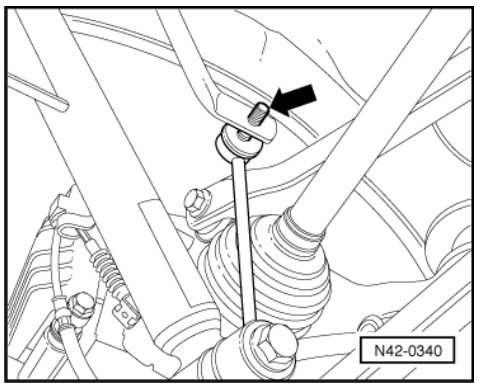


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- -> Screw out upper shock absorber bolt -arrow-.



- -> Screw out lower shock absorber bolt -arrow-.
- Take out shock absorber.



Installing

Install in reverse order, paying attention to the following:

- Check that there is sufficient clearance between brake shield and brake disc.

Note:

-> If necessary, unscrew connecting link -arrow- from anti-roll bar. Lower damper bolt is then easier to fit.

Tightening torques

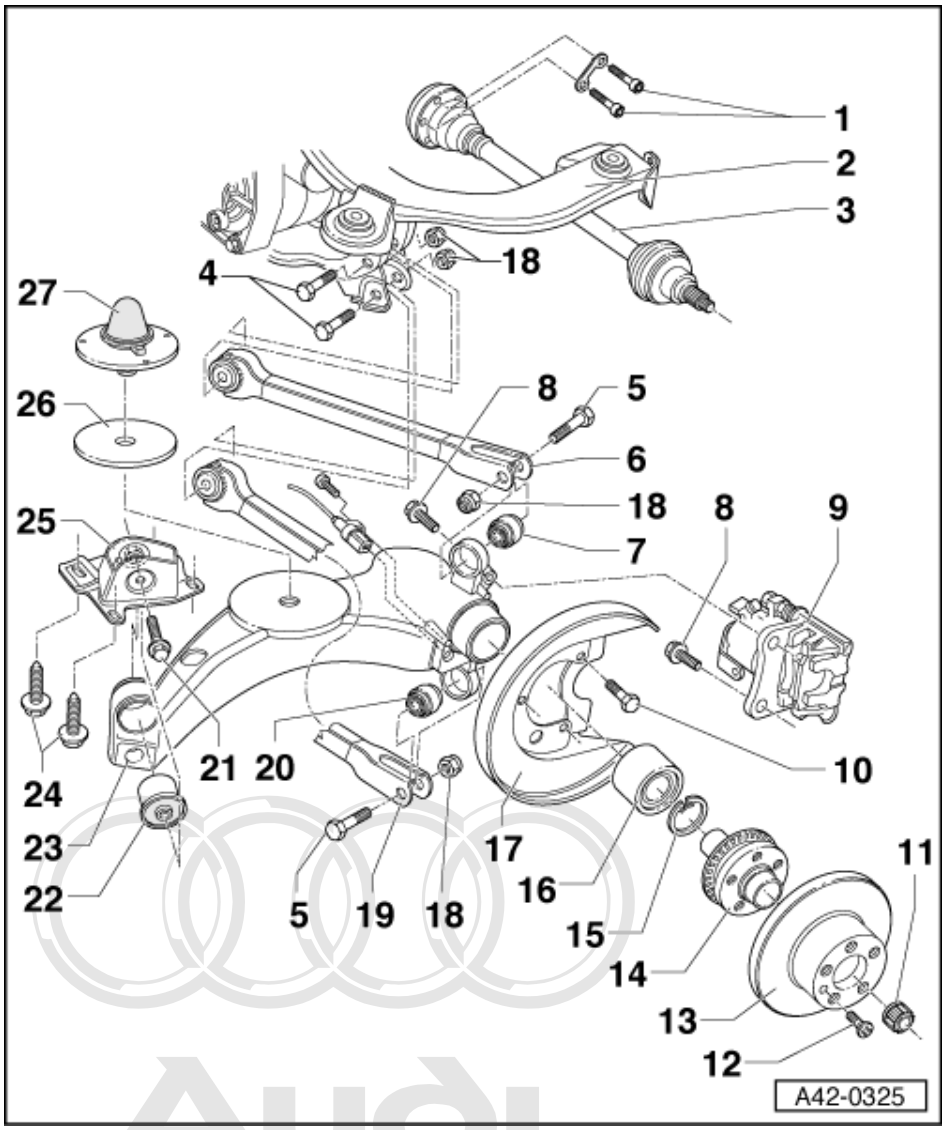
Component	Nm
Shock absorber to body	60 1)
Shock absorber to trailing arm	110 1)
Connecting link to anti-roll bar	25 1)

1) Replace bolts and nuts

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Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

2.8 - Exploded view of trailing arm and transverse link



1 **Multi-point socket head bolt, 40 Nm**

2 **Subframe**

- Removing and installing
  => Page 240

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3 **Drive shaft**

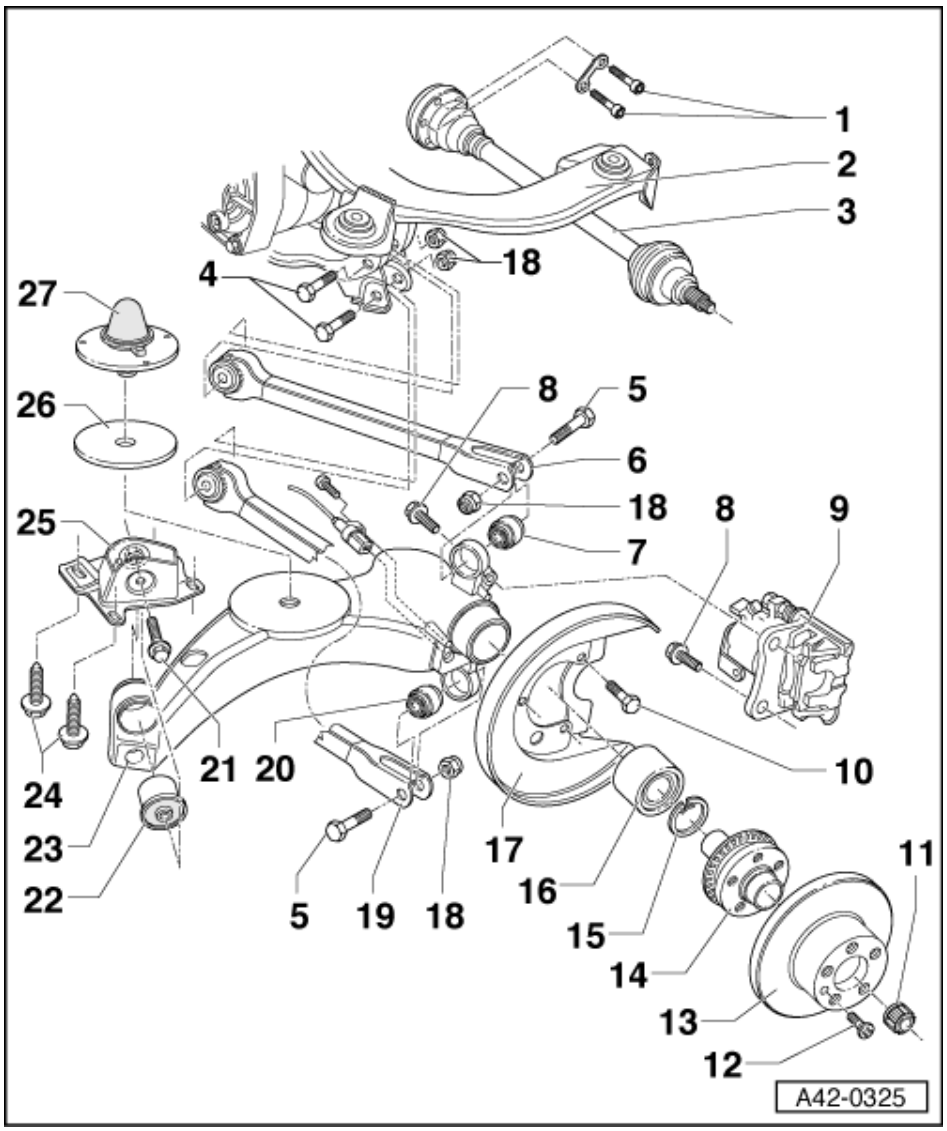
- Pressing out of and into wheel hub
  =>Removing and installing drive shafts, Page 110

4 **Hexagon bolt**

- M12 x 1.5 x 80
- Always replace after removing

5 **Hexagon bolt**

- M12 x 1.5 x 75
- Always replace after removing



6 Upper transverse link

- Different versions are available; for correct assignment refer to

=> Parts List

- Same versionmust always be installed on left and right sides =>Page 216
- Removing and installing=>Page 228

7 Ball joint

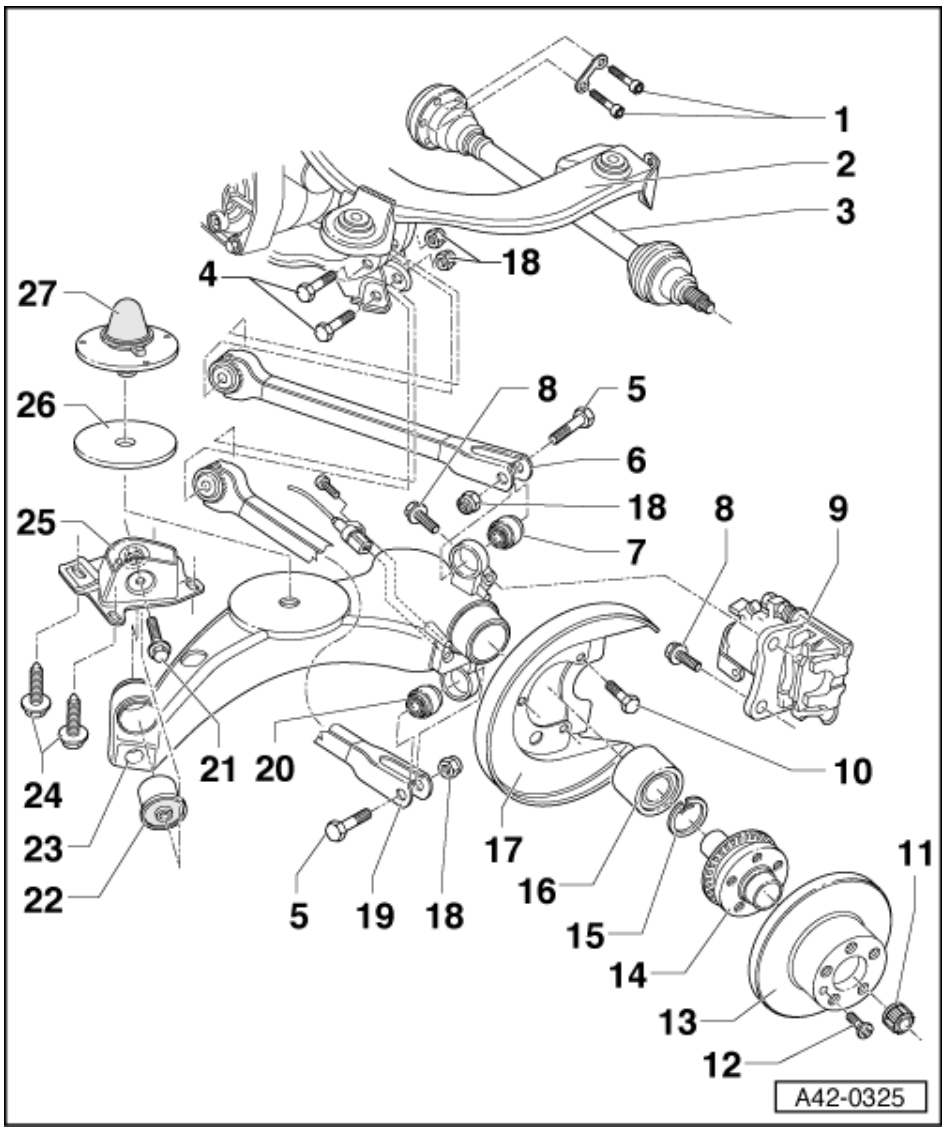
- Check rubber bellows for damage and cracks
- New version: bonded rubber bush =>Page 216
- Removing and installing=>Page 221

8 Hexagon socket-head bolt

- Tightening torque:

=> Brake System; Repair Group 46

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9 Brake caliper

10 Bolt

- Tightening torque:

=> Brake System; Repair Group 46

11 Twelve-point nut

- Self-locking
- Always replace after removing
- Unfastening and tightening
  => Page 250

12 Cross-head bolt

- Tightening torque:

=> Brake System; Repair Group 46

13 Brake disc

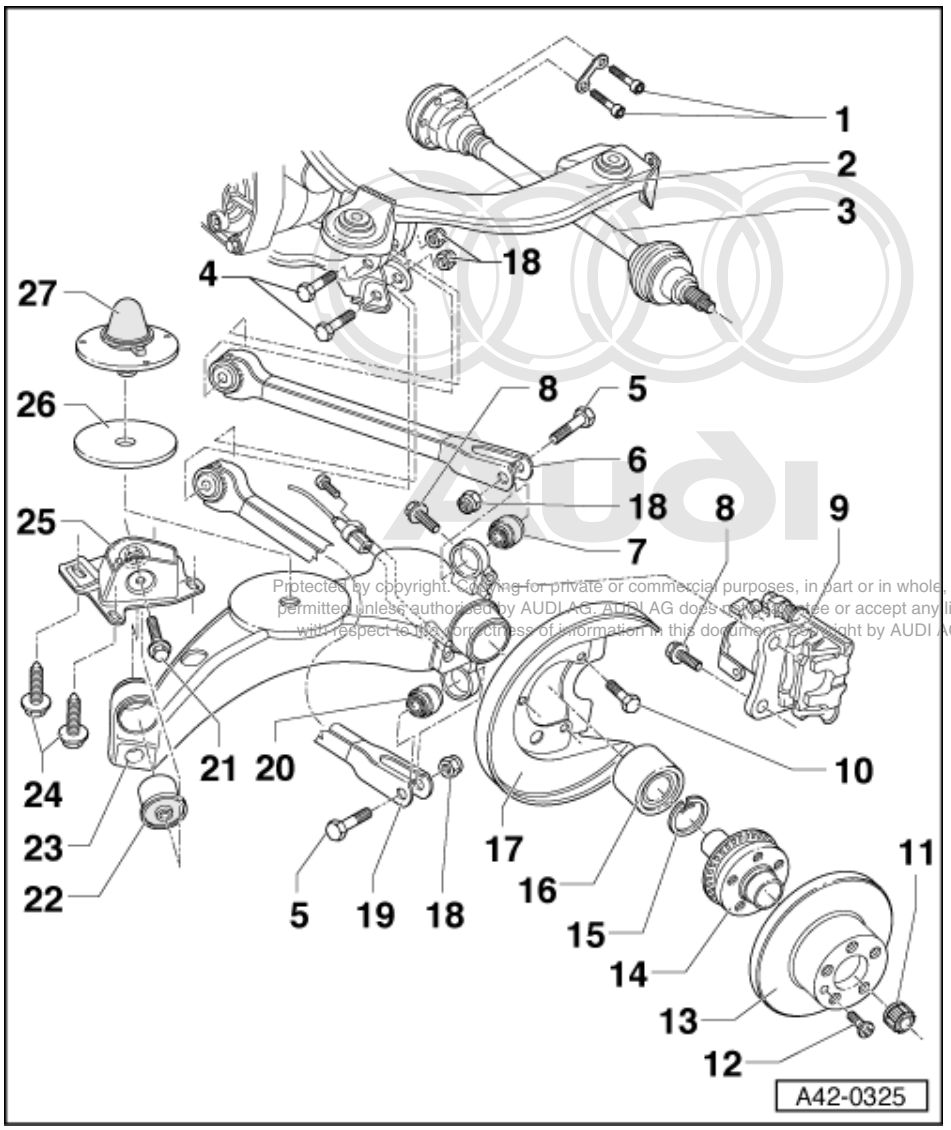
14 Wheel hub with rotor for speed sensor

- Rotor is welded to wheel hub
- Checking lateral runout of rotor

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=> Brake System; Repair Group 45

- Removing and installing=>Page 231



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15 Circlip

- Ensure firm attachment

16 Wheel bearing

- Replace; destroyed on pressing out
- Removing and installing=>Page 231

17 Splash plate

18 Nut - 70 Nm + further 90° (1/4) turn

- Self-locking
- Always replace after removing

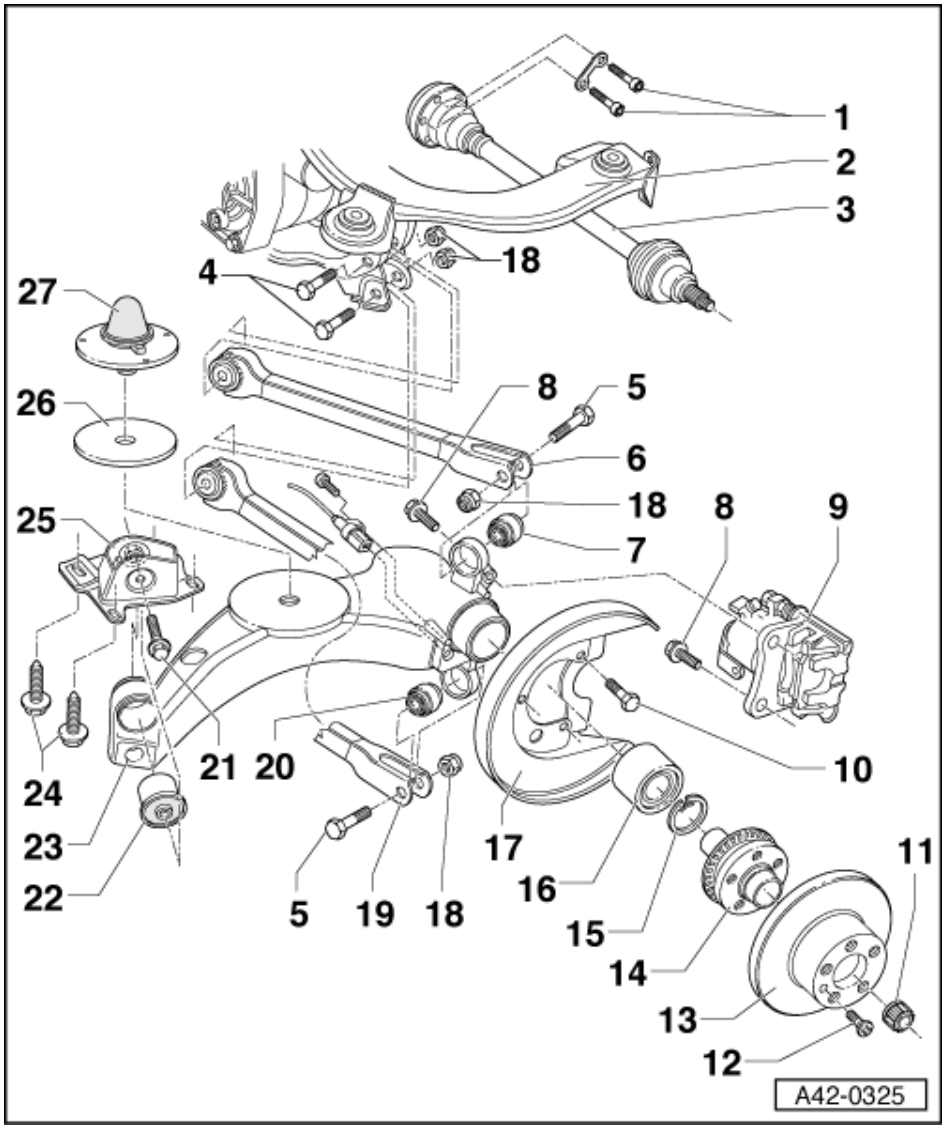
19 Lower transverse link

- Different versions are available; for correct assignment refer to

=> Parts List

- Same versionmust always be installed on left and right sides
  =>Page 216
- Removing and installing=>Page 228

- Removing and installing=>Page 228



20 Ball joint

- Check rubber bellows for damage and cracks
- New version: bonded rubber bush =>Page 216
- Removing and installing=>Page 221

21 Bolt, 90 Nm

- Always replace after removing

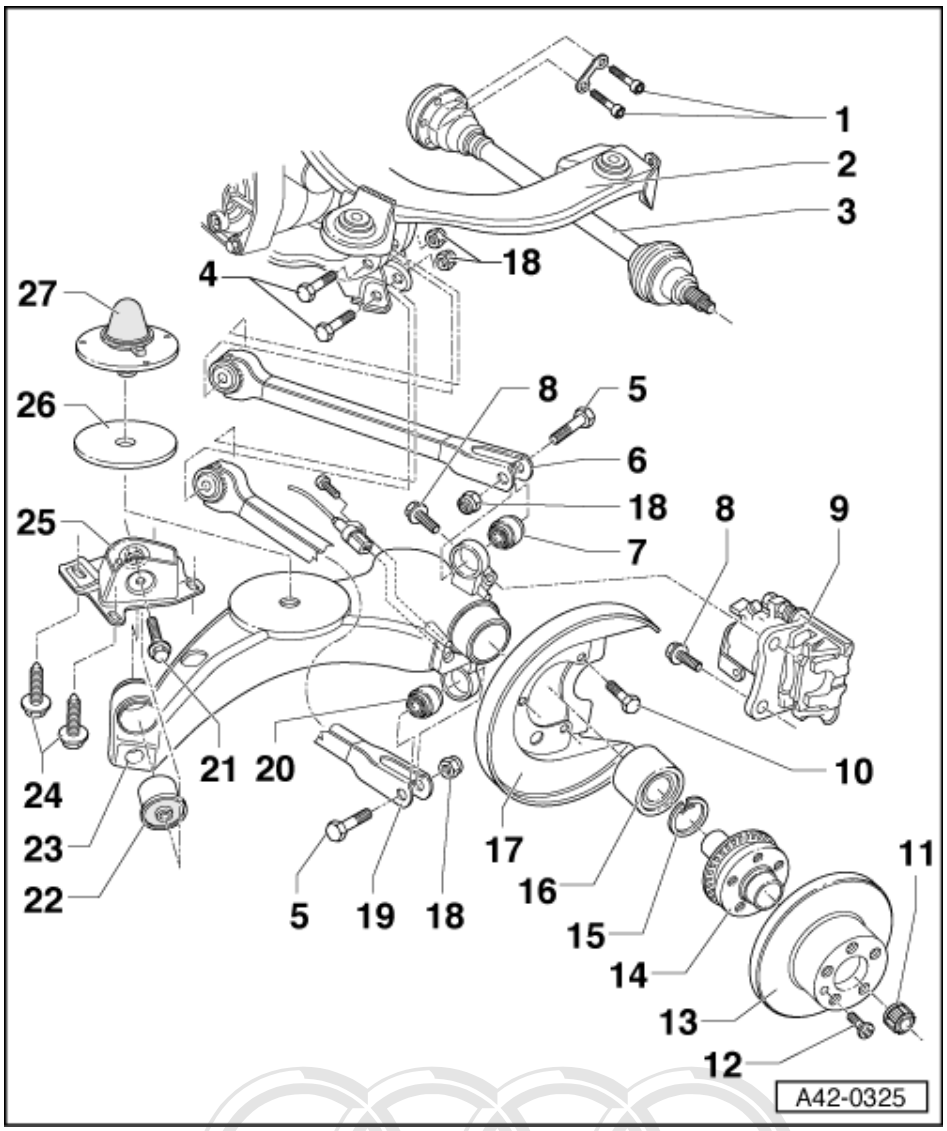
22 Bonded rubber bush

- Removing and installing=>Page 218

23 Trailing arm

- Different versions => Fig. 1
- Removing and installing=>Page 224

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24 Bolt, 75 Nm

- Always replace after removing

25 Mounting bracket for rear axle

- After installation, check and if necessary adjust overall toe of rear axle
- Toe can be corrected by moving mounting bracket

26 Spacer

- For vehicles with heavy-duty running gear only; distinguishing feature => vehicle data sticker, Page 1

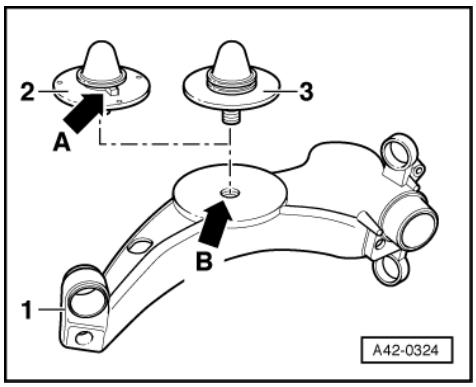
27 Buffer stop

- Different versions => Fig. 1
- Tighten version with threaded pin to 10 Nm

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2.9 - Change from ball joints to bonded rubber bushes

As of 2003 model year, bonded rubber bushes are installed instead of ball joints. Mixed installation of bonded rubber bushes and ball joints or different versions of transverse links is not permissible.



-> Fig.1 Different trailing arms and buffer stops

A modified trailing arm -1- and a modified buffer stop -2- have been fitted as of approx. 06.99.

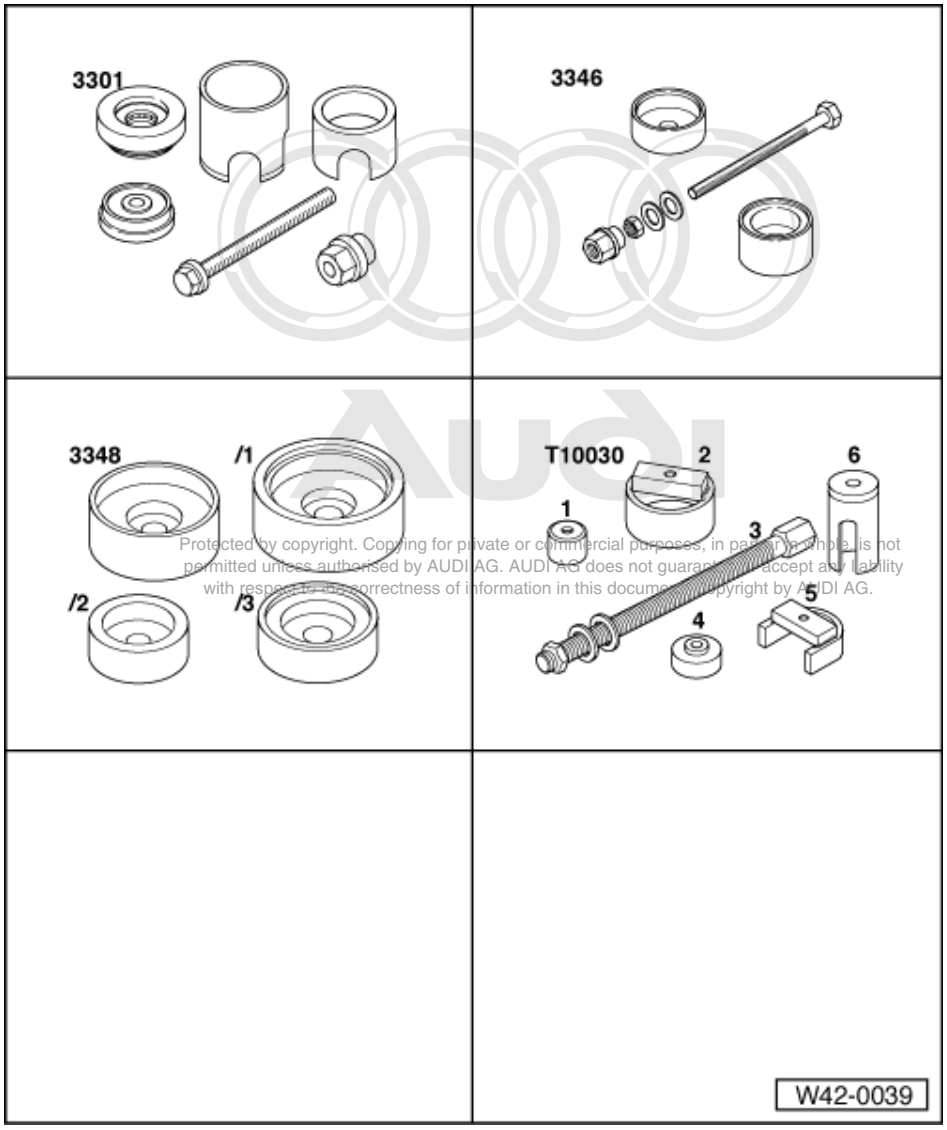
- Installation of a new buffer stop -2- with locating pin in a trailing arm prior to 06.99 involves enlarging thread -arrow B- in trailing arm to ø 10.5 mm. Locating pin on underside also has to be cut off.
- Heed the following on installation: Start of spring winding must make contact with web -arrow A-.

Note:

Buffer stop -3- with threaded pin (version up to approx. 06.99) is tightened to 10 Nm.

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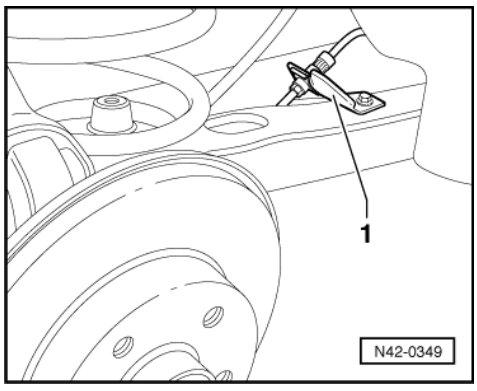
2.10 - Replacing bonded rubber bush for trailing arm



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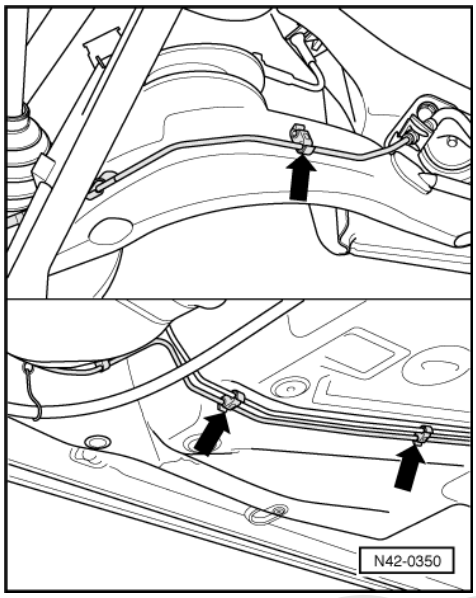
Special tools and workshop equipment required

- Assembly device 3301
- Assembly device 3346
- Assembly device 3348
- Assembly device T10030

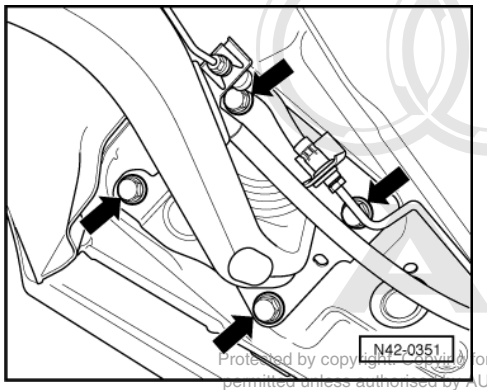


Sequence of operations

- Remove spring => Page 204 .
- -> Unscrew holder -1- for brake pipe from trailing arm.

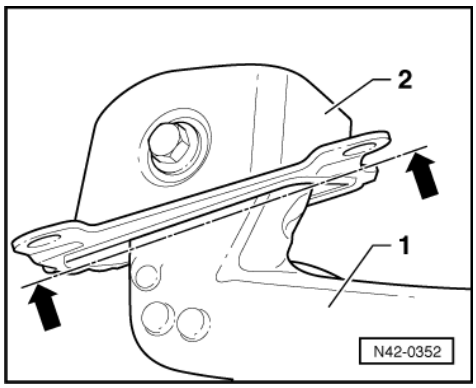


- -> Unclip brake pipe from holder -arrows-.



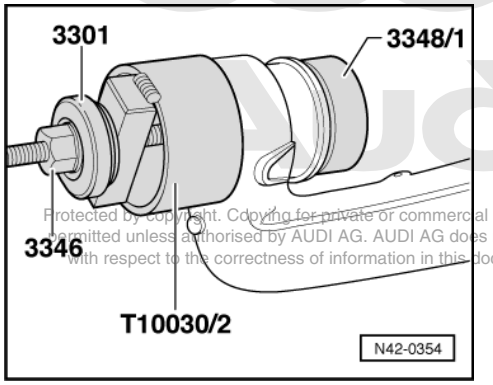
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- Mark installation position of mounting bracket on body.
- -> Unscrew mounting bracket from body -arrows-.



- -> Use waterproof felt-tip pen, for example, to mark installation position of mounting bracket with respect to trailing arm -dashed line; arrows-.

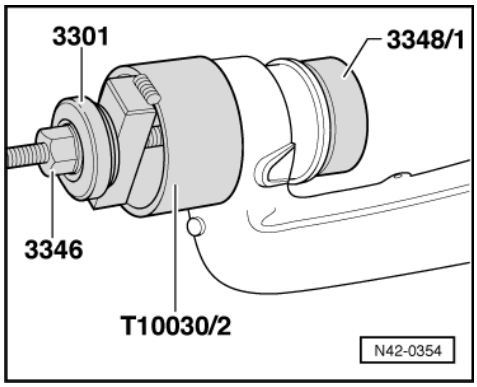
1 - Trailing arm
2 - Mounting bracket



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Extracting bonded rubber bush

- -> Apply special tools shown and extract bush by turning spindle.



Fitting bonded rubber bush

- -> Apply special tools shown and fit bush by turning spindle.

Perform further installation in reverse order, paying attention to the following:

Note:

If installation position of mounting bracket with respect to trailing arm was not marked, position must be determined => Page 227 .

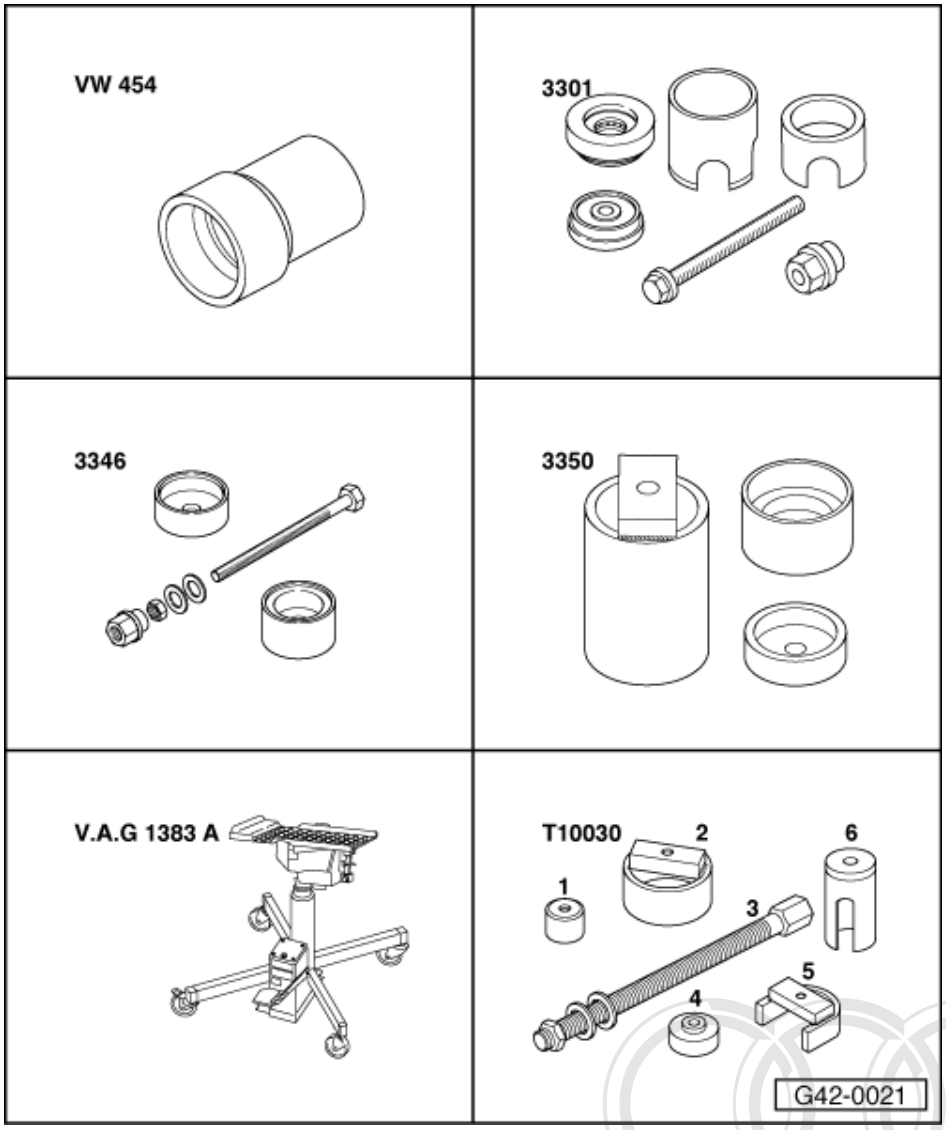
- Install spring => Page 207 .

Tightening torques

Component	Nm
Mounting bracket to trailing arm	90 1)
Mounting bracket to body	75 1)

1) Replace bolts

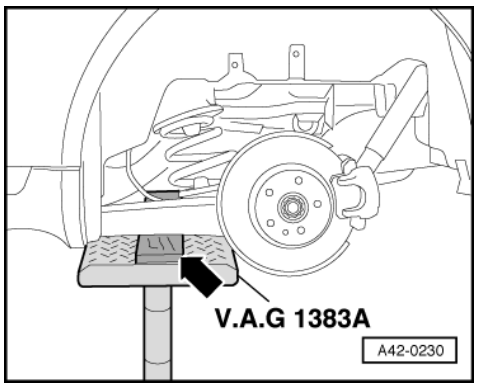
2.11 - Removing and installing ball joints



Special tools and workshop equipment required

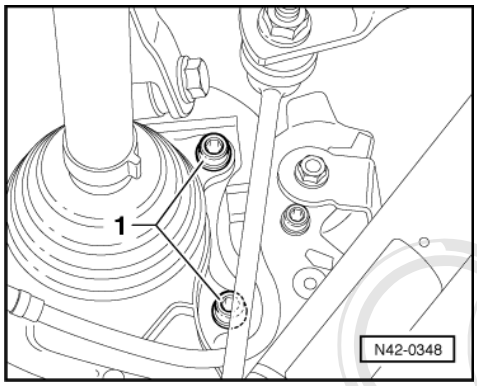
- Thrust pad VW 454
- Assembly device 3301
- Assembly device 3346
- Assembly device 3350
- Engine/gearbox lifter V.A.G 1383 A
- Assembly device T10030

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Removing

- Remove appropriate transverse link => Page 228 .
- -> Position engine/gearbox lifter V.A.G 1383 A with universal mount V.A.G 1359/2 and wooden block -arrow- beneath trailing arm.



Vehicles with ventilated rear brake discs:

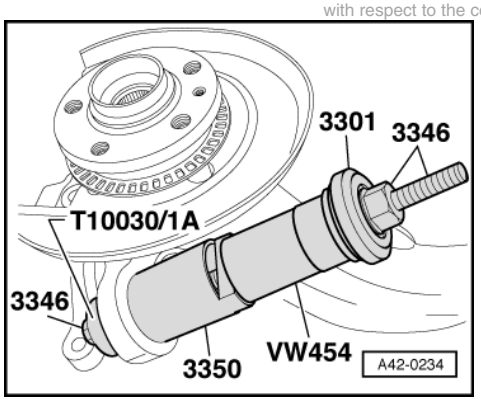
- -> Screw out hexagon socket-head bolts -1-.
- Detach brake caliper and hang up with piece of wire.

Note:

Brake hose/pipe is never to be twisted or kinked.

- Screw out cross-head bolt for brake disc and detach brake disc.

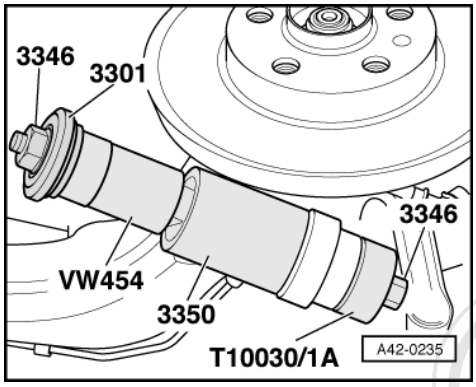
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Extracting lower ball joint

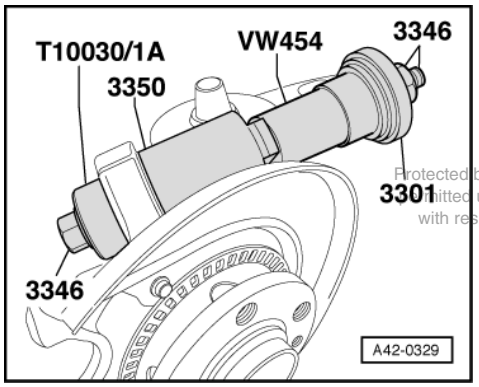
- Coat spindle with universal grease G 052 735 A5.

- -> Apply special tools shown and extract ball joint by turning spindle.



Fitting lower ball joint

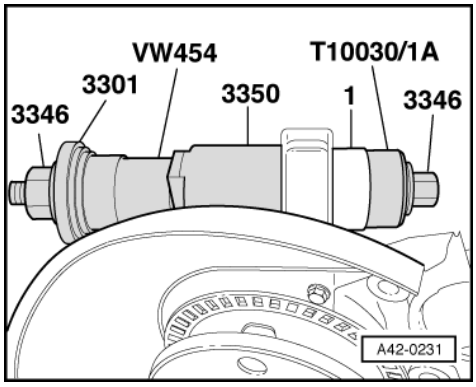
- -> Apply special tools shown and fit ball joint in centre position by turning spindle.



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Extracting upper ball joint

- Coat spindle with universal grease G 052 735 A5.
- -> Apply special tools shown and extract ball joint by turning spindle.



Fitting upper ball joint

- -> Apply special tools shown and fit ball joint -1- in centre position by turning spindle.

Installing

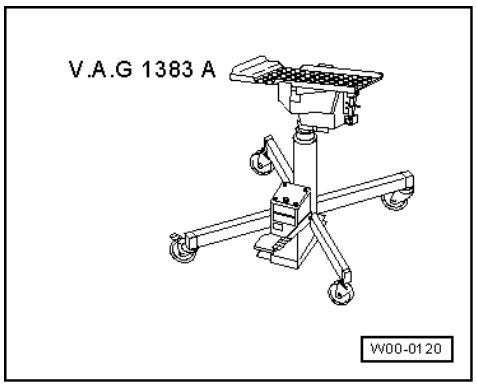
- Fit appropriate transverse link => Page 228 .

- If applicable, fit brake disc and brake caliper.

=> Brake System; Repair Group 46

- Install spring => Page 207 .

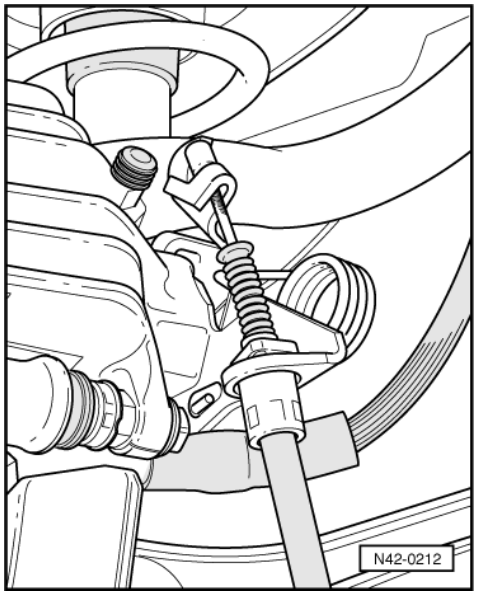
2.12 - Removing and installing trailing arm



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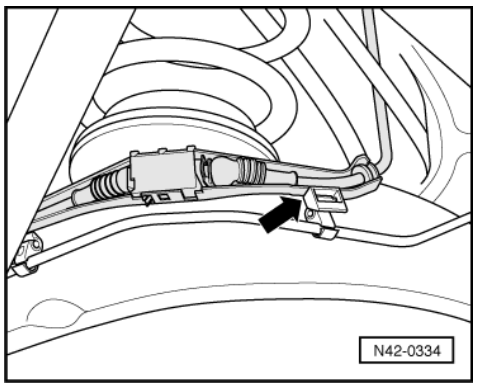
Special tools and workshop equipment required

- Engine/gearbox lifter V.A.G 1383 A

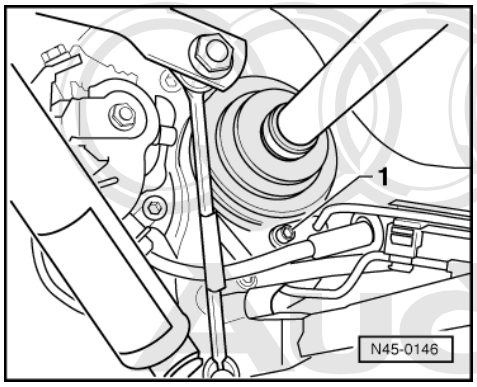


Removing

- Remove spring => Page 204 .
- -> Disengage handbrake cable at brake caliper.
- Pull handbrake cable out of trailing arm.
- Remove drive shaft => Page 251 .

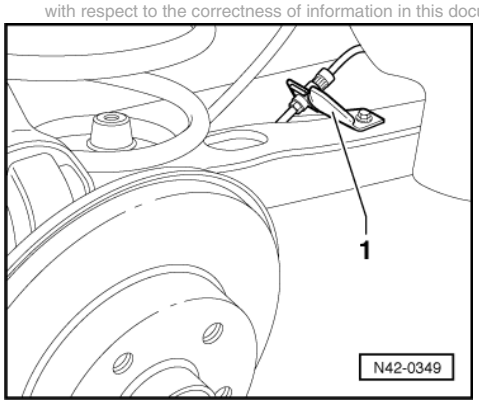


- -> Unclip speed sensor wire from holder -arrow-.

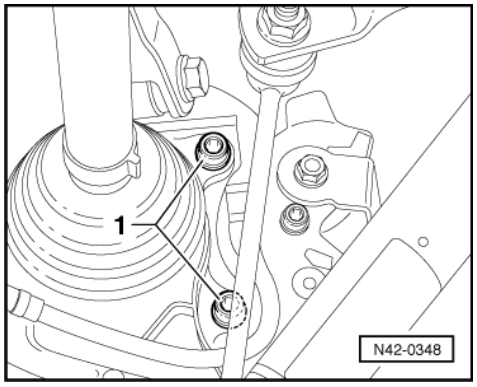


- -> Screw out bolt -1-.
- Pull speed sensor out of trailing arm.

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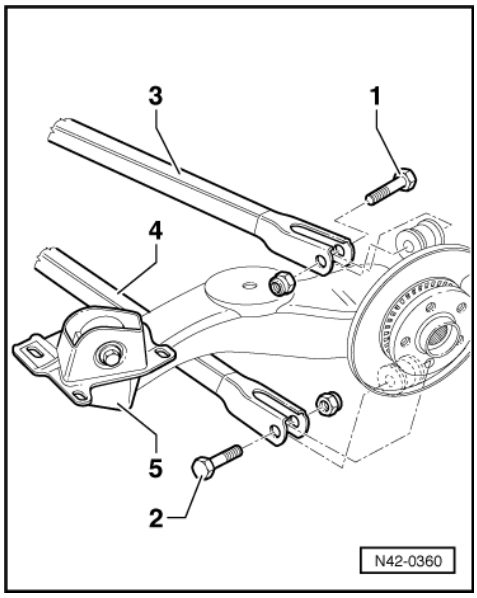


- -> Unscrew holder -1- for brake pipe from trailing arm.
- Unclip brake pipe from holder.



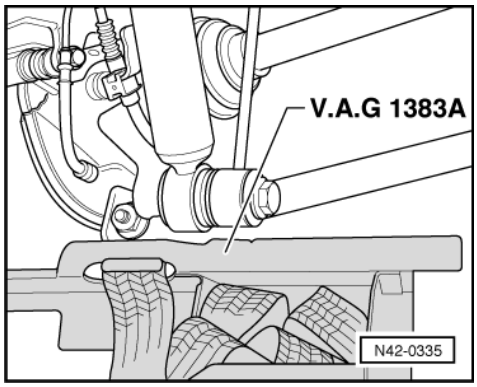
- -> Screw out hexagon socket-head bolts -1-.
- Detach brake caliper and hang up with piece of wire.

Note:
Brake hose/pipe is never to be twisted or kinked.
- Screw out cross-head bolt for brake disc and detach brake disc.

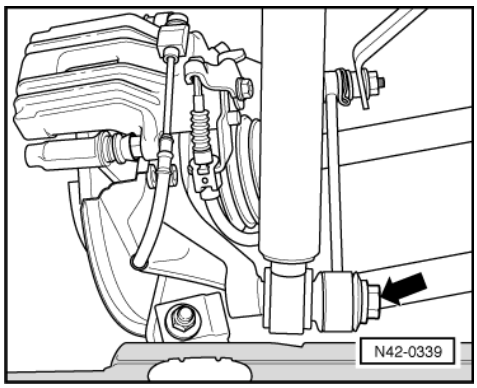


- -> Screw out bolts -1- and -2-.

3 - Upper transverse link
4 - Lower transverse link
5 - Trailing arm

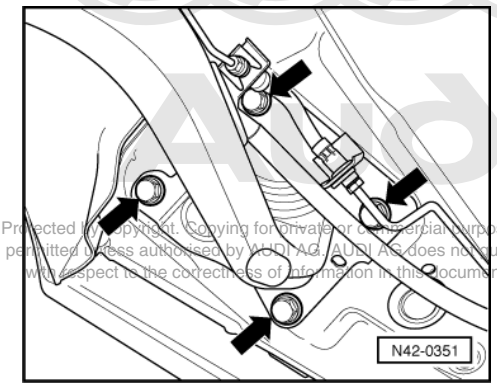


- -> Position engine/gearbox lifter V.A.G 1383 A under trailing arm.



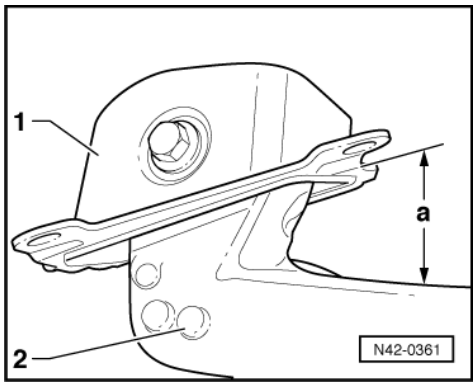
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- -> Screw out lower shock absorber bolt -arrow-.



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- Mark installation position of mounting bracket on body.
- -> Unscrew mounting bracket from body -arrows-.
- To do so, disconnect brake pipe.

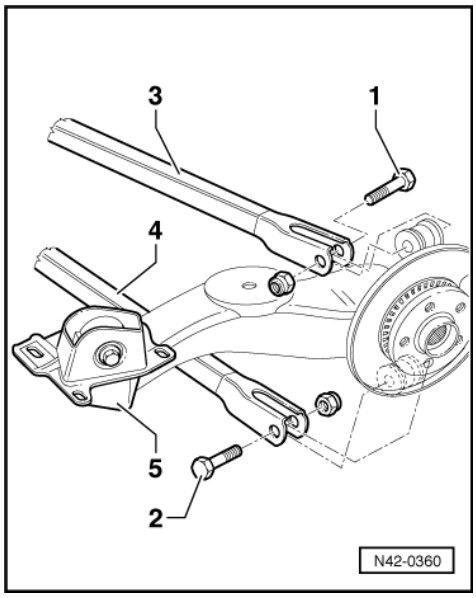


Installing

Install in reverse order, paying attention to the following:

-> Replacement of trailing arm -2- involves transferring mounting bracket -1- and adjusting it with respect to trailing arm.

- Dimension a = 53.5 ± 2 mm



- -> Pay attention to installation position of bolted joints at upper/lower transverse link.
- Install spring => Page 207 .
- Fit shock absorber => Page 210 .
- Install drive shaft => Page 253 .
- Fit brake disc and brake caliper.

=> Brake System; Repair Group 46

Tightening torques

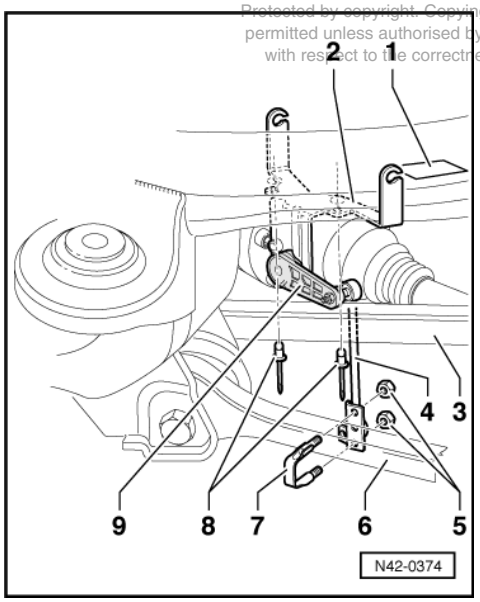
Component	Nm
Transverse link to subframe	70 + 90° 1)2)
Transverse link to trailing arm	70 + 90° 1)2)

1) 90°corresponds to quarter turn
2) Replace bolts and nuts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.
Perform wheel alignment after installation.

2.13 - Removing and installing transverse link

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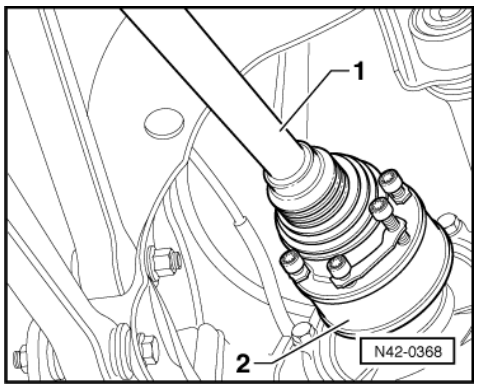


Removing

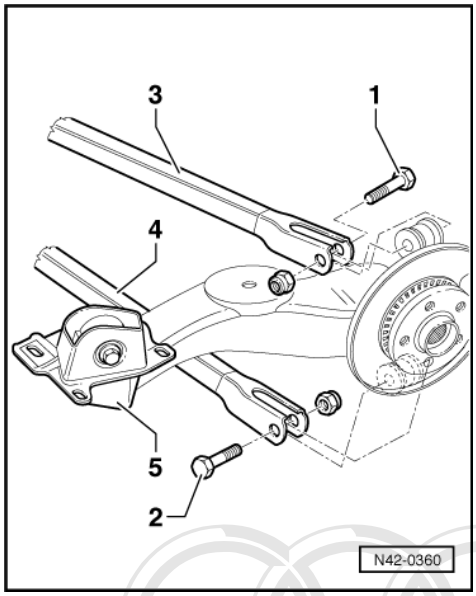
Note:

-> When replacing left transverse link on a vehicle with automatic headlight range control, mark installation position of clip -7- at transverse link -6- and transfer mark to new transverse link.

- Detach connecting link for headlight range control unit at left transverse link => Page 197 .

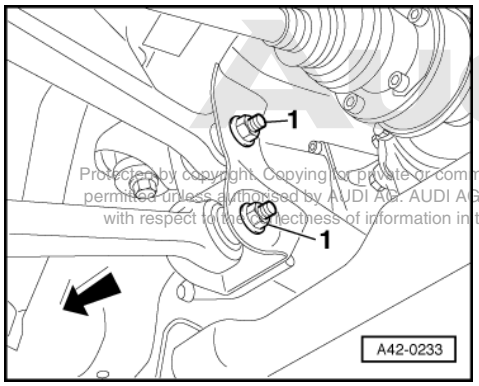


- -> Unscrew drive shaft -1- from flange shaft -2- of final drive.
- Remove spring => Page 204 .



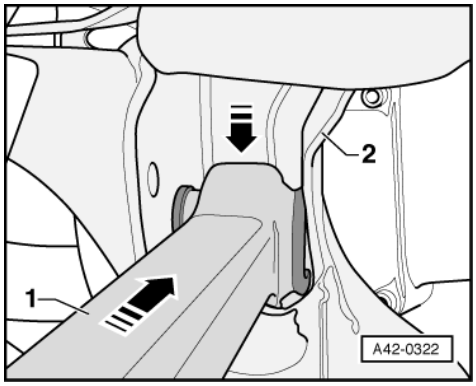
- -> Screw out bolt -1- for upper transverse link -3- at wheel bearing housing.
- Screw out bolt -2- for lower transverse link -4- at wheel bearing housing.

5 - Trailing arm



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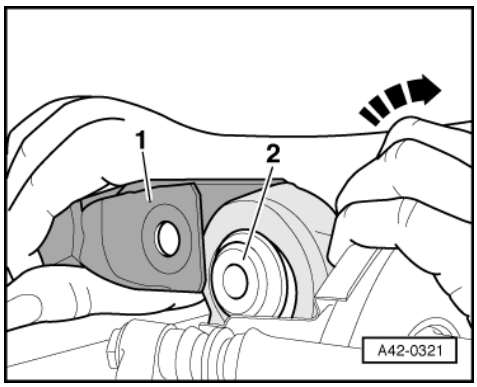
- -> Unscrew bolted joints -1- for upper/lower transverse link at subframe.
- Detach transverse links.



Installing

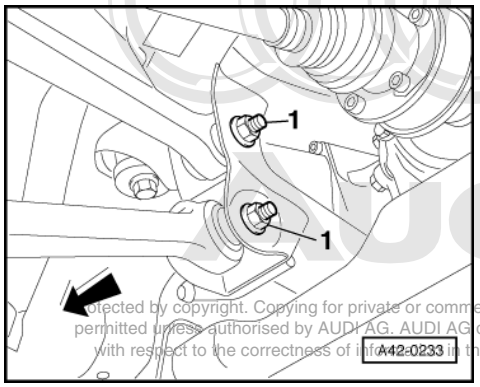
Install in reverse order, paying attention to the following:

- -> Start by sliding upper transverse link -1- as far as possible horizontally and vertically into subframe -2-.
- Align upper and lower ball joint for attachment to subframe to avoid damaging rubber bellows on inserting transverse links.



- -> Pull trailing arm slightly outwards to slide transverse link -1- over bearing.

Attention:
Take care not to damage rubber bellows of bearing.



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- -> Heed installation direction of bolts -1-:
  - Bolt heads face in direction of travel -arrow-
- Install spring => Page 207 .
- Install drive shaft => Page 253 .
- Install connecting link for headlight range control unit => Page 197 .

Tightening torques

Component	Nm
Transverse link to subframe	70 + 90° 1)2)
Transverse link to trailing arm	70 + 90° 1)2)

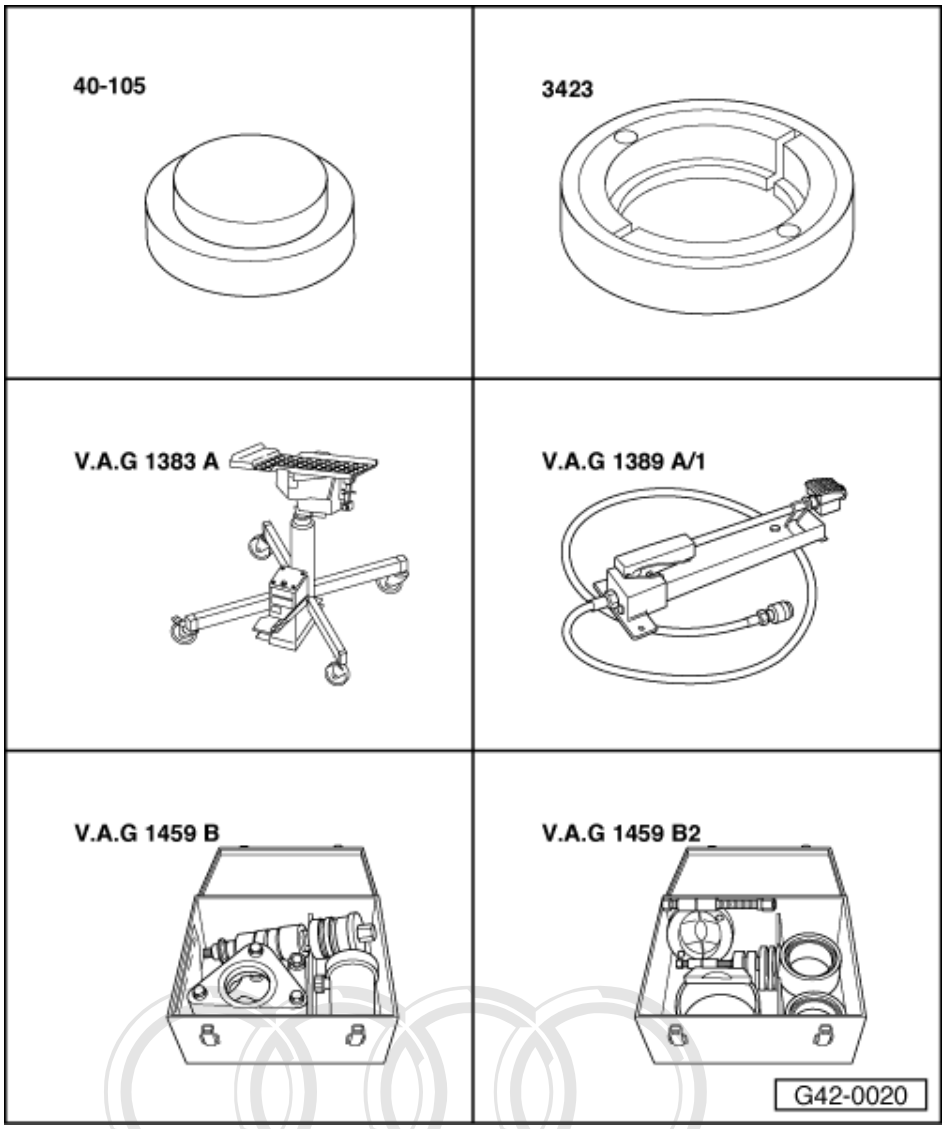
1) 90°corresponds to quarter turn

2) Replace bolts

Bolted joints with bonded rubber bushes must be tightened when vehicle is standing on its wheels.

Perform wheel alignment after installation.

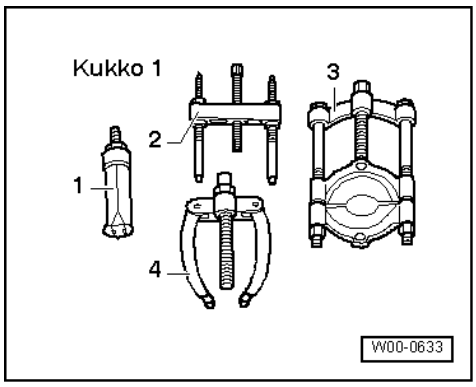
2.14 - Replacing wheel bearing



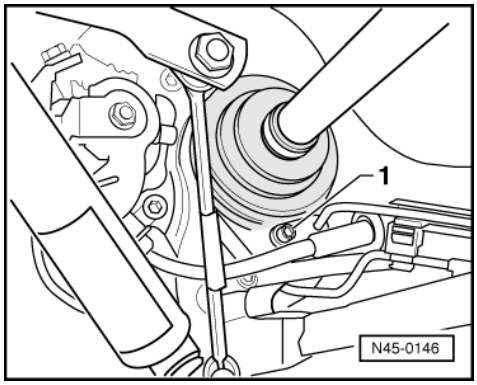
Special tools and workshop equipment required

- Thrust plate 40-105
- Puller 3423
- Engine/gearbox lifter V.A.G 1383 A
- Foot-operated pump with high-pressure hose V.A.G 1389 A/1
- Hydraulic removal and installation device V.A.G 1459 B
- Accessory set V.A.G 1459 B2

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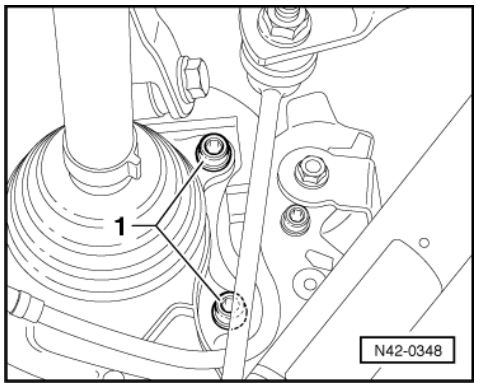


- 2 - Kukko 18/0 puller



Sequence of operations

- -> Screw out bolt -1-.
- Pull speed sensor out of trailing arm.
- Remove drive shaft => Page 251 .



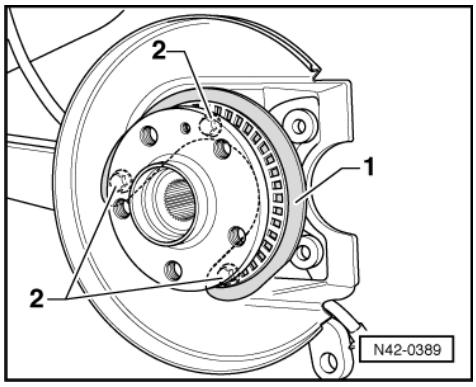
- -> Screw out bolts -1-.
- Detach brake caliper and hang up with piece of wire.

Note:

Brake hose/pipe is never to be twisted or kinked.

- Screw out cross-head bolt for brake disc and detach brake disc.

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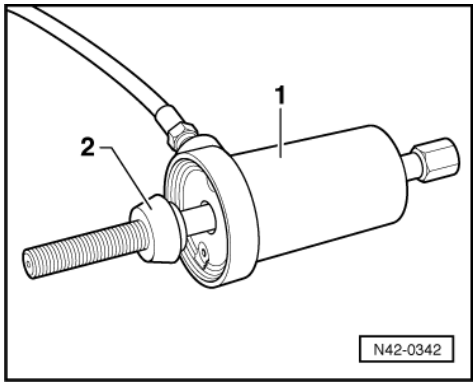
Pressing out wheel hub

- -> Insert thrust pad -1- as shown.

  1 - Thrust pad E-39

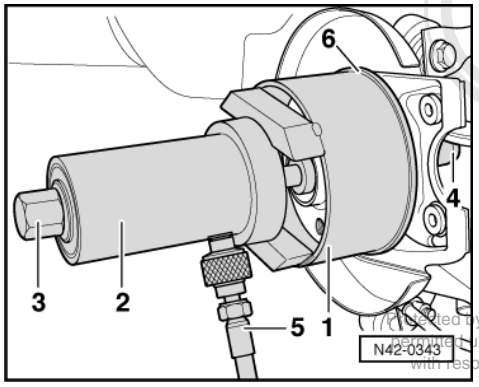
Note:

Position thrust pad such that it rests completely on bolt heads -2-.



- -> Fit centring device with clamp -2- at hollow plunger cylinder -1-.

  1 - Hollow plunger cylinder HKZ-15 with thrust pad E-0-204-T, hydraulic
  2 - Centring device with clamp E-76-2



Audi
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- -> Fit bell -1-, hollow plunger cylinder -2- with pin -3- and special nut -4-.

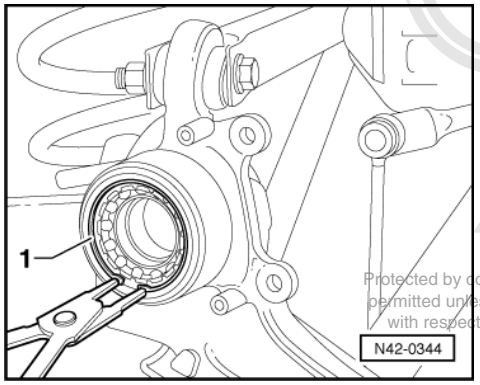
  1 - Bell E 40
  2 - Hollow plunger cylinder HKZ-15
  3 - Pin E-0-217
  4 - Special nut E-8-214

5 - High-pressure hose with quick-release coupling
6 - Thrust pad E-39

- Build up pressure with foot-operated pump.
- Then check whether all tools are properly centred.

Attention:
Place engine/gearbox lifter V.A.G 1383

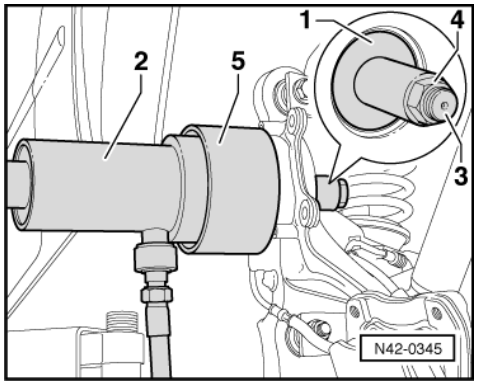
- Press wheel hub out of wheel bearing by way of pump action.



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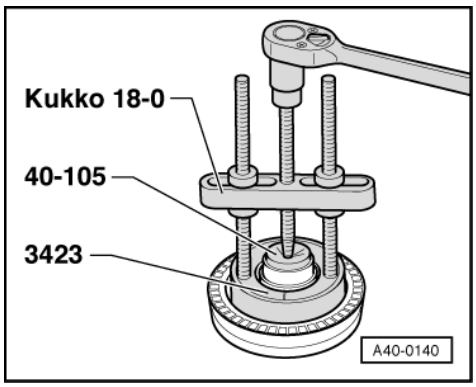
Pressing out wheel bearing

- -> Use commercially available circlip pliers to take out circlip -1-.



- -> Position thrust pad -1- on back of wheel bearing.
- Place hollow plunger cylinder -2- with pin -3- and special nut -4- in position.
- Build up pressure with foot-operated pump.
- Then check whether all tools are properly centred.
- Press out wheel bearing by way of pump action.

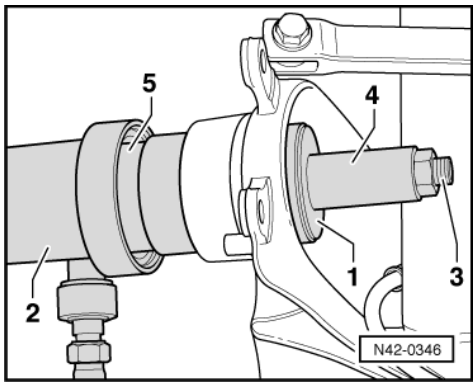
1 - Thrust pad E-5
2 - Hollow plunger cylinder HKZ-15
3 - Pin E-0-217
4 - Special nut E-8-214
5 - Bell E-44



Detaching bearing inner race from wheel hub

- -> Apply special tools shown and extract bearing inner race by turning spindle.

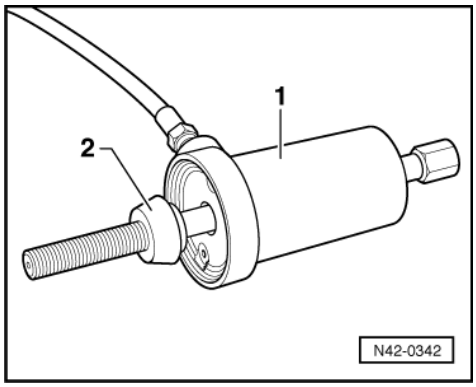
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Pressing in wheel bearing

- Place wheel bearing in position at wheel bearing housing.
- -> Position thrust pad -1- on back of wheel bearing housing.
- Place hollow plunger cylinder -2- with pin -3-, special nut -4- and thrust pad in position.
- Build up pressure with foot-operated pump.
- Then check whether all tools are properly centred.
- Press in wheel bearing by way of pump action.

1 - Thrust pad E-6-1
2 - Hollow plunger cylinder HKZ-15
3 - Pin E-0-217
4 - Special nut E-8-214

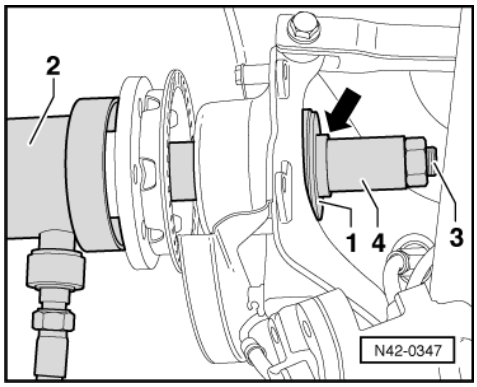


5 - Thrust pad E-13-1

- Use pointed-nose pliers to insert circlip.

Pressing in wheel hub

- Place wheel hub in position at wheel bearing.
- -> Fit centring device with clamp -2- at hollow plunger cylinder -1-.



- -> Position thrust pad -1- on back of wheel bearing housing.
- Place hollow plunger cylinder -2- with pin -3-, special nut -4- and thrust pad in position.
- Build up pressure with foot-operated pump.
- Then check whether all tools are properly centred.
- Press in wheel hub with foot-operated press.

Shoulder -arrow- of thrust pad E-5 must face special nut -4-.

1 - Thrust pad E-5
2 - Hollow plunger cylinder HKZ-15
3 - Pin E-0-217
4 - Special nut E-8-214

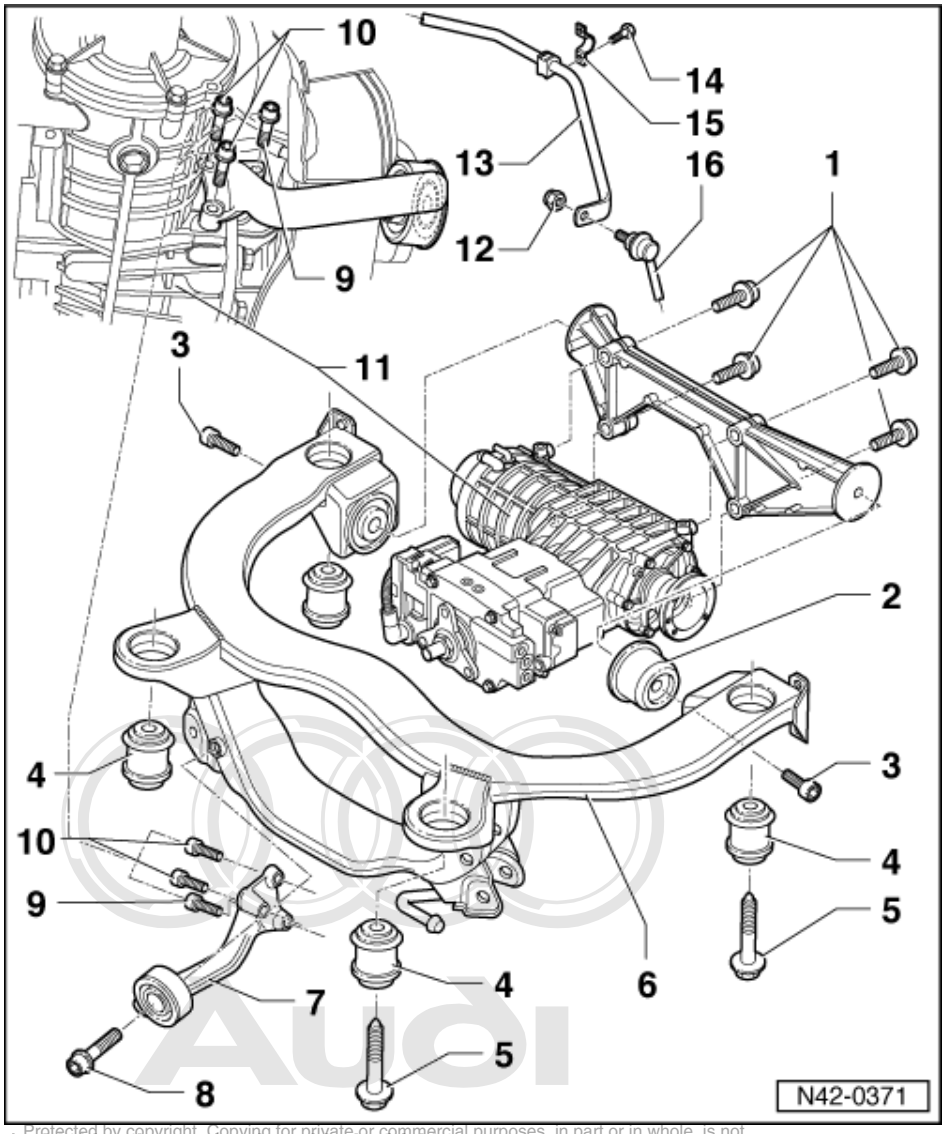
Perform further installation in reverse order, paying attention to the following:

- Install drive shaft => Page 253 .
- Fit brake caliper.

=> Brake System; Repair Group 46

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2.15 - Exploded view of subframe with final drive



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1 **Multi-point socket head bolt, 60 Nm**

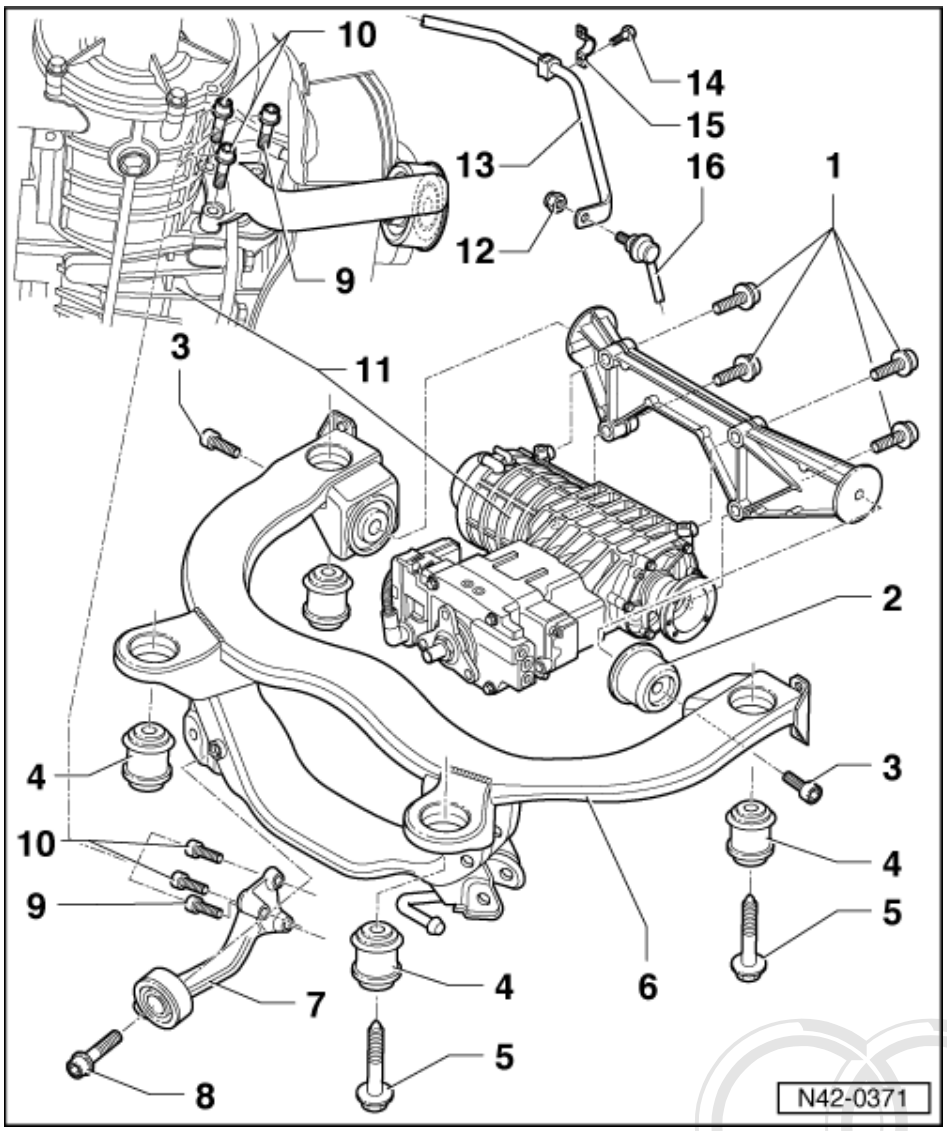
2 **Bonded rubber bush**

- For final drive
- Removing and installing
  => Page 248

3 **Multi-point socket head bolt, 60 Nm**

4 **Bonded rubber bush**

- For subframe
- Replacement parts are supplied in a sealed plastic bag
- Never use bonded rubber bushes which have been stored loose
- Removing and installing
  => Page 245



5 Bolt - 110 Nm + further 90° (1/4) turn
- Always replace after removing

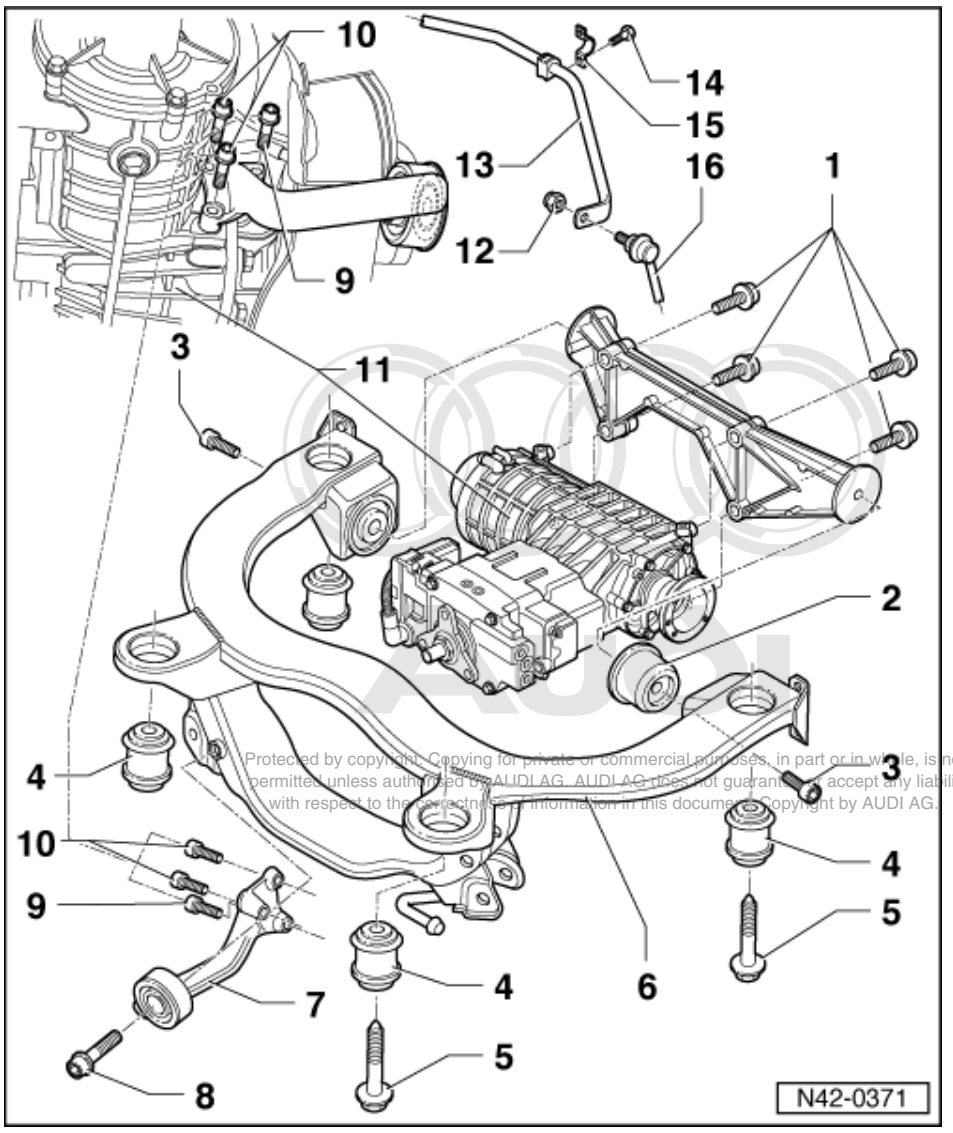
6 Subframe
- Removing and installing=>Page 240

7 Brace
- For final drive

8 Multi-point socket head bolt, 60 Nm

9 Hexagon socket-head bolt - 40 Nm + further 45° (1/8) turn
- M10 x 55
- Always replace after removing

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10 Hexagon socket-head bolt - 40 Nm + further 45° (1/8) turn

- M10 x 40
- Always replace after removing

11 Final drive

12 Nut, 25 Nm

- Self-locking
- Always replace after removing

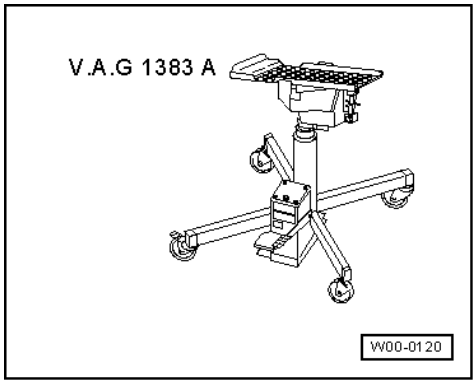
13 Anti-roll bar

14 Bolt, 20 Nm

15 Clip

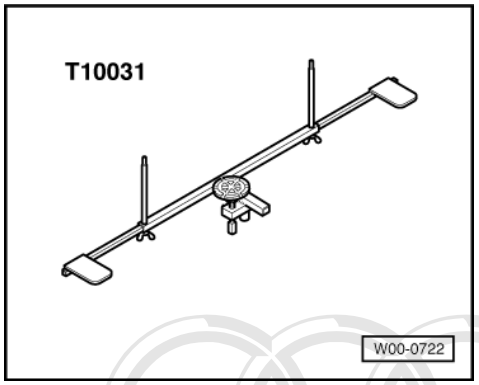
16 Connecting link

2.16 - Removing and installing subframe with final drive

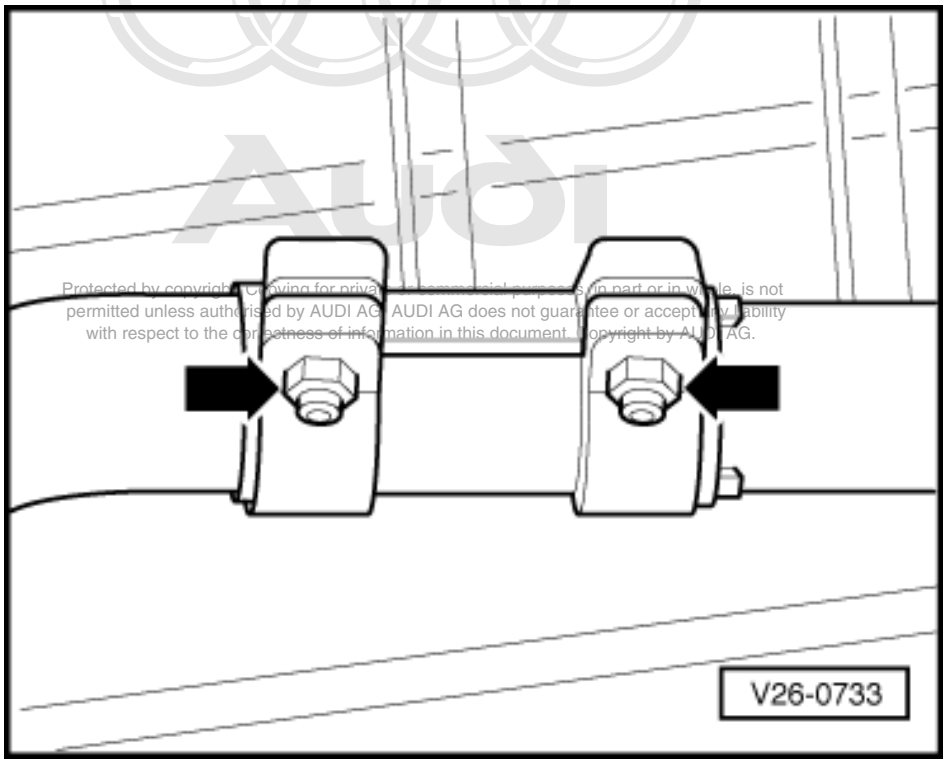


Special tools and workshop equipment required

- Engine/gearbox lifter V.A.G 1383 A



- Mount T10031



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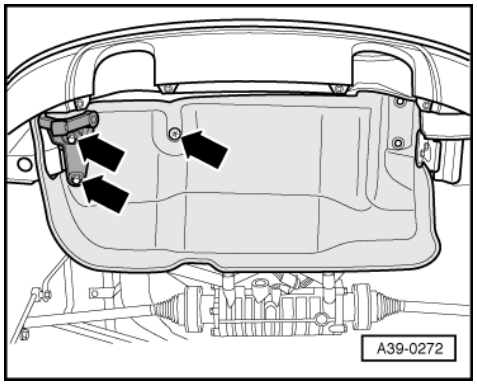
Removing

- Remove spring => Page 204 .
- Remove wheels.
- -> Separate exhaust system at clamp -arrows-.
- Remove rear section of exhaust system.

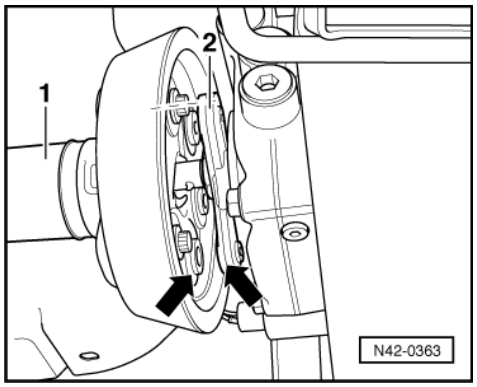
=> Engine, Mechanics; Repair Group 26

Note:

To avoid damage, decoupling element of exhaust system is never to be kinked by more than 10 °.

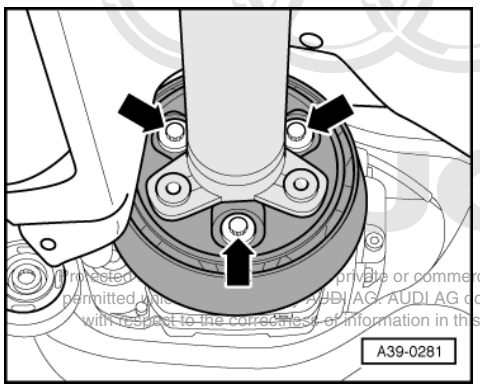


- -> Unscrew rear heat shield and exhaust system bracket -arrows-.



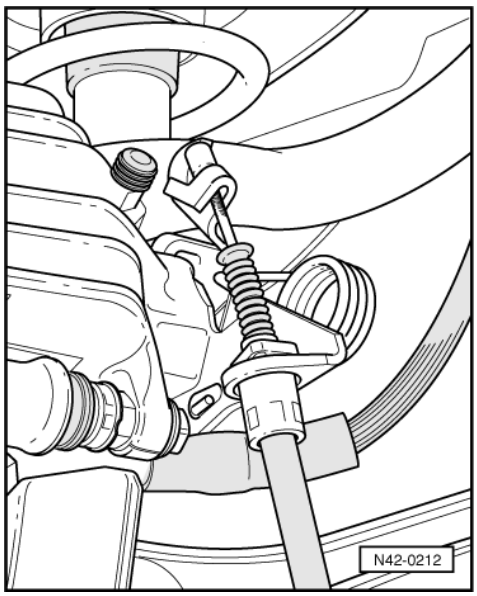
- -> Use paint to mark position of rear propshaft tube at final drive flange -arrows-.

1 - Propshaft with vibration damper
2 - Flange for propshaft



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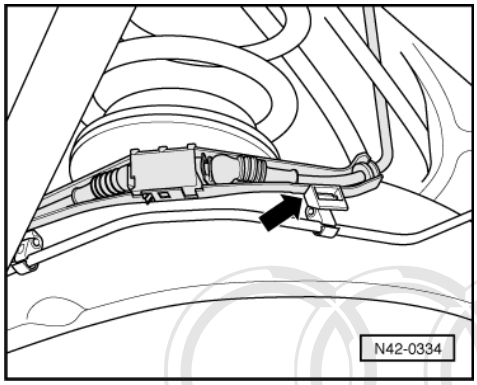
- -> Unscrew rear propshaft tube with flexible coupling and vibration damper from rear final drive -arrows-.



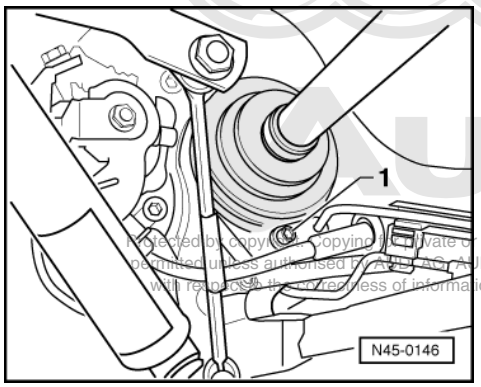
- -> Disengage handbrake cable at brake caliper.
- Pull handbrake cable out of trailing arm.

Note:

Handbrake cables need not be pulled out of trailing arm if subframe is merely to be lowered.

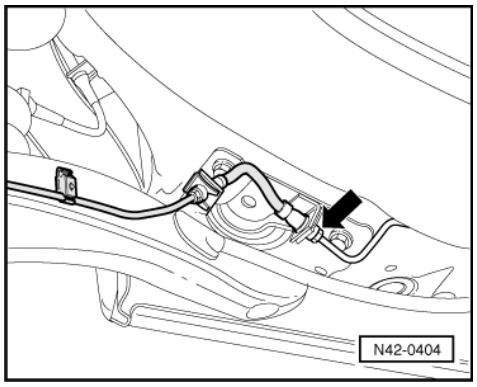


- -> Unclip speed sensor wire from holder -arrow-.

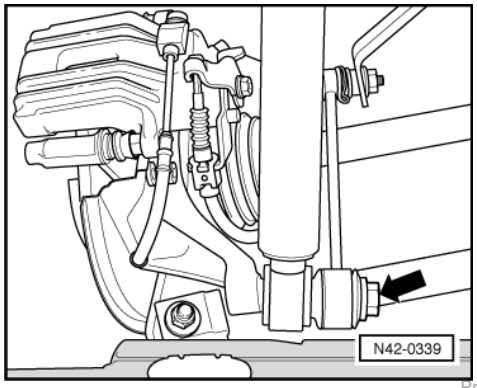


- -> Screw out bolt -1-.
- Pull speed sensor out of trailing arm.

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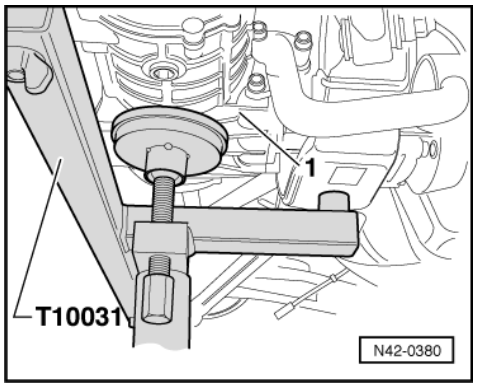


- -> Disconnect brake pipes at bolted joint -arrow- (seal pipes with plugs).

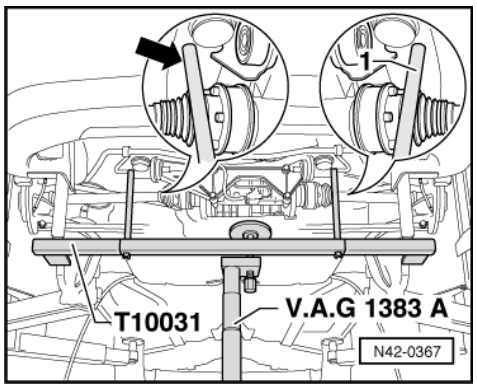


- -> Screw out lower shock absorber bolt -arrow-.
- Unplug connectors and disconnect vacuum pipes.

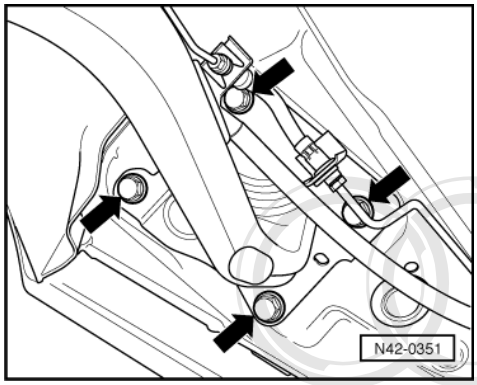
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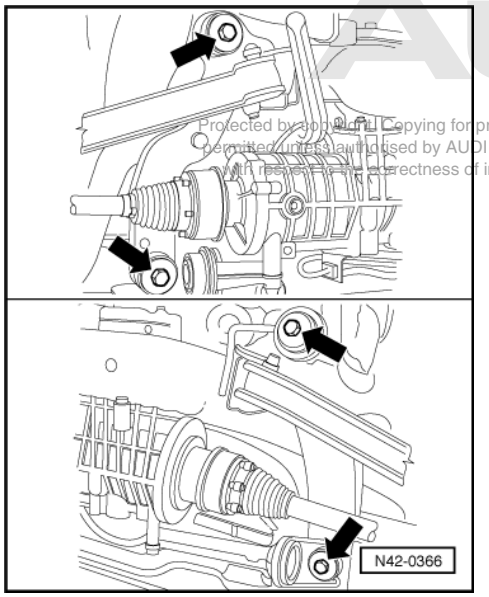
- -> Position engine/gearbox lifter V.A.G 1383 A with mount T10031 beneath rear axle -1-.



- -> Insert pins -arrow- and -1- in subframe holes.



- Mark installation position of mounting bracket on body.
- -> Unscrew mounting bracket from body -arrows-.



- -> Screw out subframe bolts -arrows-.
- Use engine/gearbox lifter V.A.G 1383 A to slowly lower subframe.
- Set down propshaft on heat shield.

Installing

Install in reverse order, paying attention to the following:

- Tighten bolts for subframe and mounting brackets at marked installation position.
- Install springs => Page 207 .
- Fit shock absorbers => Page 210 .
- Fit propshaft.
- Fit propshaft.

=> 5-speed Manual Gearbox 02C Four-wheel Drive/Final Drives; Repair Group 39

=> 5/6-speed Manual Gearbox 02M Four-wheel Drive/Final Drives; Repair Group 39

- Install exhaust system and perform stress-free alignment.

=> Engine, Mechanics; Repair Group 26

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- Fill and bleed brake system.

=> Brake System; Repair Group 47

Tightening torques

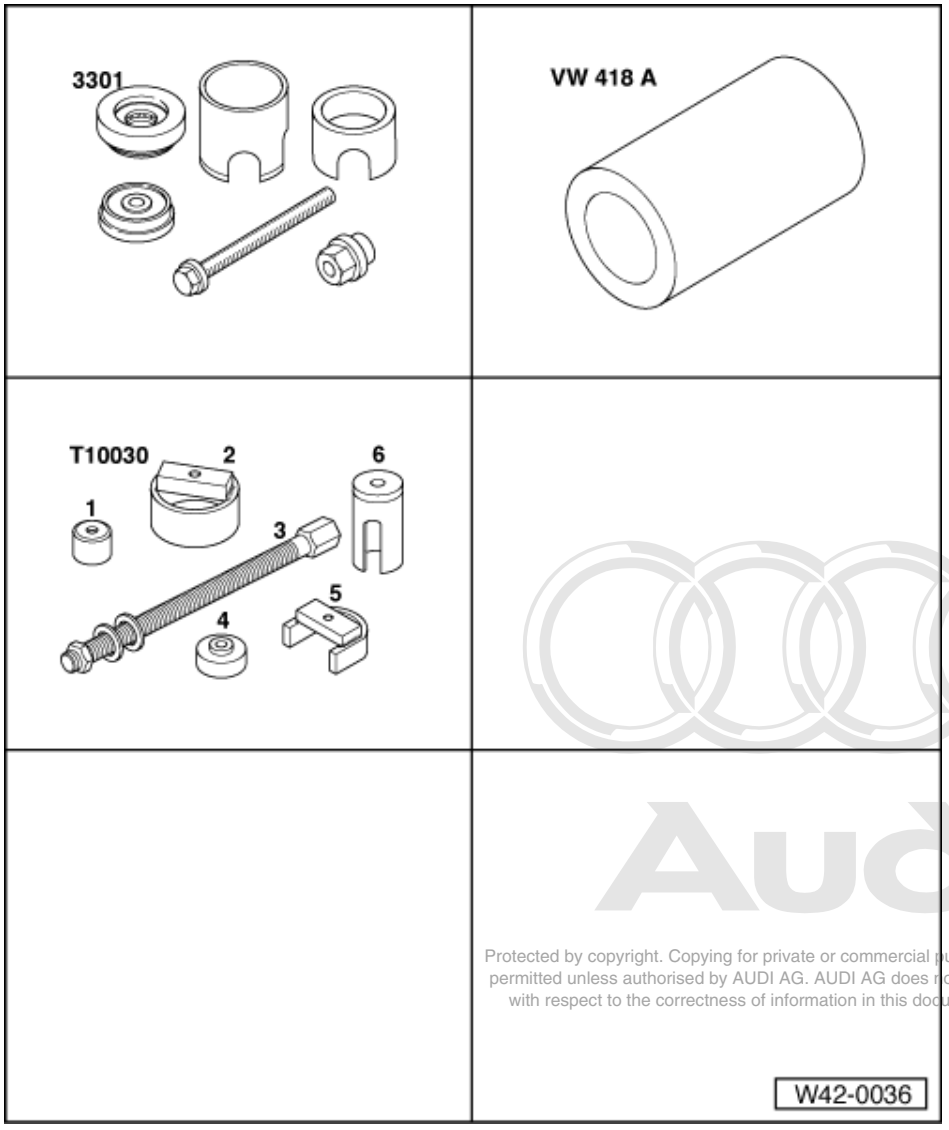
Component	Nm
Subframe to body	110 + 90° 1)2)
Mounting bracket to body	75 2)

1) 90°corresponds to quarter turn

2) Replace bolts

Perform wheel alignment after installation.

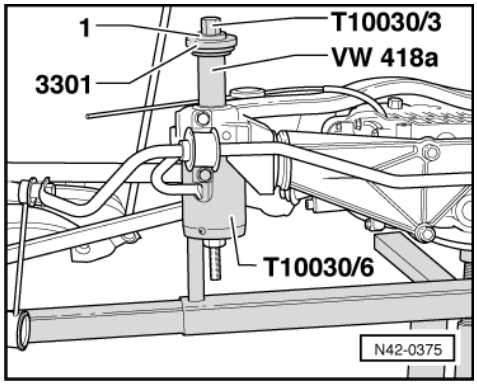
2.17 - Replacing subframe bonded rubber bushes



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Special tools and workshop equipment required

- Assembly device 3301
- Tubular section VW 418 A
- Assembly device T10030



Removing

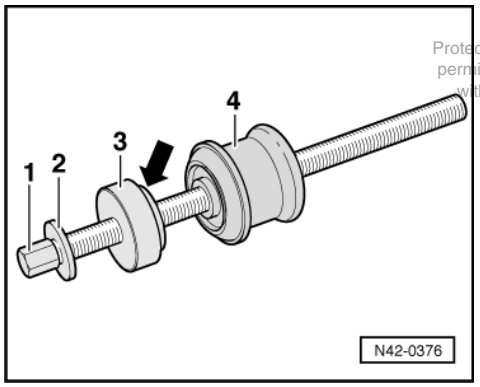
- Remove subframe with final drive => Page 240 .
- -> Apply special tools shown and extract bush by turning spindle.

1 - Washer

Note:

Spindle must be inserted from underneath for extracting and fitting front bonded rubber bushes at subframe.

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Installing

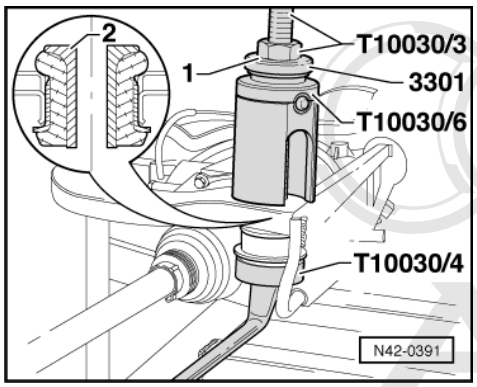
Install in reverse order, paying attention to the following:

Notes:

- Replacement bonded rubber bushes are supplied in a sealed plastic bag.
- Never use bonded rubber bushes which have been stored loose.

- -> Fit special tool with bonded rubber bush -4-.

1 - T10030/3 Spindle
2 - Chamfered washer
3 - 10030/4 Thrust pad
- Collar -arrow- faces bonded rubber bush



Notes:

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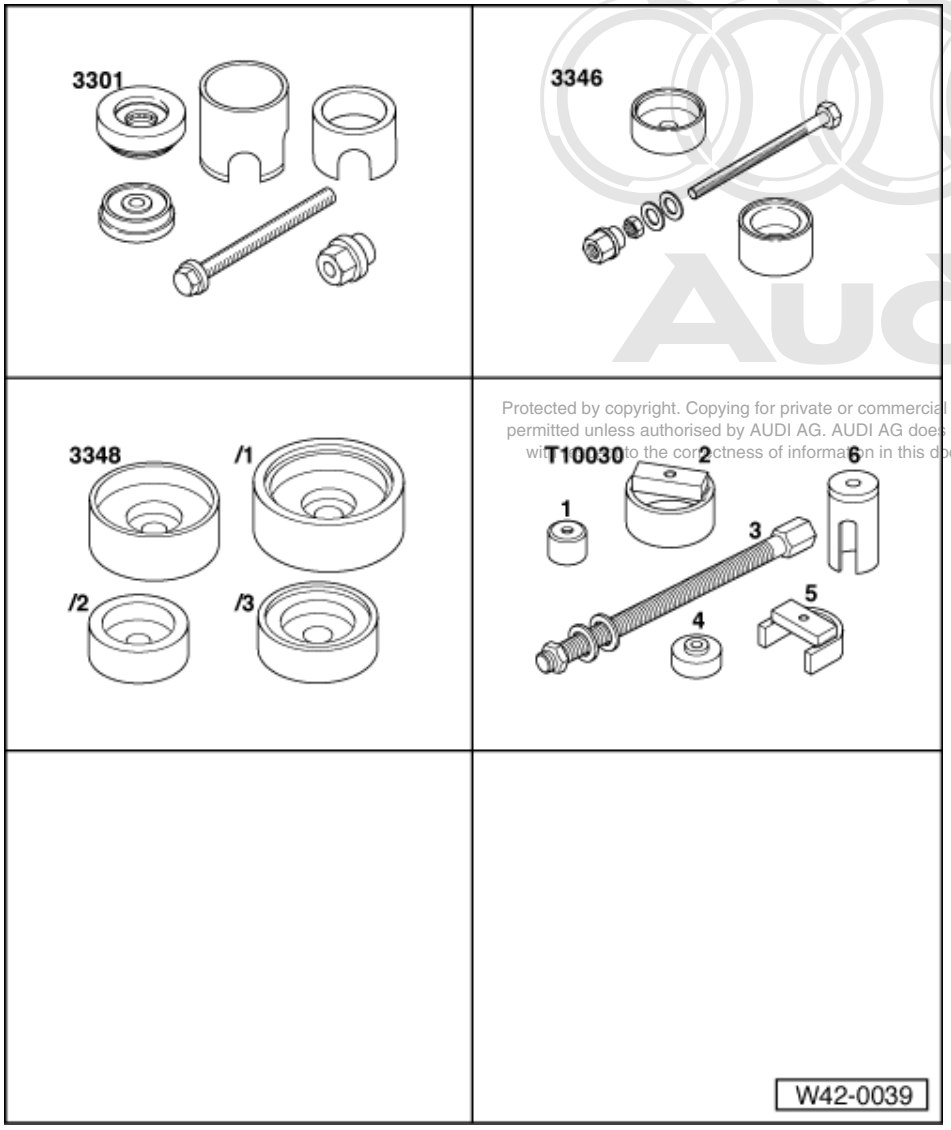
- For fitting, use acid-free assembly lubricant G 294 421 A1 =>General notes, Page 37 .
- Never use grease.

- -> Then place bonded rubber bush and special tools in position at subframe.
- Fit bonded rubber bush by turning spindle.

1 - Washer
2 - Installation position of bonded rubber bush in subframe

- Install subframe with final drive => Page 244 .

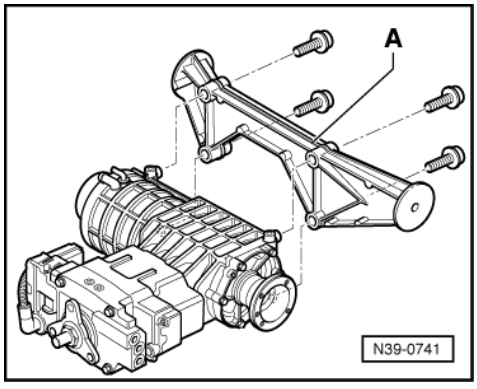
2.18 - Replacing final drive bonded rubber bushes



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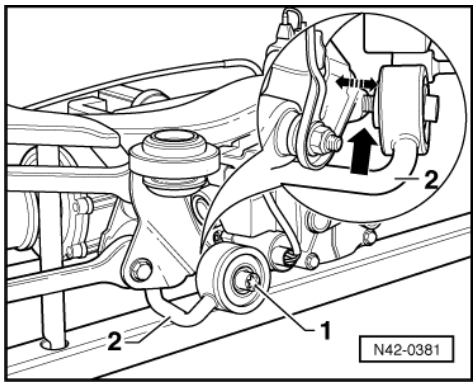
Special tools and workshop equipment required

- Assembly device 3301
- Assembly device 3346
- Assembly device 3348
- Assembly device T10030



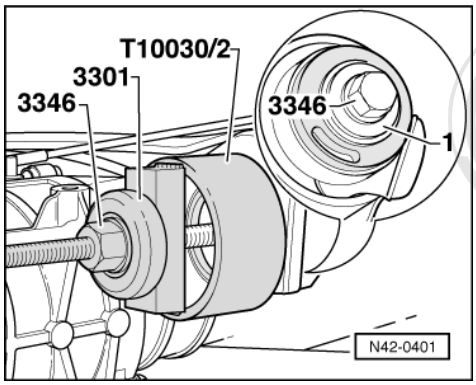
Removing

- Remove subframe with final drive => Page 240 .
- -> Detach cross member -A- from final drive.



- -> Slacken off multi-point socket head bolt -1-.
- Move final drive by 15...20 mm -arrow-.

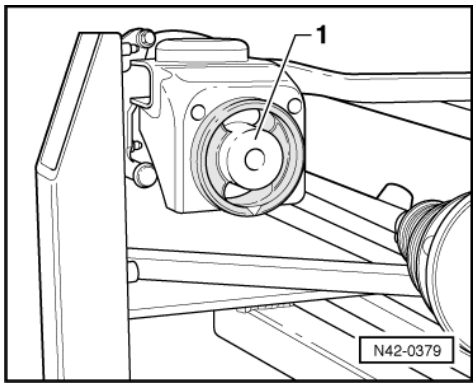
2 - Brace for final drive



- -> Apply special tools shown and extract bush by turning spindle.

1 - Washer

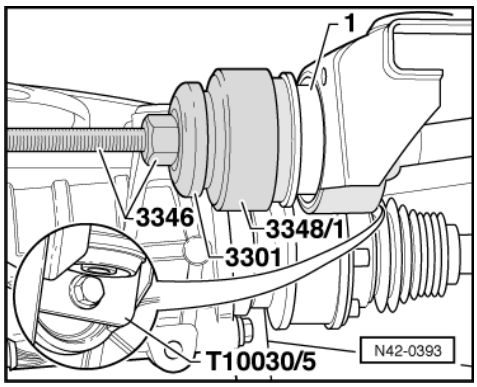
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Installing

Install in reverse order, paying attention to the following:

-> Installation position: Arrow on bonded rubber bush -1- must point upwards or downwards.



- -> Apply special tools shown and fit bush -1- by turning spindle.
- Install subframe with final drive => Page 244 .

Tightening torques

Component	Nm
Cross member for final drive to subframe	60
Brace for final drive to subframe	60

3 - Servicing rear drive shafts

3.1 - Servicing rear drive shafts

General:

Wheel bearings are not to be subjected to load after unfastening drive shaft bolted joint on wheel end.

Subjecting the wheel bearings to the dead weight of the vehicle would cause wheel bearing damage and shorten their service life. Attention is therefore to be paid to the following:

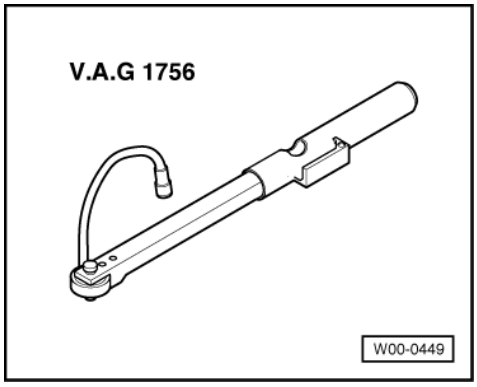
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Never move vehicles without drive shaft fitted, as otherwise wheel bearing damage will result. Should it nevertheless become necessary to move the vehicle, always heed the following:

- Procedure for unfastening twelve-point nut => Page 250

- Fit an outer joint instead of the drive shaft.
- Tighten the outer joint to 50 Nm.

3.2 - Unfastening and tightening twelve-point nut of drive shaft bolted joint



Special tools and workshop equipment required

- Angle measuring wrench V.A.G 1756

Unfastening twelve-point nut

- To avoid wheel bearing damage, do not unfasten twelve-point nut by more than 90°with vehicle still standing on its wheels.
- Raise vehicle such that wheels are off ground.
- Have second mechanic press brake.
- Unscrew twelve-point nut.

Tightening twelve-point nut

- Replace twelve-point nut.
- Remove any paint remnants and/or corrosion at thread and splines of outer joint.
- Before fitting drive shaft, lubricate the following locations with polycarbamide grease, part no. G 052 142 A2:

  - Splines of outer joint
  - Wheel hub splines
  - Contact surface of twelve-point nut

  Insert outer joint as far as possible into wheel hub splines.
  Pull outer joint with twelve-point nut into wheel hub until it makes contact with wheel bearing.
  Lower vehicle, making sure that wheels do not as yet come into contact with ground.

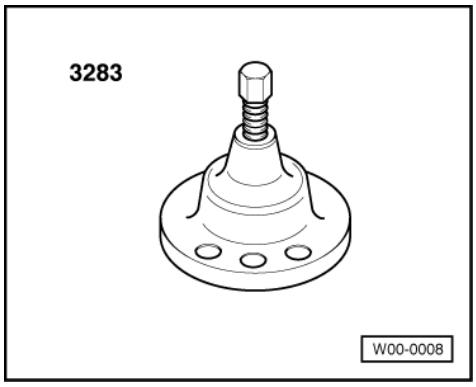
Note:

Wheels must not be in contact with ground when tightening drive shaft as otherwise wheel bearing could be damaged.

- Have second mechanic press brake.
- Tighten twelve-point nut to 250 Nm.
- Slacken off twelve-point nut by 360°(one turn).
- Tighten twelve-point nut to 50 Nm.
- Set vehicle down on its wheels.
- Give twelve-point nut further 60° turn.

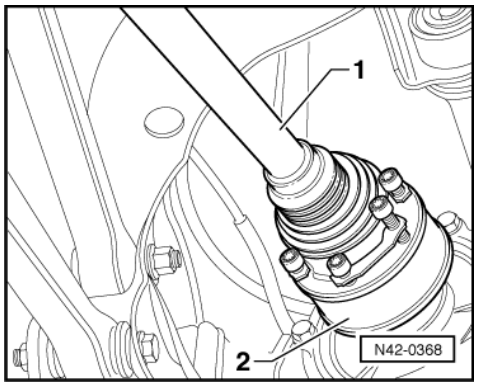
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3.3 - Removing and installing drive shafts



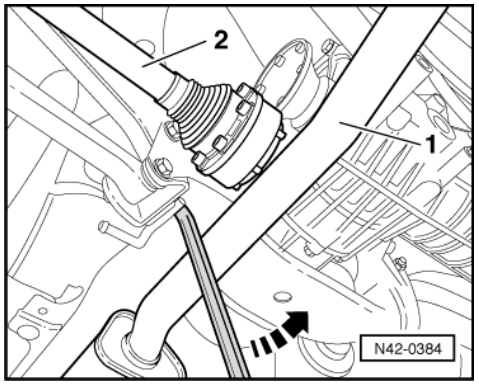
Special tools and workshop equipment required

- Pressing-out tool 3283



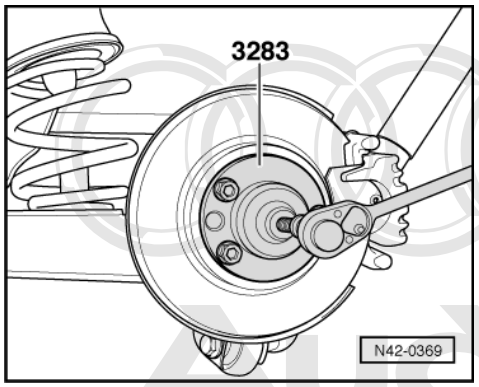
Removing

- Remove rear wheel.
- -> Unscrew drive shaft -1- from flange shaft -2- of final drive.



Left drive shaft:

- -> Use tyre iron to press exhaust system -1- to one side. Remove rear section of exhaust system if necessary.
- Detach inner joint of drive shaft -2- from final drive.



Both sides (continued):

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- -> Apply pressing-out tool 3283 and press drive shaft out of wheel bearing housing.

Note:

Ensure adequate clearance when pressing out drive shaft.

- Take out drive shaft.

Installing

Install in reverse order, paying attention to the following:

- Insert drive shaft.
- Place inner joint of drive shaft in position and pre-tighten bolts diagonally to 10 Nm.
- Diagonally finish-tighten multi-point socket head bolts to stipulated torque.
- Tighten drive shaft bolted joint on wheel end.
  - Procedure for tightening twelve-point nut => Page 250

Tightening torque

Component	Nm
Drive shaft to flange shaft	40

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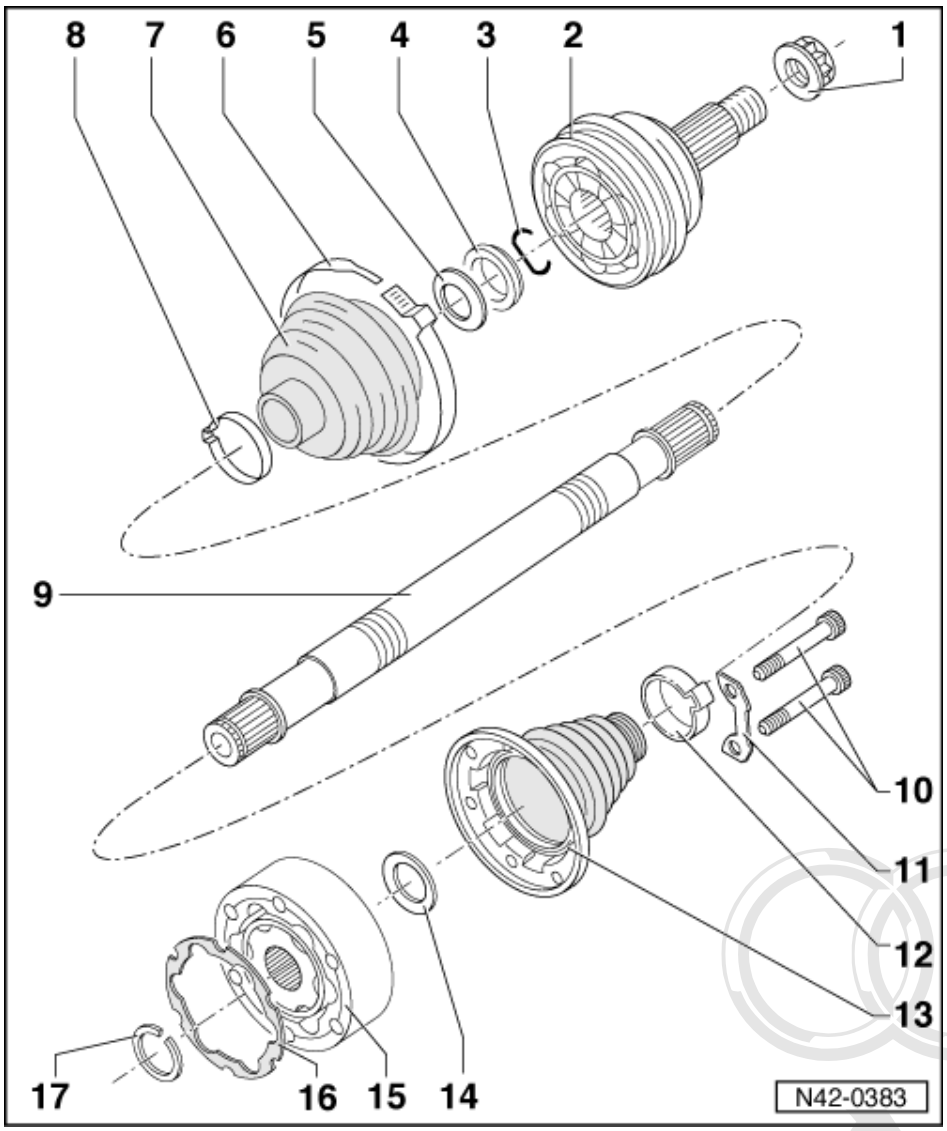
3.4 - Servicing drive shaft with constant velocity joint

Grease fill of joints

Grease G 000 603	Outer joint ø 90 mm	Inner joint ø 100 mm
Total quantity	90 g	120 g
In joint	40 g	50 g
In boot	50 g	70 g

Note:

Re-grease joint on replacing boot.



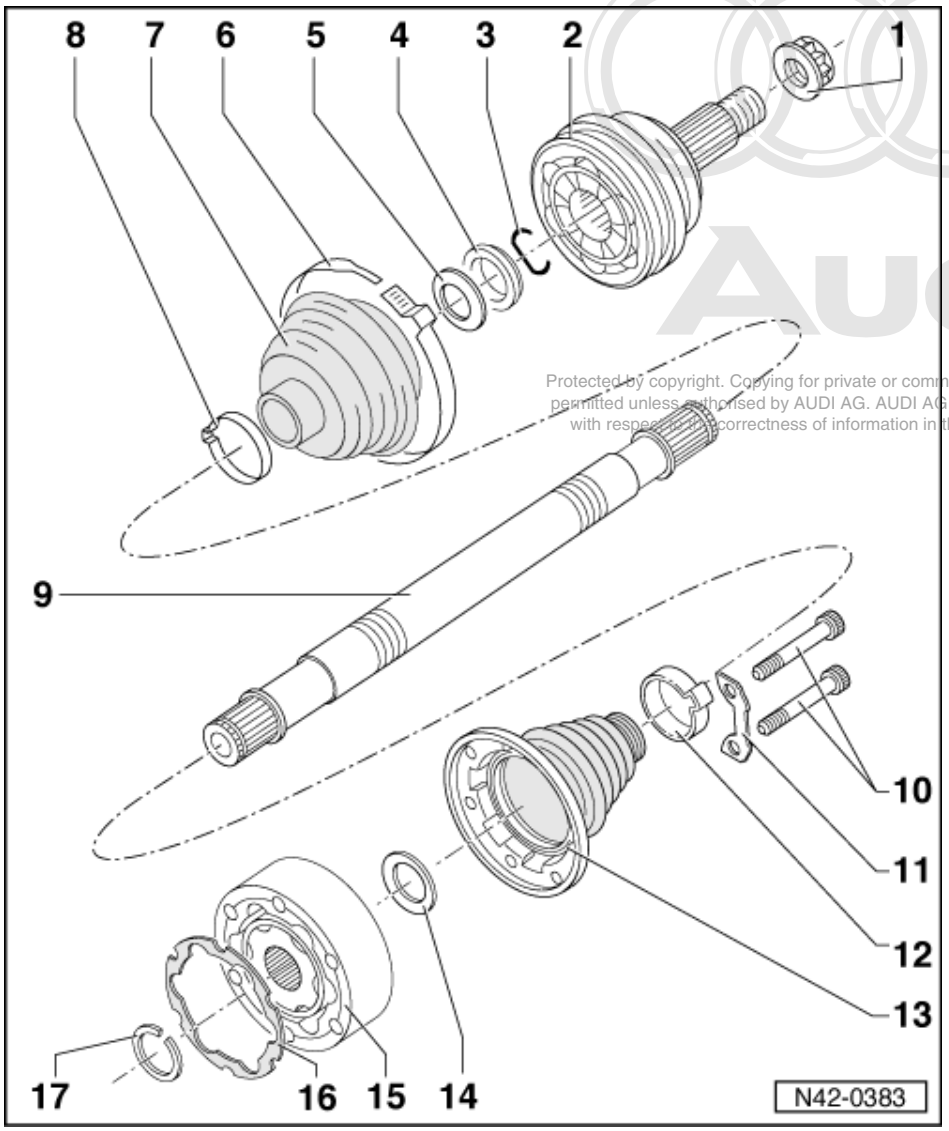
1 Twelve-point nut
- Self-locking
- Always replace after removing
- Unfastening and tightening => Page 250
- Remove any paint remnants and/or corrosion in thread of outer joint before screwing on nut

2 Outer constant velocity joint
- Replace only as complete assembly
- Removing => Fig. 2
- Checking =>Page 261
- Greasing =>Table, Page 253
- Installing:

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

3 Circlip
- Replace
- Insert in shaft groove

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4 **Spacer ring (plastic)**
- Installation position => Fig. 5

5 **Dished washer**
- Installation position => Fig. 5

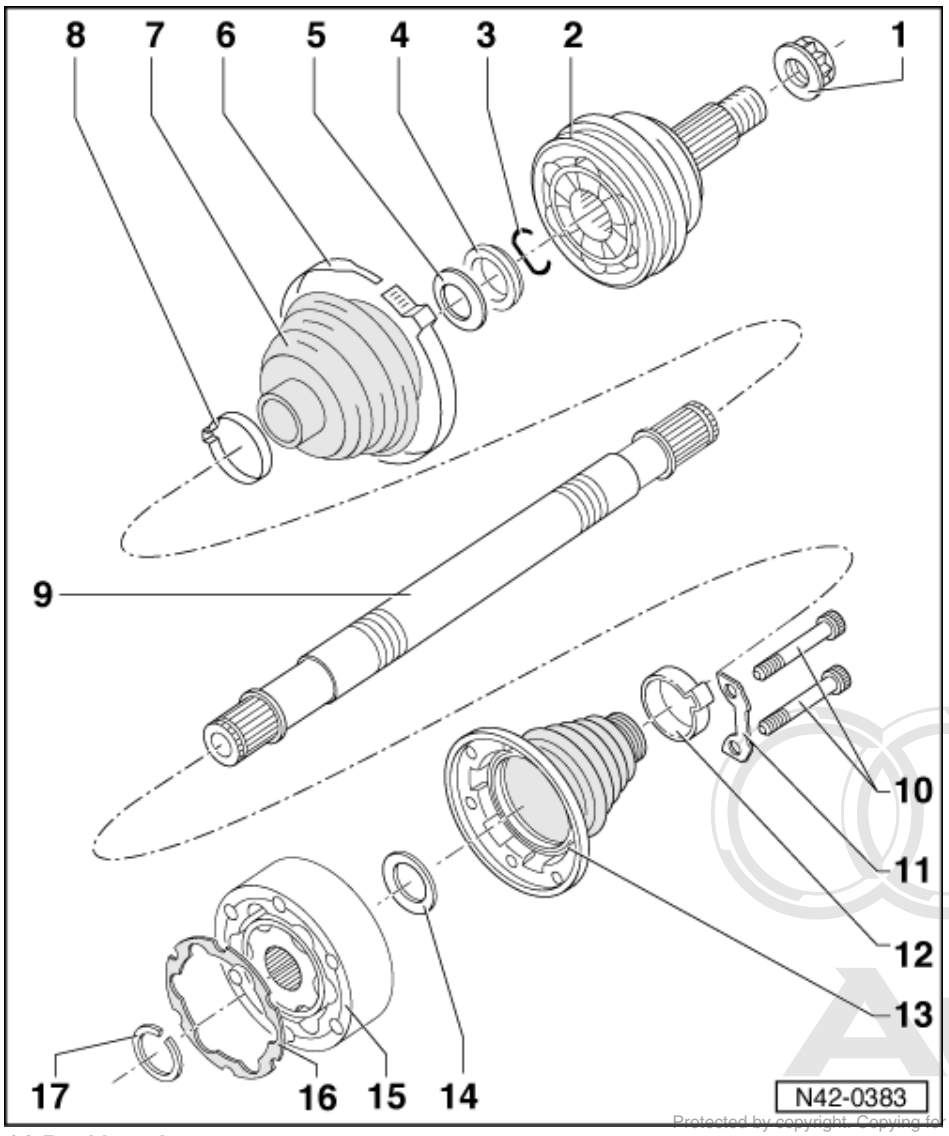
6 **Clamp**
- Replace
- Tensioning => Fig. 7

7 **Boot**
- Check for cracks and abrasion

8 **Clamp**
- Replace
- Tensioning => Fig. 7

9 **Drive shaft (solid shaft)**

10 **Multi-point socket-head bolt**
- Pre-tightening torque: 10 Nm
- Tightening torque: 40 Nm



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11 Packing plate

12 Clamp

- Replace
- Tensioning => Fig. 8

13 Boot

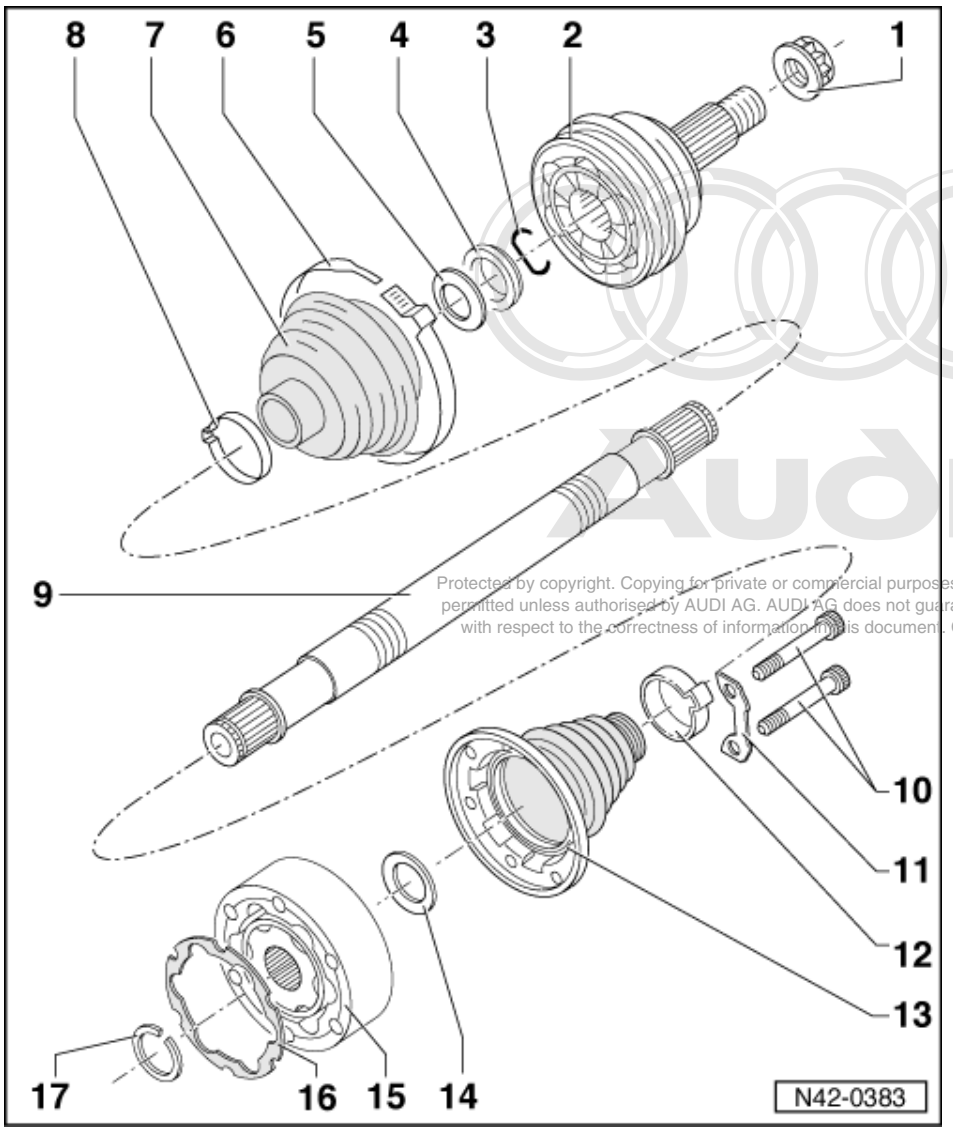
- Check for cracks and abrasion
- Drive off with mandrel

14 Dished washer

- Installation position => Fig. 6

15 Inner constant velocity joint

- Replace only as complete assembly
- Pressing off => Fig. 3
- Pressing on => Fig. 4
- Greasing =>Table, Page 253
- Checking =>Page 262



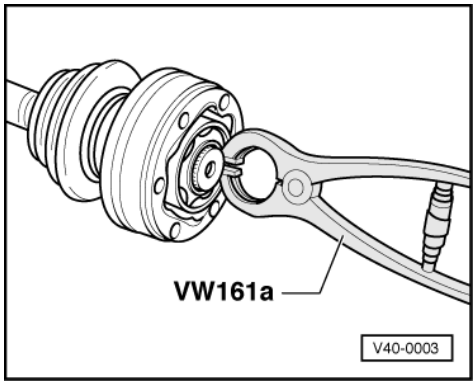
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16 Gasket

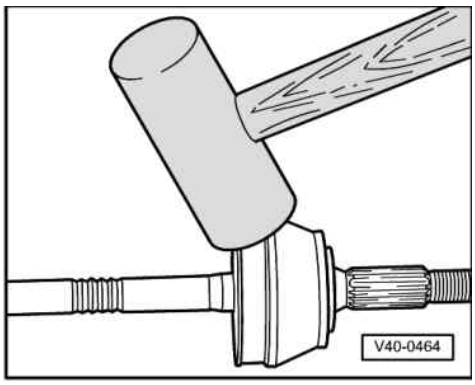
- Replace
- Pull off backing and bond self-adhesive side of gasket into joint

17 Circlip

- Replace
- Removing and installing with VW 161 A =>Fig. 1

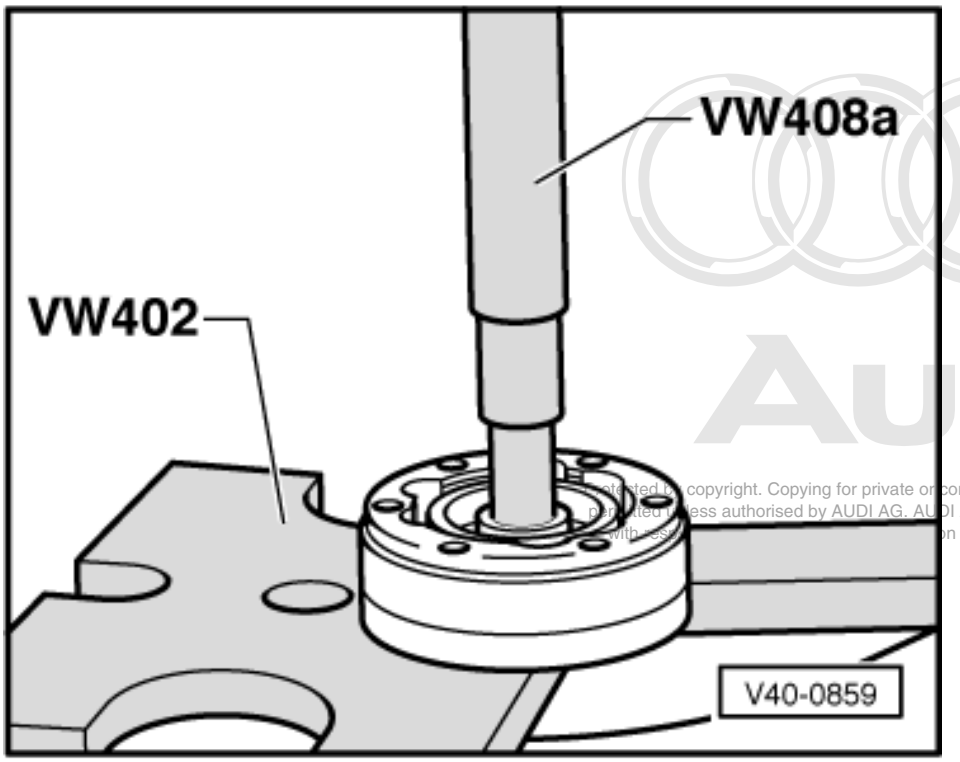


-> Fig.1 Removing and installing circlip



-> Fig.2 Removing outer constant velocity joint

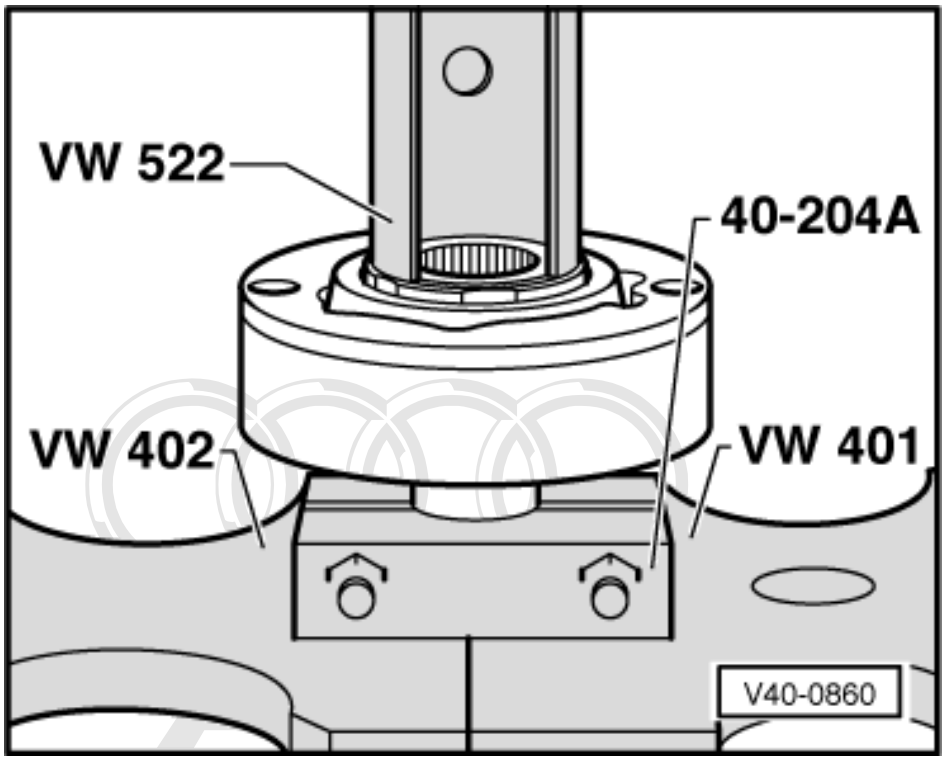
- Tap firmly with light alloy hammer to drive constant velocity joint off drive shaft.



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-> Fig.3 Pressing off inner constant velocity joint

- Use mandrel to drive off boot.
- Support ball hub when pressing off.



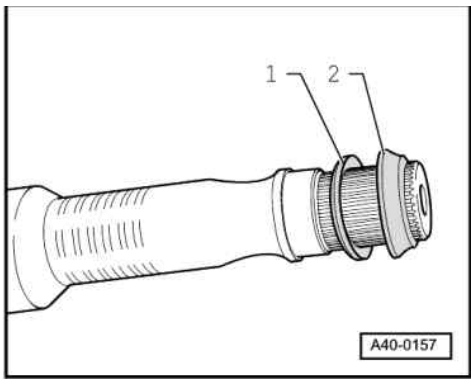
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-> Fig.4 Pressing on inner constant velocity joint

- Press on joint as far as it will go.
- Fit circlip.

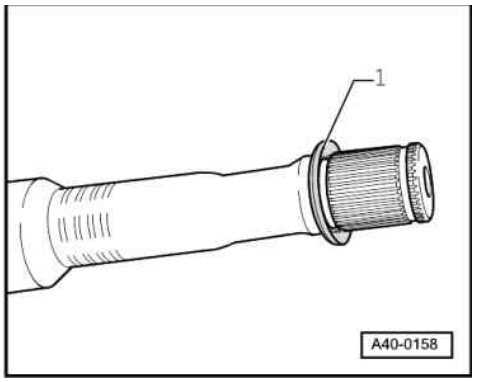
Note:

Chamfer at ID of ball hub (splines) must face contact collar of drive shaft.



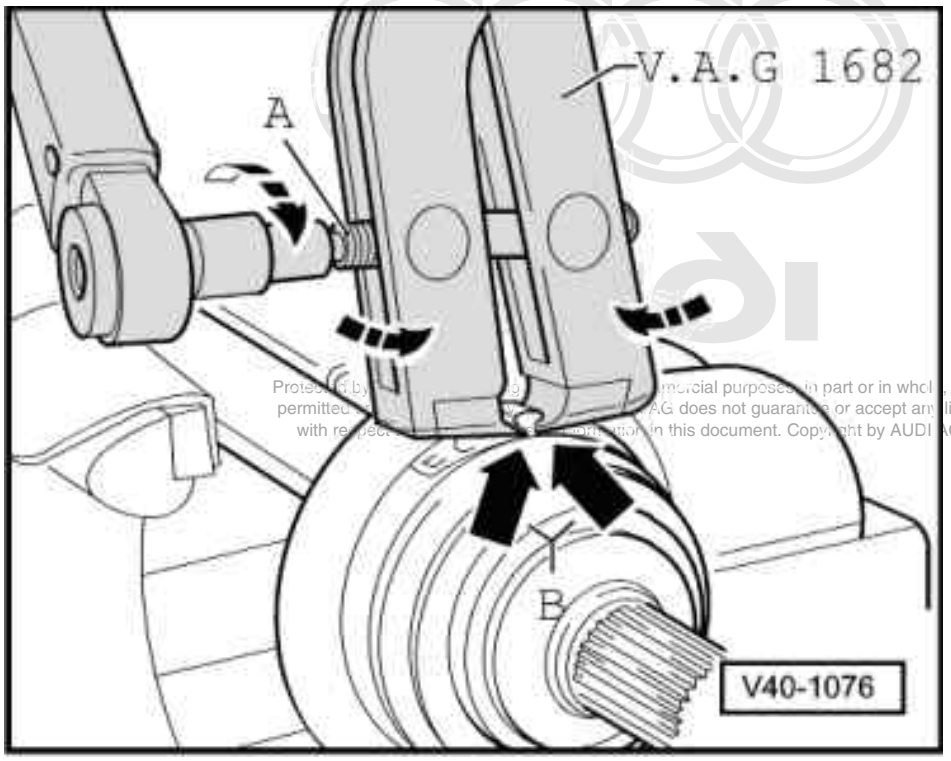
-> Fig.5 Installation position of spacer ring and dished washer at outer joint

1 - Dished washer
2 - Spacer ring (plastic)



-> Fig.6 Installation position of dished washer at inner joint

1 - Dished washer



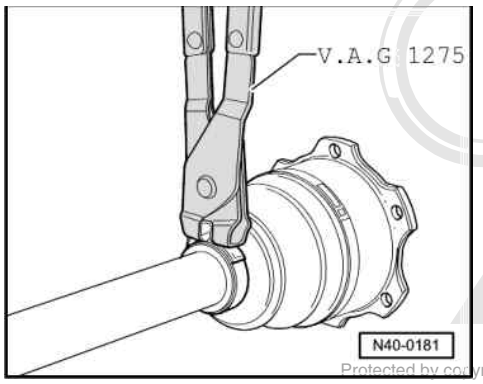
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-> Fig.7 Tensioning stainless-steel clamps for Hytrel boots

- Apply pliers V. A.G 1682 as shown. Make sure jaws of pliers make contact with corners (arrows B) of hose clamp.
- Tension hose clamp by turning spindle -A- with torque wrench (take care not to tilt pliers).
  - Tightening torque: 20 Nm

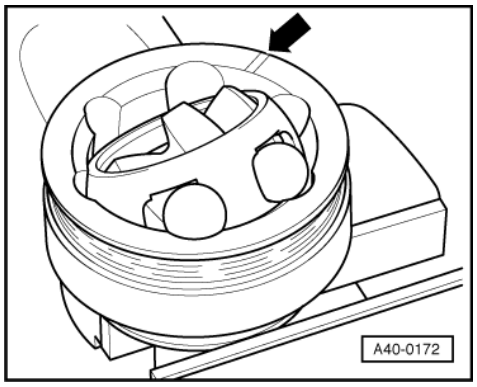
Notes:

- Make sure thread of spindle on pliers moves freely. Lubricate with MoS2 grease if necessary.
- If stiff, e.g. due to dirt on thread, required clamp tensioning force will not be attained with specified tightening torque.



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-> Fig.8 Tensioning clamp for rubber boot

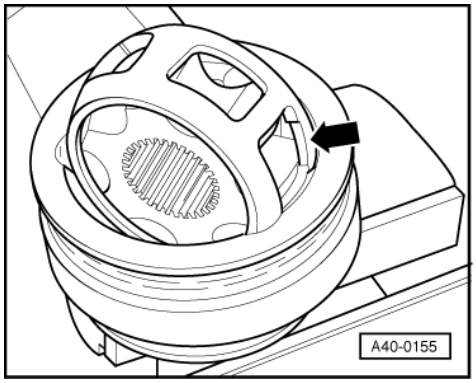


Checking outer constant velocity joint

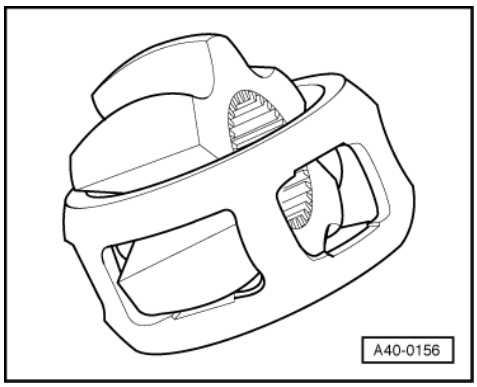
The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

Removing

- -> Use electric scriber or whetstone to mark position of ball hub with respect to ball cage and housing before dismantling -arrow-.
- Swivel ball hub and ball cage and take out balls one after the other.



- -> Turn cage until two cage openings (arrow) are in contact with joint housing.
- Lift out cage with hub.



- -> Swivel one hub segment into cage opening.
- Tip hub out of cage.

Notes:

- The 6 balls for each joint are of one tolerance group. Check stub axle, hub, cage and balls for pitting and signs of seizure.
- Excessive backlash in joint becomes apparent from load change jolts; joint is then to be replaced.
- Smooth areas and running marks on balls do not necessitate joint replacement.

Installing

Install in reverse order, paying attention to the following:

- Press 40 g of drive shaft grease from repair set into joint from both sides.
- Insert cage with hub in joint housing.

Note:

Cage must be inserted in correct position.

- Consecutively press in opposite balls, taking care to re-establish previous position of ball hub with respect to ball cage and joint housing.
- Insert new circlip in shaft.
- Distribute 50 g of drive shaft grease from repair in boot.

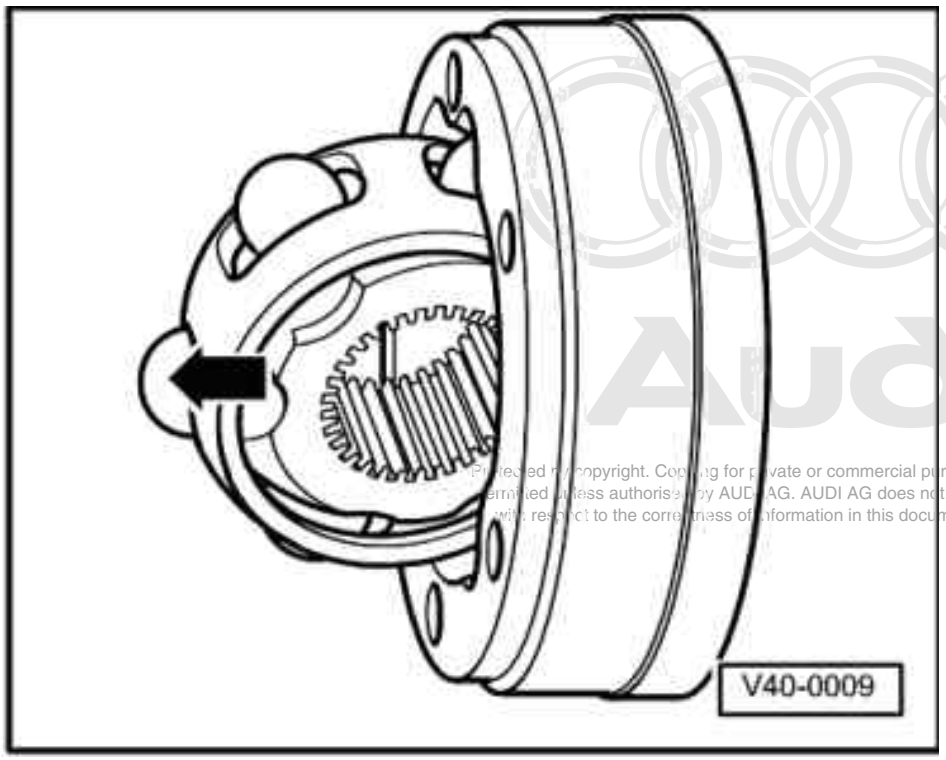
Checking inner constant velocity joint

The joint must be dismantled for replacing grease in the event of severe contamination or if ball contact surfaces are to be checked for wear and damage.

Note:

Ball hub and joint element are paired. Mark respective positions with a waterproof felt-tip pen prior to removal.

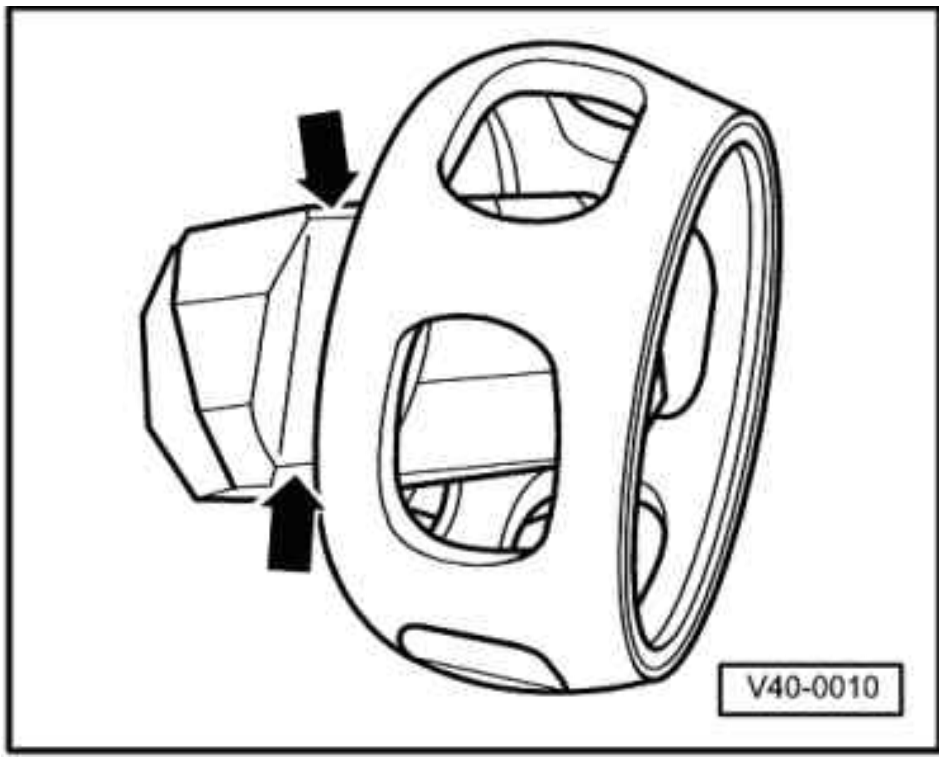
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Removing

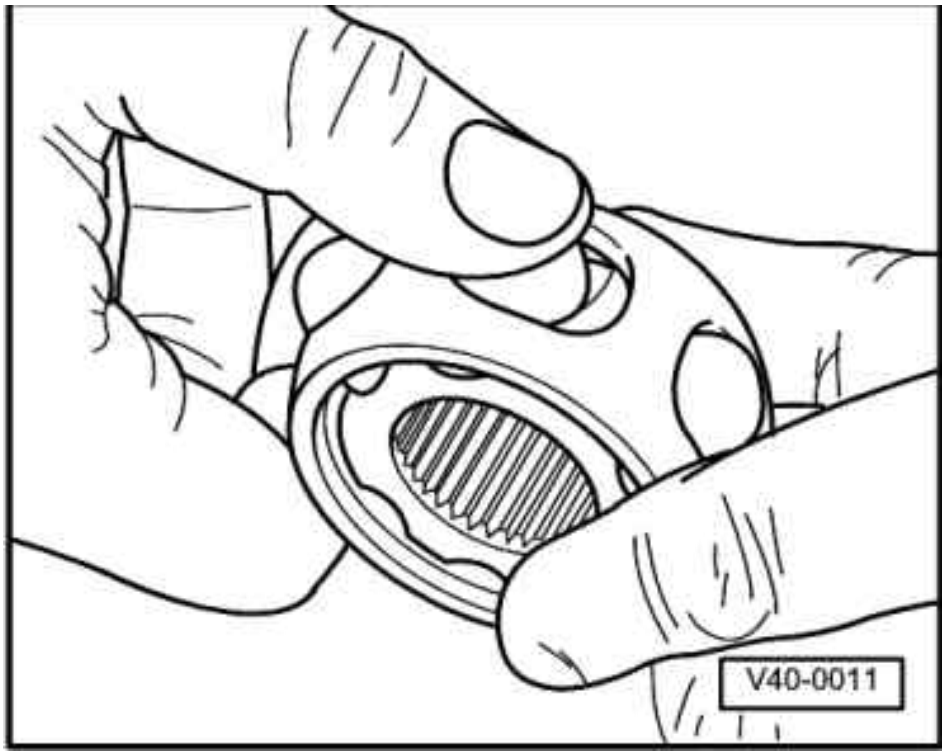
- -> Swivel ball hub and ball cage.
- Press out joint element in direction of arrow.
- Press balls out of cage.



- -> Tip ball hub out of ball cage via ball raceway -arrows-.
- Check joint element, ball hub, ball cage and balls for pitting and signs of seizure.

Note:

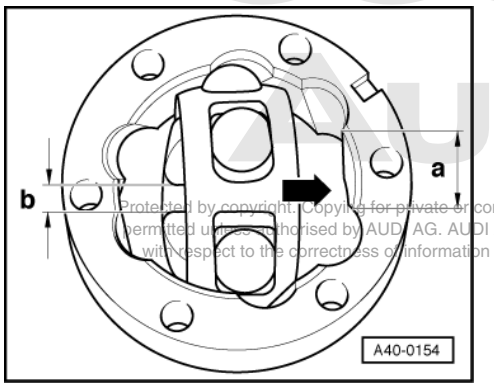
Excessive backlash in joint becomes apparent from load change jolts. Joint is then to be replaced. Smooth areas and running marks on balls do not necessitate joint replacement.



Installing

Install in reverse order, paying attention to the following:

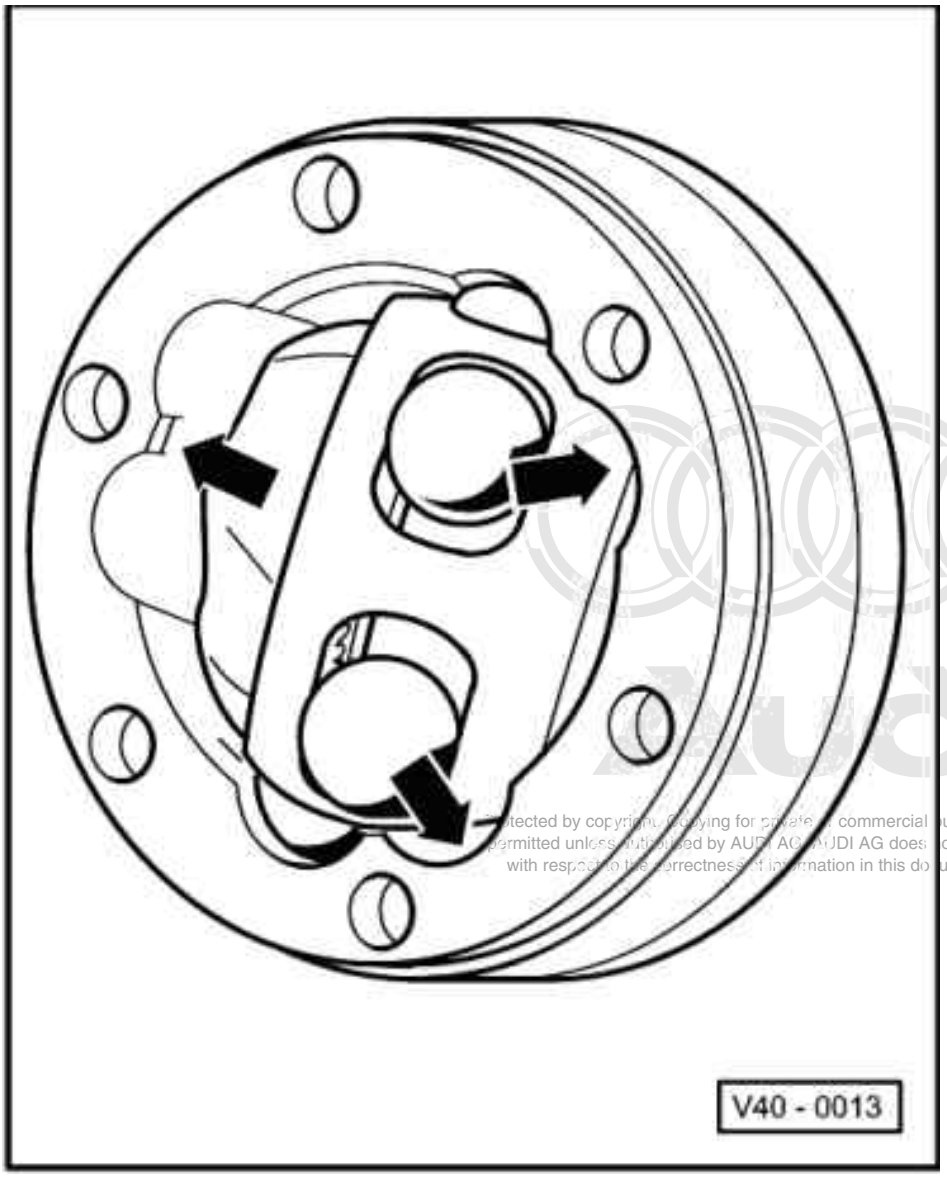
- -> Insert ball hub in ball cage via the two chamfers. Installation position is arbitrary. Press balls into cage.
- Insert hub with cage and balls in upright position in joint element.



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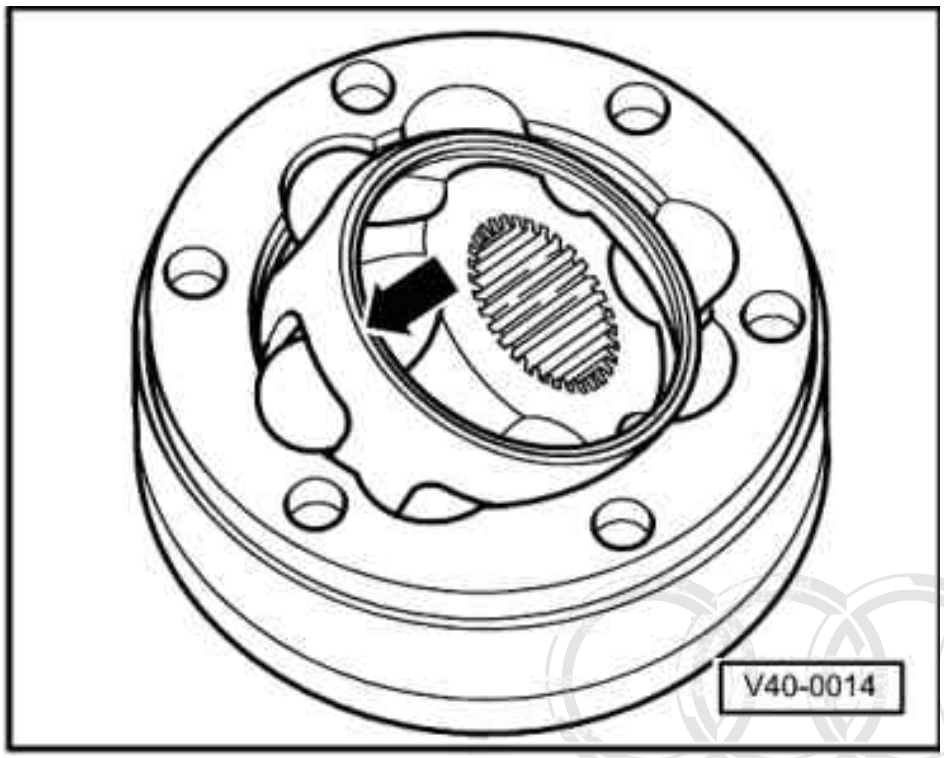
Notes:

- -> On insertion, make sure that broad gap -a- at joint element coincides with narrow gap -b- at hub after swivelling in.
- Chamfer at ID of ball hub (splines) must face large diameter of joint element.
- On installation, also use felt-tip pen mark made on removal as a guide.



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- -> Swivel in ball hub; to do so swivel hub out of cage (arrows) until the spacing of the balls corresponds to that of the raceways.



- -> Swivel in hub with balls by pressing firmly on cage (arrow).

Checking operation of constant velocity joint

Constant velocity joint has been correctly assembled if ball hub can be pushed back and forth by hand over entire length compensation range.

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44 - Wheels, Tyres, Wheel alignment

1 - Wheels and tyres

1.1 - Wheels and tyres

The valid wheel/tyre combinations can be found in

=> Fault-finding binder; Wheels/tyres; Section 2

General

To ensure vehicle safety, tyres are not to be renewed individually, but rather at least on an axle basis.

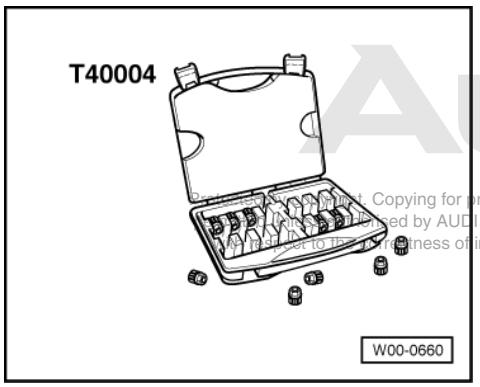
The tyres with the deeper tread should always be fitted to the front wheels.

It is advisable to use tyres of the same make, design and tread type on all wheels.

Always replace rubber valve when renewing disc wheel or tyre.

Tyres are to be fitted with DOT mark facing outside of wheel; applies to left side of vehicle only in the case of tyres with directional tread pattern.

A wheel/tyre combination for the right side of the vehicle is to be fitted as spare wheel in the case of tyres with directional tread pattern.

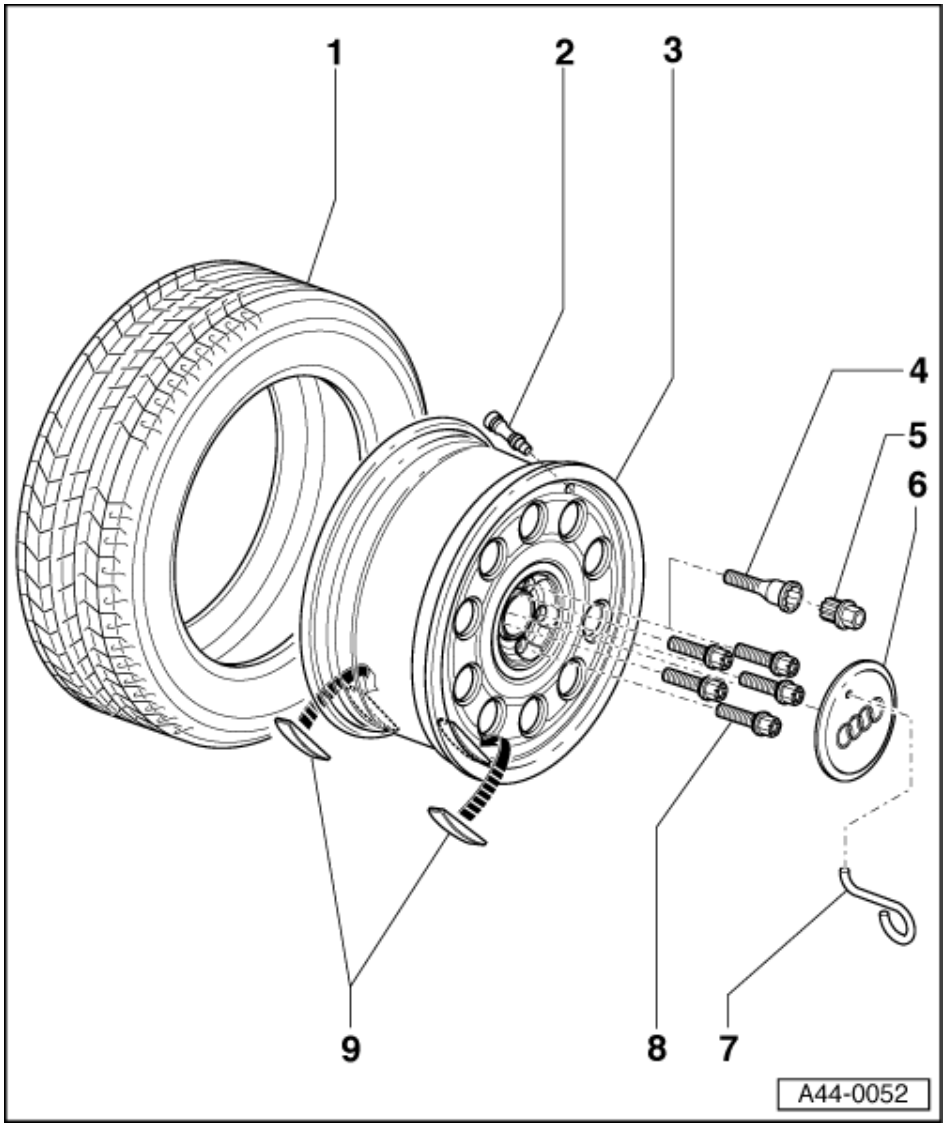


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Special tools and workshop equipment required

- Master set for wheel bolts T40004

1.2 - Light alloy wheel with trim cap



1 Tyre

2 Valve
- Replace
- Different versions; assignment

=> Parts List

3 Rim
- Different versions; assignment

=> Parts List

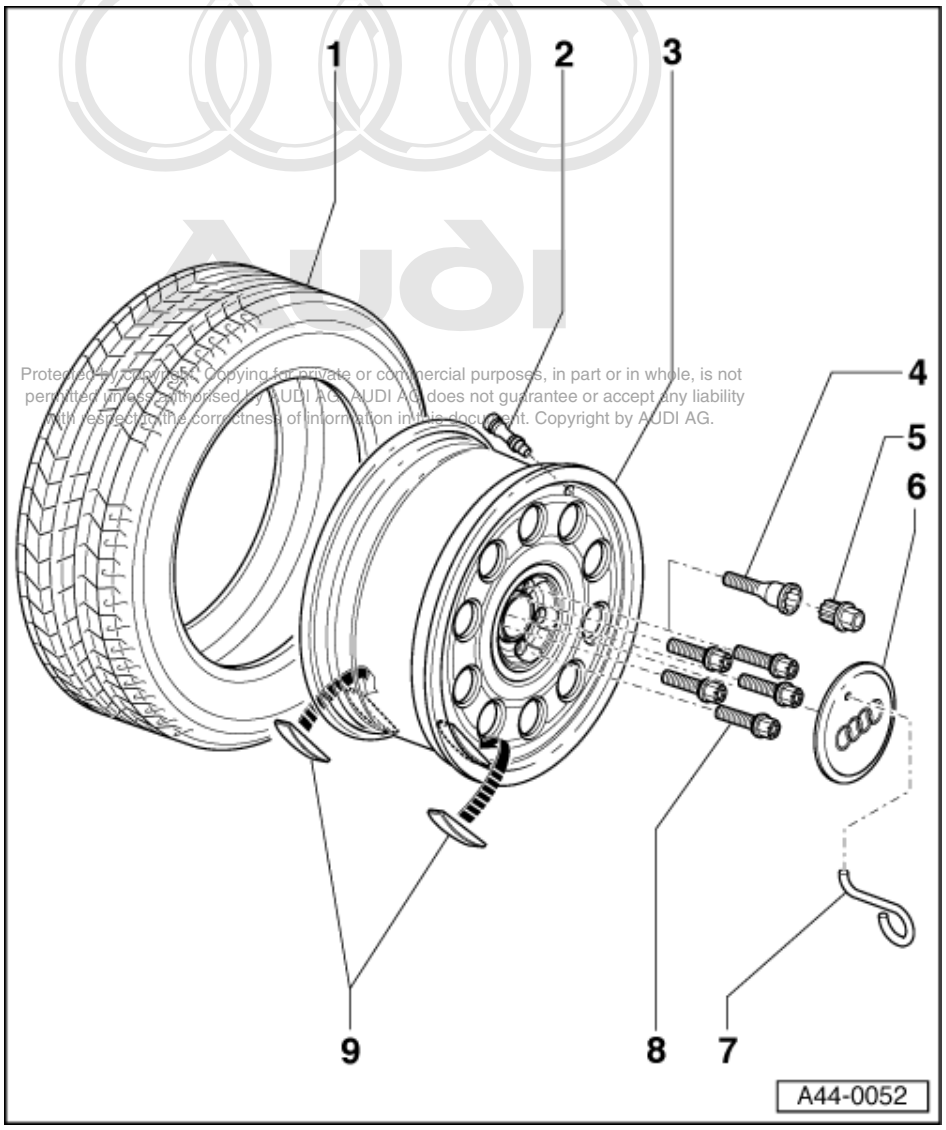
- Hole circle ø 100 mm

4 Anti-theft wheel bolt
- Tightening method and torque
  => Page 273

5 Adapter for anti-theft wheel bolt

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- Master set for wheel bolts T40004



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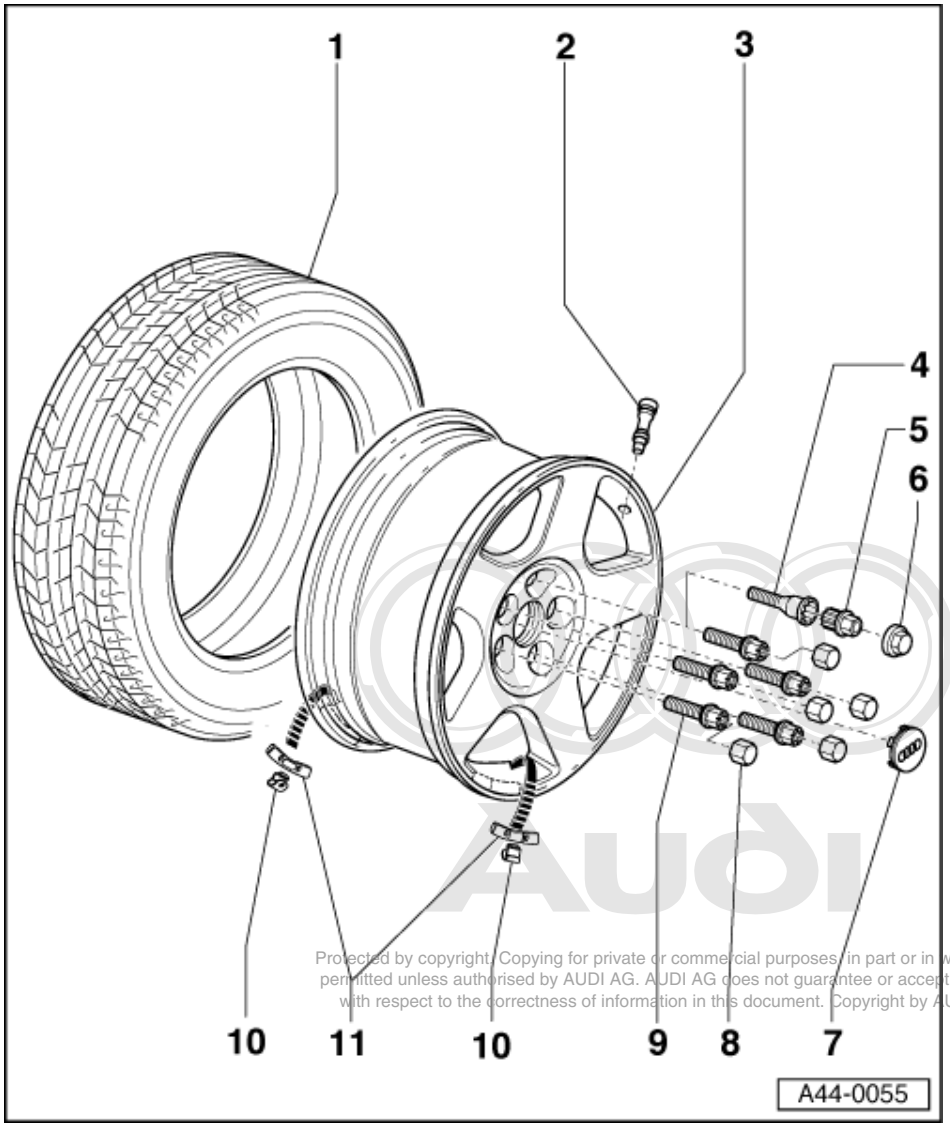
6 Trim cap
- With hole for puller

7 Puller
- For removing trim cap; contained in vehicle tool kit

8 Wheel bolt
- Tightening method and torque
  => Page 273

9 Balancing weights
- Max. 60 g per rim flange permitted

1.3 - Light alloy wheel with hub cap



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1 **Tyre**

2 **Valve**

- Replace
- Different versions; assignment

=> Parts List

3 **Rim**

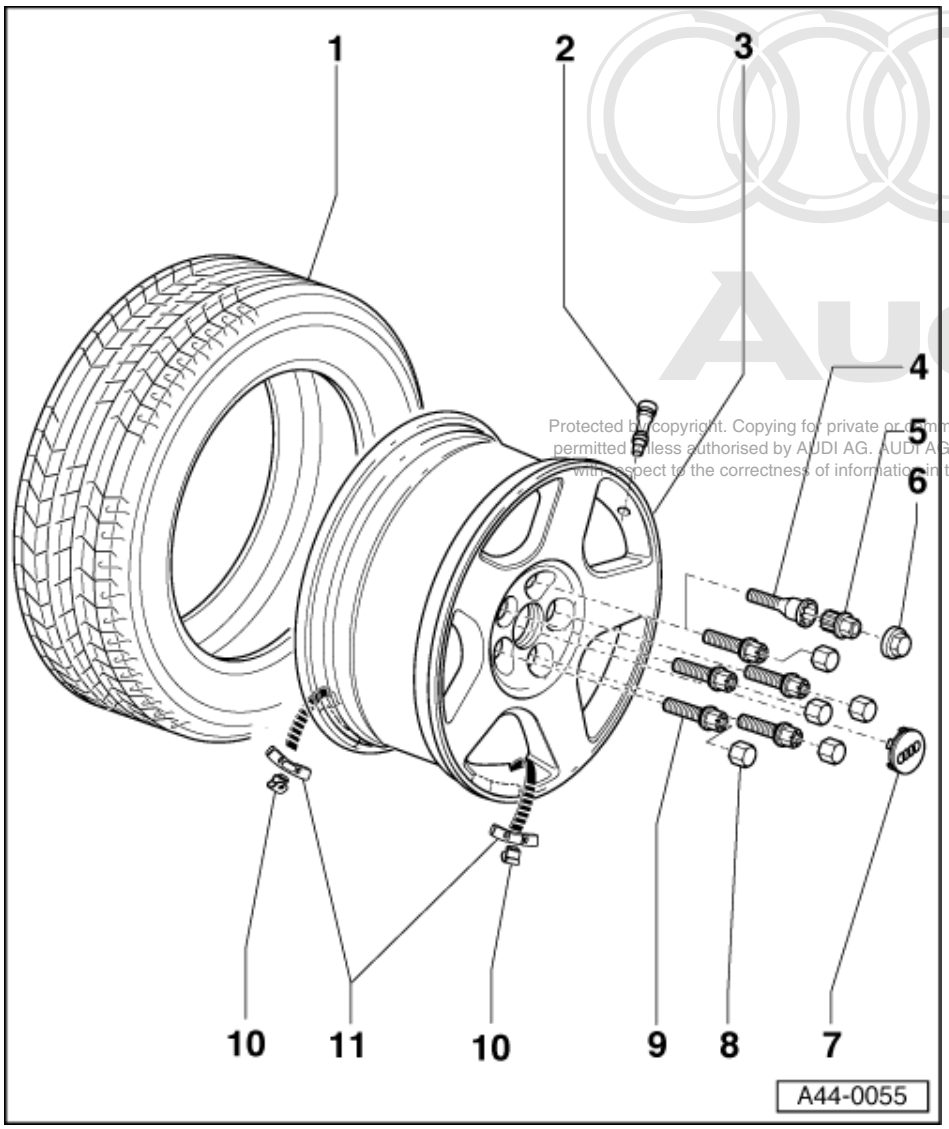
- Hole circle ø 100 mm

4 **Anti-theft wheel bolt**

- Tightening method and torque
  => Page 273

5 **Adapter for anti-theft wheel bolt**

- Master set for wheel bolts T40004



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6 Trim cap
- Attach to anti-theft wheel bolt

7 Hub cap

8 Trim cap
- Attach to wheel bolt

9 Wheel bolt
- Tightening method and torque
  => Page 273

10 Retaining spring for balancing weights

11 Balancing weights
- Max. 60 g per rim flange permitted

1.4 - Balancing wheels on vehicle

- Switch off ignition.

Notes:

- Wheel imbalance produces front-end judder and causes steering wheel vibration.

=> Fault-finding binder; Wheels/tyres; Section 1

- When performing balancing work, position vehicle on sensor platforms (both axles for 4WD, front axle for FWD).
- Pay attention to operating instructions of balancing equipment manufacturer.

1.5 - Wheel change/wheel fitting instructions

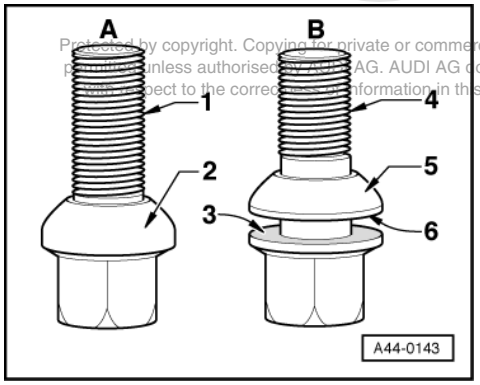
Attention:
Firm fit of wheel bolts and wheels can only be guaranteed by adhering to the tests/instructions indicated below.

The work relating to the following tests/instructions must be performed with wheel (rim) removed.

- Check whether collars of rims and contact surfaces at brake disc/wheel (rim) as well as brake disc/wheel hub are free from corrosion and dirt.
  Remove any oil, grease and corrosion and re-establish corrosion protection by applying wax spray D 322 000 A2.
- Check whether centring hole of wheel (rim) and centring element of wheel hub are free from corrosion and dirt.
  Remove any oil, grease and corrosion and re-establish corrosion protection by applying wax spray D 322 000 A2.
- If rust drops between brake disc and wheel hub when dismantling, this must be removed and the contact surfaces cleaned.

- Check that wheel bolts and wheel hub threads are clean. It must be easy to screw in the full thread length of the wheel bolts when fitting the wheel.
- Use a wire brush, for example, to clean dirty wheel bolts.
  Severely corroded and/or damaged wheel bolts are to be replaced.

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- If slightly corroded wheel bolts are re-used, they are to be cleaned in the area of the collar and thread and the contact surfaces greased as follows with Optimol TA paste, part no. G 052 109 A2.

  -> A - One-piece wheel bolt
  - Apply thin coat of grease to thread area -1- and collar -2-
    B - Two-piece wheel bolt
  - Apply thin coat of grease to thread area -4- as well as between bolt head resting surface -3- and collar ring -6-
  - Do not apply grease to surface -5- of collar which rests on rim

Note:

Exclusive use is to be made of Optimol TA paste, part no. G 052 109 A2. Paste must not be allowed to come into contact with brake system components.

- Make sure brake disc hole is aligned with hub thread. Wheel bolt thread must not make contact with brake disc hole.

Fitting wheels

- Bolt on all wheels as follows:
- Screw in wheel bolts evenly by hand.
- Tighten wheel bolts diagonally with vehicle still jacked up.
  - Tightening torque: 50 Nm
- Lower vehicle onto ground and diagonally finish-tighten wheel bolts.
  - Tightening torque: 120 Nm

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2 - Wheel alignment

2.1 - Wheel alignment

Wheel alignment is always to be performed with equipment released for use by VW/AUDI.

Wheel alignment always includes both front and rear axle.

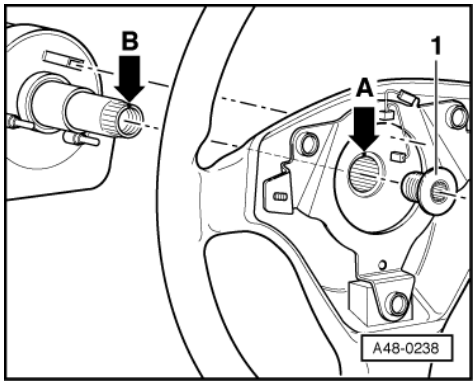
Proper vehicle performance is otherwise not guaranteed.

Notes:

- It is not appropriate to carry out wheel alignment before the vehicle has been driven for between 1000 and 2000 km, as the coil springs must be allowed to fully settle.
- Always attempt to come as close as possible to the respective specifications when performing adjustment work.
- Vehicle judder may also be caused by excessive residual imbalance and/or radial runout of wheels.

Attention:
On completion of front axle adjustment work, zero position compensation must be performed for steering angle sender
-G85 on vehicles with ESP following wheel alignment.=>Running Gear, Self-diagnosis; Repair Group 01

Failure to allow for installation position of rear axle and thus vehicle setting could result in steering wheel not being straight.



-> Steering wheel and steering column are marked.

This position should not be altered.

A - Line on steering wheel
B - Centre punch mark on steering column

Otherwise centre position of rack is not guaranteed.

There is no centre punch mark on replacement steering columns.

If steering column or steering wheel is replaced, marking must be re-applied on completion of wheel alignment and test drive.

Tightening torque

Component		Nm
Steering wheel to steering column	Hexagon bolt	75 1)
	Multi-point socket head bolt	50 1)

1) Replace bolt

Wheel alignment must be performed:

In the event of running problems
Following accident damage
If axle components have been removed
If one-sided tyre wear is found

Front axle component replaced	Alignment required		Rear axle component replaced	Alignment required	
	Yes	No		Yes	No
Suspension strut		X	Gas-filled shock absorber		X
Wishbone	X		Coil spring		X
Ball joint	X		Mounting bracket	X	
Wheel bearing housing	X		Subframe 1)	X	
Track rod end	X		Wishbone 1)	X	
Steering box	X		Transverse link 1)		X
Subframe	X		Track rod 1)	X	
Anti-roll bar		X	Cross member 1)		X
			Anti-roll bar 1)		X
			Entire torsion beam axle (FWD)	X	

1) Four-wheel drive vehicles only

2.2 - Test requirements:

- Suspension, steering and steering linkage checked for impermissible play and damage
- Tread depth on one axle must not differ by more than 2 mm
- Specified tyre inflation pressure
- Sensors properly attached and adjusted; heed manufacturer's operating instructions
- Vehicle kerb weight 1)

1) Kerb weight refers to weight of vehicle when ready for use (fuel tank full, spare wheel, tool kit, jack).

- Wheel alignment platform and wheel alignment equipment/computer may start to deviate over the course of time from their original position/setting.
- Wheel alignment platform and wheel alignment equipment/computer should be calibrated at least once a year as part of maintenance work.

- Take care to treat this highly sensitive equipment carefully and conscientiously.

- If appropriate, have manufacturer of wheel alignment computer provide a course of instruction.
- Vehicle properly aligned, bounced several times and allowed to settle
- When performing wheel alignment, make sure neither sliding base nor turntable is on end stop
- Perform wheel runout compensation

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The permissible wheel runout may already cause the toe-in tolerance to be exceeded. The toe-in can then not be set correctly without performing wheel runout compensation.

2.3 - Wheel alignment specifications - Audi A3 with front-wheel drive

Applicable to all engines

Front axle	Standard running gear	Sports running gear	Heavy-duty running gear
Individual toe (not pressed)	0' ±5'	0' ±5'	0' ±5'
Overall toe (not pressed)	0' ±10'	0' ±10'	0' ±10'
Camber (with wheels straight ahead) 1)	-30' ±30'	-33' ±30'	-16' ±30'
Max. perm. difference between the two sides	max. 30'	max. 30'	max. 30'
Toe-out on turns with 20°steering angle2)	1° 30' ±20'	1° 31' ±20'	1° 27' ±20'
Caster (not adjustable)	7° 40'	7° 50'	7° 15'
Max. perm. difference between the two sides	max. 30'	max. 30'	max. 30'
Max. steering angle at inner wheel	40°	39°	40°

1) Camber cannot be adjusted. It can only be corrected slightly by moving subframe. Adjustment range 10'... 15'.

2) Angle of outer wheel is this much less. It may also be given as a negative figure by wheel alignment computers of certain manufacturers.

Rear axle	Standard running gear	Sports running gear	Heavy-duty running gear
Overall toe (not adjustable)	20' ±10'	25' ±10'	10'+ 10'/-7'
Max. perm. mis-alignment 3)	max. 20'	max. 20'	max. 20'
Camber (not adjustable)	-1° 27' ± 20'	-1° 27' ± 20'	-1° 27' ± 20'
Max. perm. difference between the two sides	max. 30'	max. 30'	max. 30'

3) Slight correction can be achieved by moving rear axle beam.

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2.4 - Wheel alignment specifications - Audi A3 with four-wheel drive

Applicable to all engines

Front axle	Standard running gear	Sports running gear	Heavy-duty running gear
Individual toe (not pressed)	0' ±5'	0' ±5'	0' ±5'
Overall toe (not pressed)	0' ±10'	0' ±10'	0' ±10'
Camber (with wheels straight ahead) 1)	-30' ±30'	-33' ±30'	-16' ±30'
Max. perm. difference between the two sides	max. 30'	max. 30'	max. 30'
Toe-out on turns with 20°steering angle2)	1° 30' ±20'	1° 31' ±20'	1° 27' ±20'

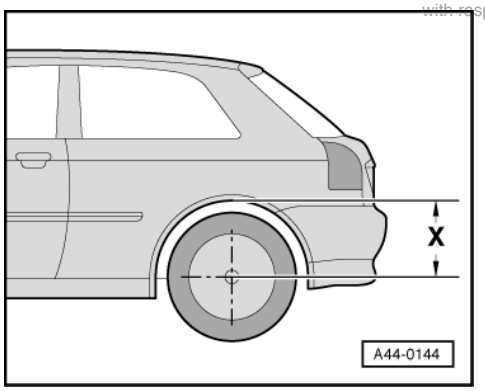
Front axle	Standard running gear	Sports running gear	Heavy-duty running gear
Caster (not adjustable)	7° 40'	7° 50'	7° 15'
Max. perm. difference between the two sides	max. 30'	max. 30'	max. 30'
Max. steering angle at inner wheel	40°	39°	40°

1) Camber cannot be adjusted. It can only be corrected slightly by moving subframe. Adjustment range 10'... 15'.

2) Angle of outer wheel is this much less. It may also be given as a negative figure by wheel alignment computers of certain manufacturers.

Rear axle	Standard running gear	Sports running gear	Heavy-duty running gear
Overall toe	15'+ 15'/-10'	15'+ 15'/-10'	15' ±10'
Permissible mis-alignment with respect to longitudinal axis of vehicle	max. 20'	max. 20'	max. 20'
Camber	=> Table, Page 276		
Permissible difference between the two sides	max. 20°	max. 20°	max. 20°

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Rear axle camber is governed by height dimension between centre of wheel and bottom edge of wheel housing on body.

- -> Prior to wheel alignment, determine height dimension "x" between centre of wheel and bottom edge of wheel housing on body.

Rear axle camber values as a function of height dimension between centre of wheel and bottom edge of wheel housing on body

Standard running gear		Sports running gear		Heavy-duty running gear	
Height x	Camber value	Height x	Camber value	Height x	Camber value
355 mm	-1° 18'	340 mm	-1° 46'	380 mm	-1° 18'
360 mm	-1° 08'	345 mm	-1° 36'	385 mm	-1° 08'
365 mm	-58'	350 mm	-1° 26'	390 mm	-58'
370 mm	-48'	355 mm	-1° 16'	395 mm	-48'
375 mm	-38'	360 mm	-1° 06'	400 mm	-38'
379 mm	**-30'**	**364 mm**	**-58'**	**404 mm**	**-30'**
380 mm	-28'	365 mm	-56'	405 mm	-28'
385 mm	-18'	370 mm	-46'	410 mm	-18'

Standard running gear		Sports running gear		Heavy-duty running gear	
Height x	Camber value	Height x	Camber value	Height x	Camber value
390 mm	-8'	375 mm	-36'	415 mm	-8'
395 mm	2'	380 mm	-26'	420 mm	2'
400 mm	12'	385 mm	-16'	425 mm	12'
405 mm	22'	390 mm	-6'	430 mm	22'
410 mm	32'	395 mm	4'	435 mm	32'
415 mm	42'	400 mm	14'	440 mm	42'

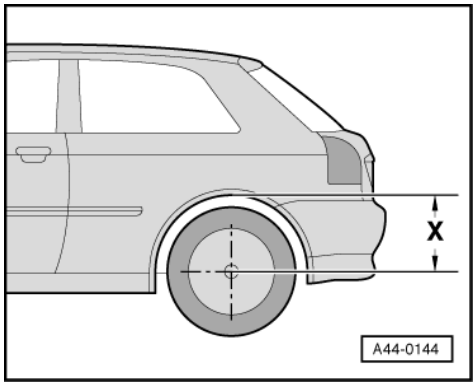
2.5 - Wheel alignment specifications - Audi S3

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Front axle	Standard running gear	Sports running gear
Individual toe (not pressed) check value	4' ± 3' 30"	4' ± 3' 30"
Individual toe (not pressed) setting	4' ± 2'	4' ± 2'
Overall toe (not pressed)	8' ± 7'	8' ± 7'
Camber (with wheels straight ahead) Max. perm. difference between the two sides	-45' ± 30' max. 30'	-58' ± 30' max. 30'
Toe-out on turns with 20° steering angle 1)	-1°31' ± 20'	-1°31' ± 20'
Caster (not adjustable) Max. perm. difference between the two sides	7° 58' max. 30'	8° 15' max. 30'
Max. steering angle at inner wheel	37°	37°

1) Angle of outer wheel is this much less. It may also be given as a negative figure by wheel alignment computers of certain manufacturers.

Rear axle	Standard running gear	Sports running gear
Overall toe	15'+ 15'/-10'	15'+ 15'/-10'
Permissible mis-alignment with respect to longitudinal axis of vehicle	max. 20'	max. 20'
Camber	=> Table, Page 278	
Max. perm. difference between the two sides	max. 20'	max. 20'



Rear axle camber is governed by height dimension between centre of wheel and bottom edge of wheel housing on body.

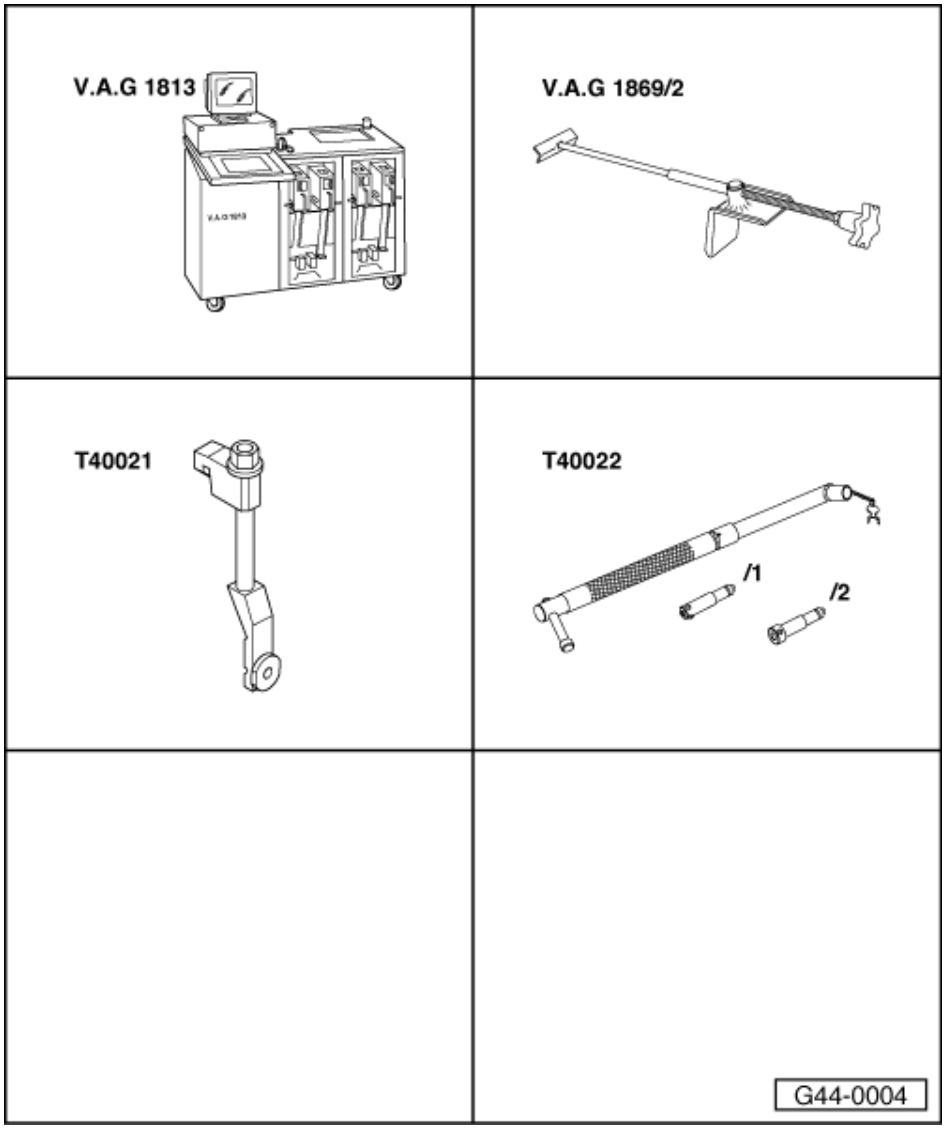
- -> Prior to wheel alignment, determine height dimension "x" between centre of wheel and bottom edge of wheel housing on body.

Rear axle camber values as a function of height dimension between centre of wheel and bottom edge of wheel housing on body

Standard running gear		Sports running gear	
Height	Camber value	Height	Camber value
340 mm	-2° 17'		
345 mm	-2° 07'		
350 mm	-1° 57'		
355 mm	-1° 47'		
360 mm	-1° 37'		
363.5 mm	**-1° 30'**	**340 mm**	**-2° 08'**
365 mm	-1° 27'	350 mm	-1° 55'
370 mm	-1° 17'		
375 mm	-1° 07'		
380 mm	-57'		
385 mm	-47'		
390 mm	-37		
395 mm	-27'		
400 mm	-17'		

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2.6 - Measurement procedure



Special tools and workshop equipment required

- Wheel alignment computer, e.g. V.A.G 1813
- Brake pedal depressor V.A.G 1869/2
- Special tool T40021
- Special tool T40022

Summary of sequence of operations for wheel alignment

Note:

Wheel alignment is only to be performed at vehicle kerb weight

=> Page 274 .

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Always keep to the following sequence:

- Check and if necessary balance out/adjust camber at front axle
- Audi A3 => Page 280
- Audi S3 => Page 281

- Check and if necessary adjust camber at rear axle
- FWD (not adjustable) => Page 282
- 4WD => Page 282
- Check and if necessary balance out/adjust toe at rear axle
- FWD (not adjustable) => Page 283
- 4WD => Page 284
- Check and if necessary adjust toe at front axle at kerb weight

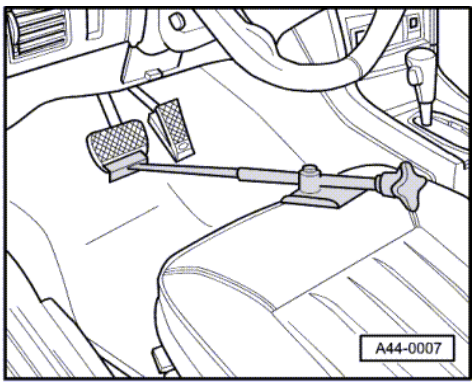
=> Page 285

5 - On completion of front axle adjustment work, zero position compensation must be performed for steering angle sender -G85 on vehicles with ESP

=> Running Gear, Self-diagnosis; Repair Group 01

6 - On vehicles with automatic headlight range control, adjustment must be followed by basic setting of headlight range control system

=> Electrical System, Self-diagnosis; Repair Group 01



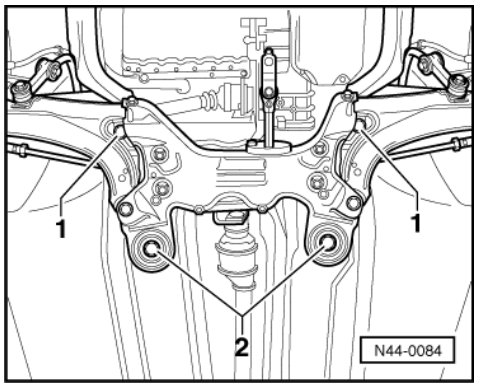
- -> Insert brake pedal depressor V.A.G 1869/2.

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2.7 - Balancing out camber at front axle - Audi A3

Camber cannot be adjusted.

It can be evenly balanced out within the tolerance range by moving the subframe.



- -> Consecutively screw out all bolts -1- and -2- and loosely screw in new ones.
- Move subframe until camber is the same on both sides.

Note:

Moving the subframe may alter the caster and caster should therefore be checked.

- Finish-tighten subframe bolts.

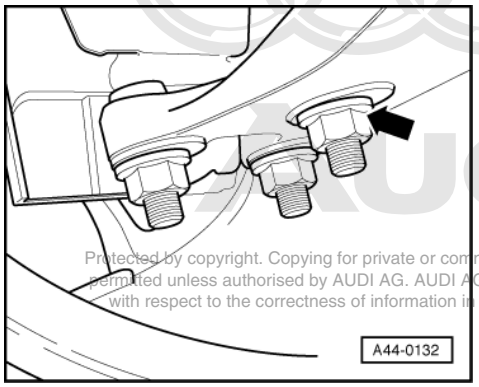
Tightening torque

Component	Nm
Subframe to body	100 + 90° 1)2)

1) 90°corresponds to quarter turn

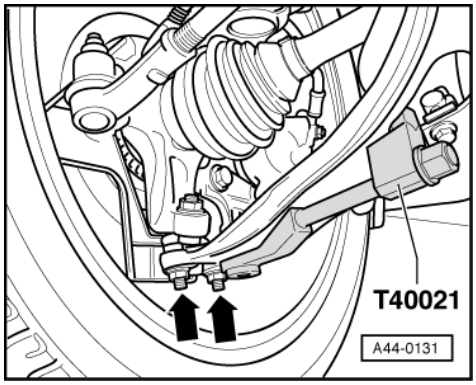
2) Replace bolts

2.8 - Adjusting camber at front axle - Audi S3



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- -> Unscrew centre nut -arrow- at ball joint.



- -> Engage special tool T 40021 in transverse link as shown.
- Screw in knurled screw at threaded pin.
- Set nut on special tool such that it makes contact.
- Unscrew nuts -arrows- and loosely screw in new ones.

- Set specified camber by turning nut on special tool.
- Tighten nuts of ball joint.

Tightening torque

Component	Nm
Ball joint to wishbone	75 1)

1) Replace nuts

2.9 - Checking rear axle camber - Front-wheel drive vehicles

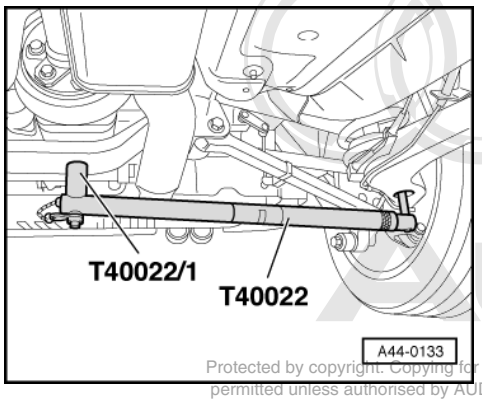
Camber can be checked but not adjusted.

If measured values are outside permitted tolerance, check axle beam for damage and replace if necessary.

2.10 - Adjusting rear axle camber - Four-wheel drive vehicles

Camber is adjusted by way of hole tolerance of transverse links.

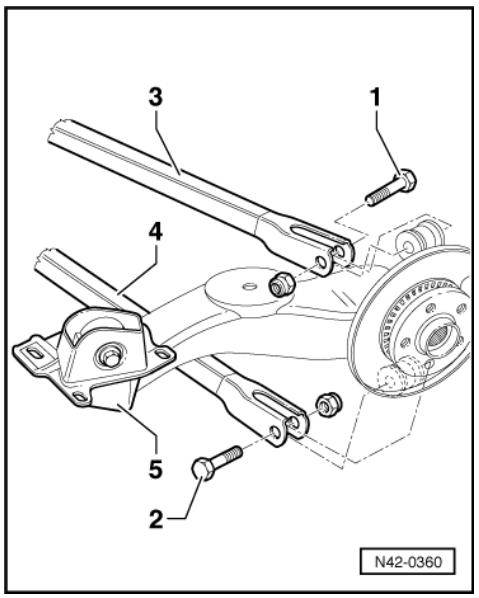
If measured values are outside permitted tolerance, check axle beam for damage and replace if necessary.



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Adjusting

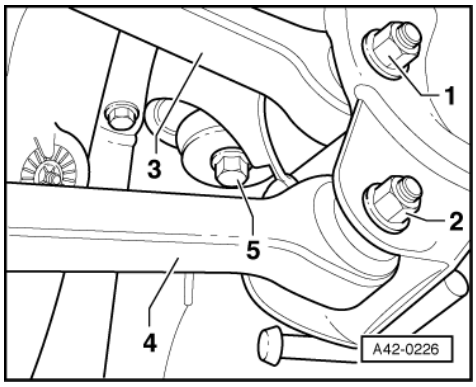
- -> Engage special tool T40022 with T40022/1 in subframe hole at trailing arm.



- -> Unscrew outer bolted joint -2- of lower transverse link.
- Loosely screw in new bolt and nut.

Note:

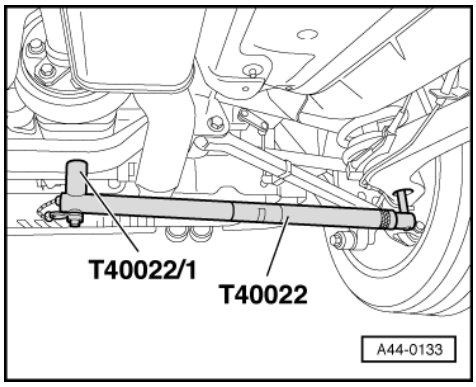
Heed installation direction of bolt.



- -> Unscrew inner bolted joint -2- of lower transverse link.
- Loosely screw in new bolt and nut.

Note:

Heed installation direction of bolt.



- -> Set specified camber by turning threaded rod on special tool T40022.
- Tighten bolted joints of lower transverse link.

Tightening torques

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Component	Nm
Transverse link to subframe	70 + 90° 1)2)
Transverse link to trailing arm	70 + 90° 1)2)

1) 90°corresponds to quarter turn

2) Replace bolts and nuts

2.11 - Balancing out rear axle toe - Front-wheel drive vehicles

Overall rear axle toe value cannot be adjusted.

The individual toe values can be balanced out by moving the rear axle.

- Slacken off bolts at mounting brackets.

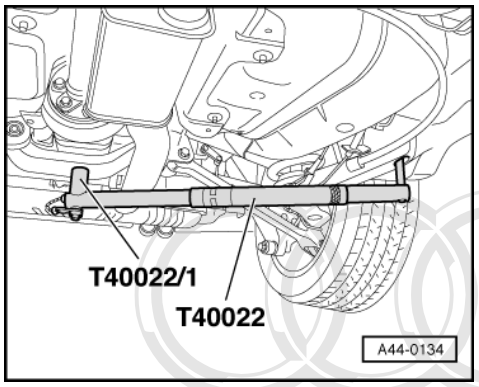
- Balance out individual toe values by moving axle beam in elongated holes of mounting brackets.

If overall toe value is outside permitted tolerance or if individual toe values cannot be balanced out, axle beam must be checked for damage and replaced if necessary.

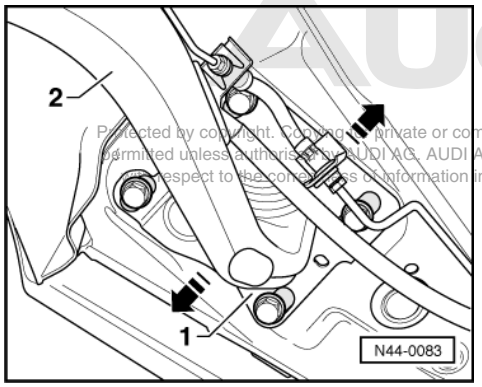
If applicable, body is also to be checked in area of rear axle mounting points/aligned and serviced.

=> Body Repairs

2.12 - Adjusting rear axle toe - Four-wheel drive



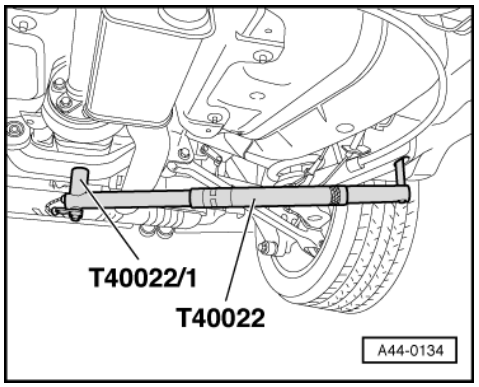
- -> Engage special tool T40022 with T40022/1 at rear subframe as well as in elongated hole at trailing arm.



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- -> Consecutively screw out all bolts of mounting bracket -1- and loosely screw in new ones.
- Move mounting bracket in transverse direction -arrows-.

2 - Trailing arm



- -> Set specified toe by turning threaded rod on special tool T40022.

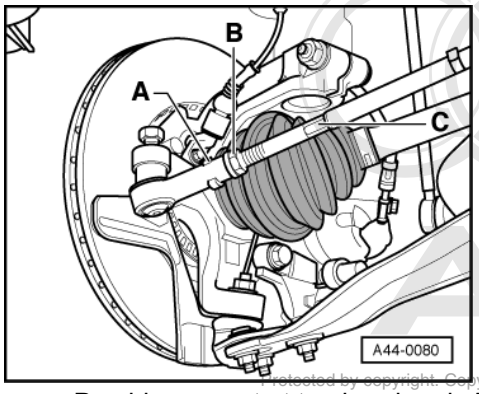
- Tighten bolts of mounting bracket.

Tightening torque

Component	Nm
Mounting bracket to body	75 1)

1) Replace bolts

2.13 - Adjusting front axle toe



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- -> Provide support at track rod end -A- with 24 mm wrench when unfastening/tightening lock nut -B-.
- Unfasten lock nut -B-.
- -> Adjust toe in each case at left and right wheel with hexagon -C-.

Notes:

- Make sure boot at steering box is neither damaged nor twisted, as twisted boots soon become worn.
- Only tighten lock nuts for threaded section when vehicle is standing on ground - track rod end must be parallel with arm of suspension strut.

- Tighten lock nut -B- to 50 Nm and check toe-in value again.

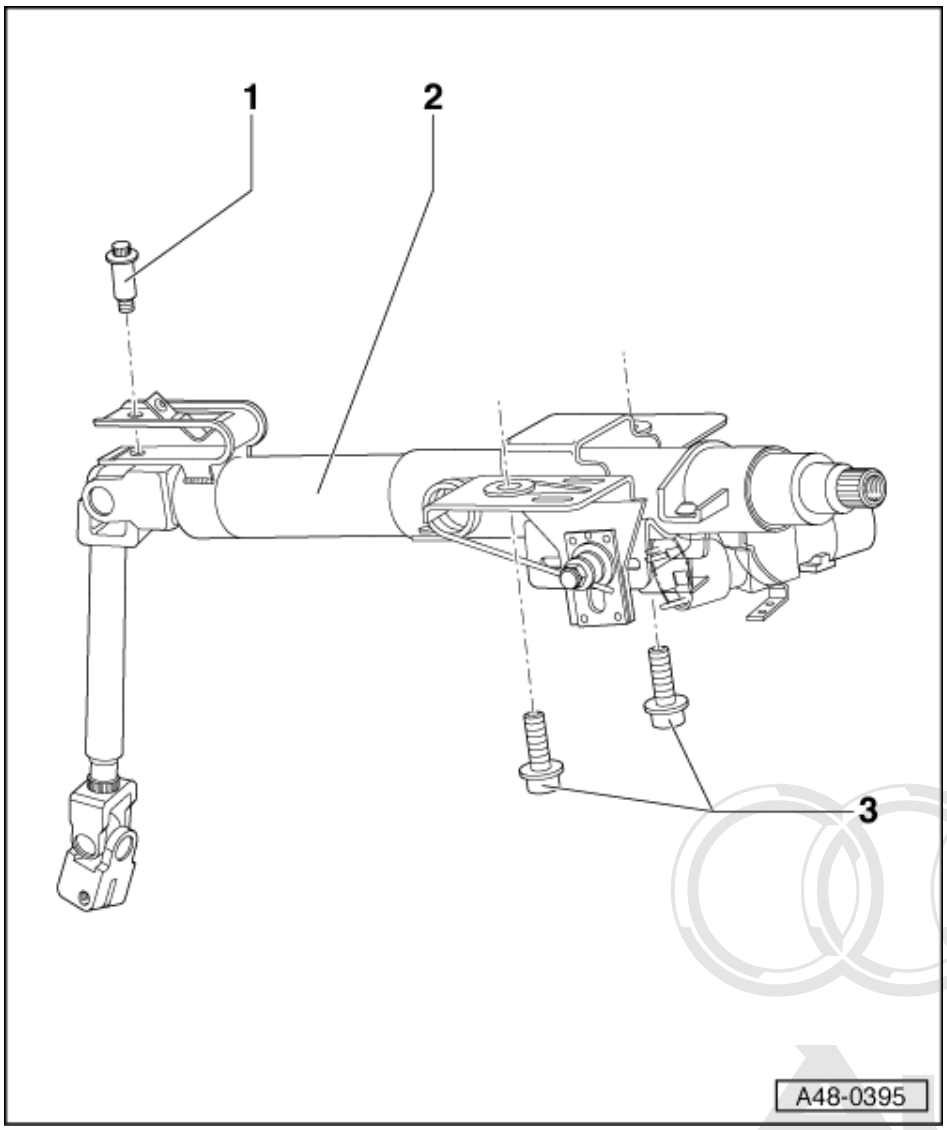
Value set may deviate slightly after tightening lock nut -B-.

Setting is however correct if measured toe value is within tolerance.

48 - Steering

1 - Steering column and steering wheel with airbag

1.1 - Steering column and steering wheel with airbag



General:

Steering components are not to be welded or straightened.

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1.2 - Exploded view of components

1 **Fitted shear bolt**
- Tighten until head shears off (7...12 Nm)

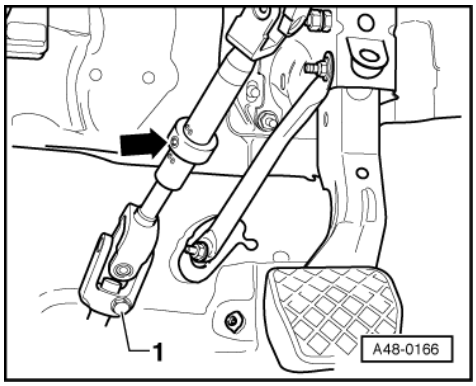
2 **Steering column**

- Different versions; assignment

=> Parts List

- Depending on design status, fitted with clamping ring to prevent rattling noise => Fig. 1

3 Combi bolt, 22 Nm



-> Fig.1 Clamping ring for steering column

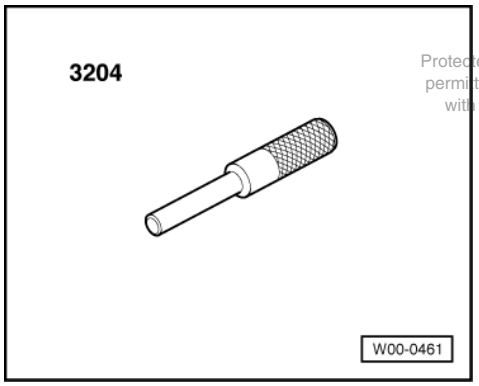
Vehicles manufactured between approx. 01.97 and 02.98 are fitted with a clamping ring -arrow- in the steering column to prevent rattling noise.
An enhanced steering column was introduced as of roughly 02.98 and the clamping ring discontinued. Vehicles in the following ident. no. range are equipped as standard with a clamping ring:

LHD	Ident. no.
Manual gearbox	8L_VA 057 550 ... 8L WA 055 105
Automatic gearbox	8L_VA 057 550 ... 8L_WA 047 794
RHD	**Ident. no.**
Manual gearbox	8L_VA 057 550 ... 8L_WA 058 901
Automatic gearbox	8L_VA 057 550 ... 8L_WA 057 482

Vehicles up to ident. no. 8L_VA 057 549 can be retrofitted in the event of rattling noise in the steering column with a split clamping ring, part no. 1J0 419 838 A.

=> Technical Service Handbook

1.3 - Checking steering column for damage



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Special tools and workshop equipment required

- Mandrel 3204
- Caliper gauge

Visual inspection

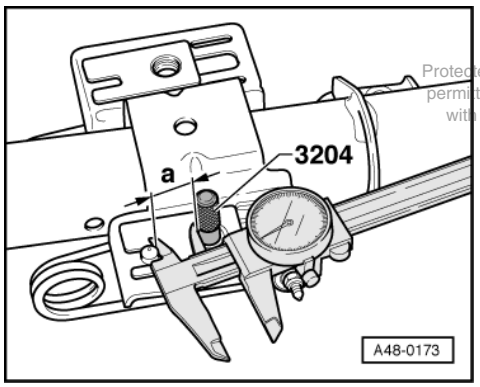
- Check whether steering column components reveal signs of damage.

Checking operation

- Check whether steering column can be turned without catching or stiffness.
- Check whether axial position and height of steering column can be adjusted.

The steering column is provided with so-called deformation elements designed to give way in the event of an accident.

These are located at the two upper bolted joints of the steering column.



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- -> In the event of possible damage, remove steering column to the extent required to permit checking of dimension -a-.
  - Dimension a = 23 mm
- If dimension -a- is greaterthan 23 mm, steering column is damaged and must be replaced.

1.4 - Safety precautions when working on airbag

=> General Body Repairs, Interior; Repair Group 69; Airbag Safety Regulations; Safety precautions when working on airbag Airbag Safety Regulations Safety precautions when working on airbag

1.5 - Removing and installing airbag unit

Removing and installing driver's airbag

=> General Body Repairs, Interior; Repair Group 69; Servicing driver's airbag Servicing driver's airbag

1.6 - Measures to be taken after servicing

Following battery connection:
Heed notes.
Notes:
- On re-connecting battery, remember to activate vehicle equipment (radio/radio navigation system, clock, electric window lifters) in line with owner's manual.
- Deactivate telematics control-unit service mode.

=> Radio, Telephone, Navigation; Repair Group 91
- For further operations after re-connecting power supply, refer to

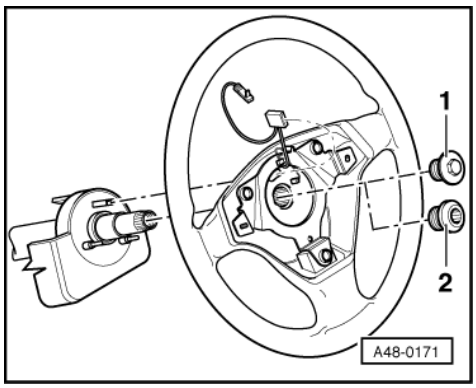
=> Injection and Ignition System; Repair Group 24

1.7 - Removing and installing airbag steering wheel

Removing
- Remove driver's airbag unit.

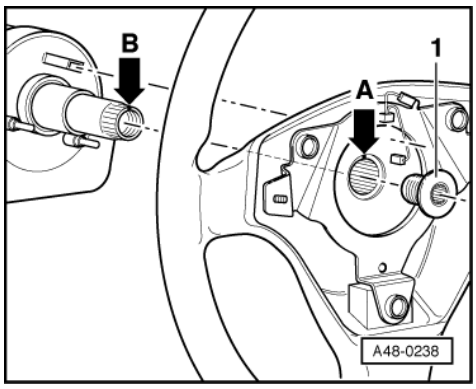
=> General Body Repairs, Interior; Repair Group 69; Servicing driver's airbag Servicing driver's airbag

Attention:
- **Wheels must be in straight ahead position when removing steering wheel.**
- **Steering wheel must be in centre position.**
- **Coil connector with slip ring must not be turned out of centre position (secure in installation position using adhesive tape).**



- -> Unscrew bolt and detach steering wheel.

1 - Hexagon bolt
2 - Multi-point socket head bolt



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Installing

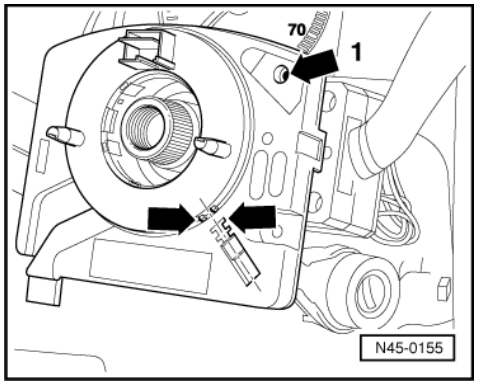
Install in reverse order, paying attention to the following:

-> Steering wheel and steering column are marked.

A - Line on steering wheel
B - Centre punch mark on steering column

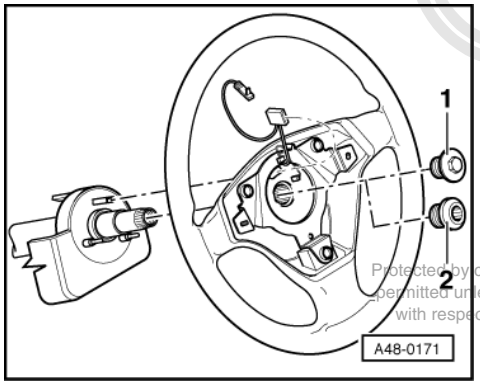
This position should not be altered.

Otherwise centre position of rack is not guaranteed.



Vehicles with ESP:

- -> Check whether yellow dot is visible in hole -arrow 1- and that the two marks -arrows- are aligned.



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All models:

- -> Attach steering wheel and secure with new bolt.
- Install driver's airbag unit.

=> General Body Repairs, Interior; Repair Group 69; Servicing driver's airbag Servicing driver's airbag

Vehicles with ESP:

- Start basic setting for steering angle sender -G85.

=> Running Gear, Self-diagnosis; Repair Group 01

- On vehicles with ABS/ESP Mark 60, perform ESP drive test.

=> Running Gear, Self-diagnosis; Repair Group 01

Tightening torque

Component		Nm
Steering wheel to steering column	Hexagon bolt	75 1)
	Multi-point socket head bolt	50 1)

1) Replace bolt

1.8 - Removing and installing coil connector with slip ring and steering angle sender -G85

Removing

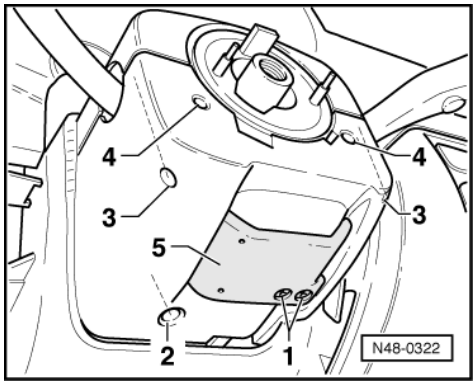
- Remove steering wheel => Page 289 .

Attention:
- **Wheels must be in straight ahead position when removing steering wheel.**
- **Steering wheel must be in centre position.**

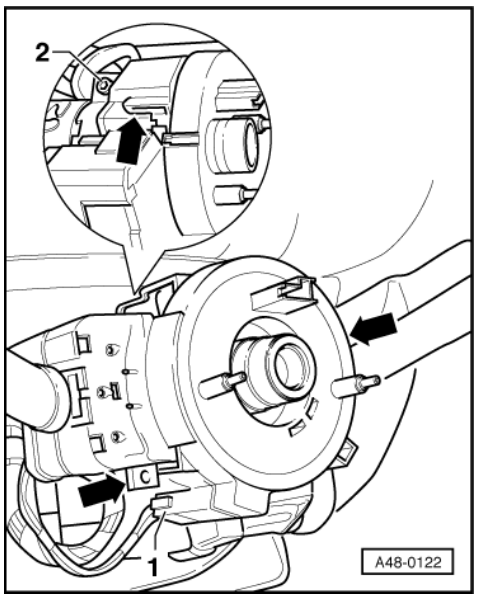
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- Remove driver's storage compartment.

=> General Body Repairs, Interior; Repair Group 68; Storage compartments/covers and trim panels; Removing driver's storage compartment Storage compartments/covers and trim panels Removing driver's storage compartment

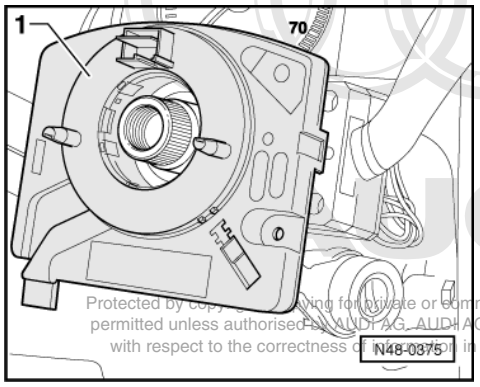


- -> Screw out bolts -1- and detach handle for steering column adjustment -5-.
- Screw out bolts -2...4-.
- Detach upper and lower steering column trim sections.



Vehicles without ESP:

- -> Unplug connector -1-.
- Use adhesive tape to secure coil connector with slip ring in installation position.
- Release fasteners -arrows- and detach coil connector with slip ring from steering column switch.

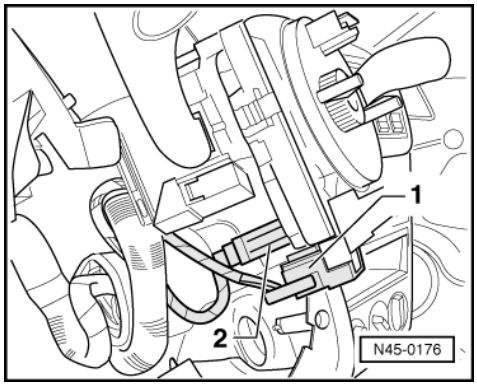


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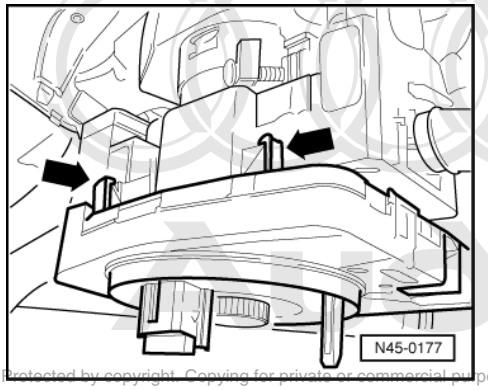
Vehicles with ESP:

Note:

-> On vehicles with ESP (electronic stability program), coil connector with slip ring -Item 1- is integrated into housing of steering angle sender -G85.



- -> Unplug connectors -1- and -2-.



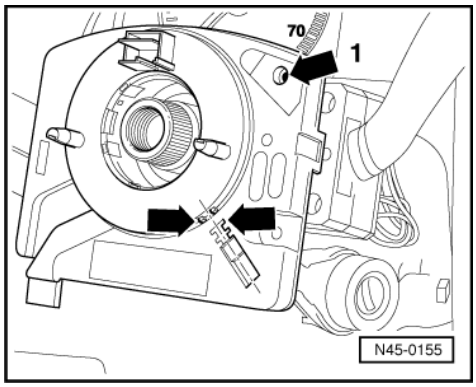
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- -> Carefully release upper fasteners -arrows-.
- Carefully release lower fasteners and detach housing of coil connector with slip ring and steering angle sender from steering column switch.

Installing

Install in reverse order, paying attention to the following:

- Slide housing of coil connector with slip ring and steering angle sender onto steering column switch until all fasteners are heard to engage.
- Break off transportation protection to remove/detach adhesive securing tape.



Vehicles with ESP:

- -> Move steering angle sender to centre position.
  - Yellow dot must be visible in hole -arrow 1- and the two marks -arrows- must be aligned

All models:

- Install driver's storage compartment.

=> General Body Repairs, Interior; Repair Group 68; Storage compartments/covers and trim panels; Removing driver's storage compartment Storage compartments/covers and trim panels Removing driver's storage compartment

- Fit steering wheel => Page 290 .

Vehicles with ESP:

- Start basic setting for steering angle sender -G85.

=> Running Gear, Self-diagnosis; Repair Group 01

- On vehicles with ABS/ESP Mark 60, perform ESP drive test.

=> Running Gear, Self-diagnosis; Repair Group 01

1.9 - Removing and installing steering column

General

- New replacement steering columns feature a transportation safeguard. This is to be pulled out after installing steering column.
- It is advisable to keep the transportation safeguard as it can be used on steering column removal.

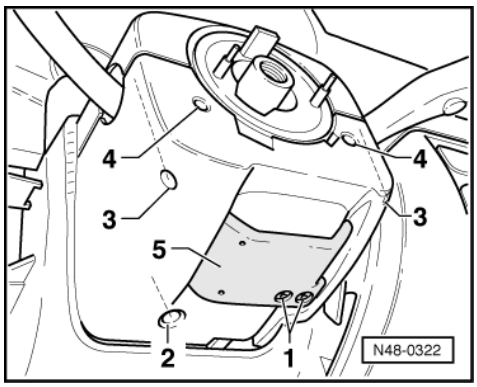
Removing

- Remove steering wheel => Page 289 .

Attention:
- **Wheels must be in straight ahead position when removing steering wheel.**
- **Steering wheel must be in centre position.**

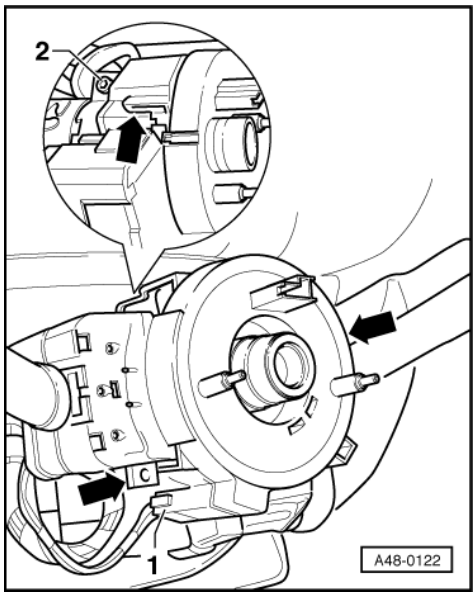
- Remove driver's storage compartment.

=> General Body Repairs, Interior; Repair Group 68; Storage compartments/covers and trim panels; Removing driver's storage compartment Storage compartments/covers and trim panels Removing driver's storage compartment



- -> Screw out bolts -1- and detach handle for steering column adjustment -5-.
- Screw out bolts -2...4-.
- Detach upper and lower steering column trim sections.

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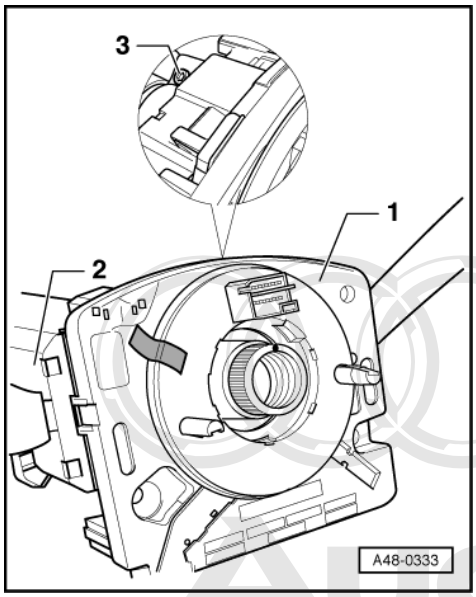


Vehicles without ESP:

- -> Unplug connector -1-.
- Slacken off bolt -2- of clamp until steering column switch can be detached.
- Unplug connectors for steering column switch.

Note:

Coil connector with slip ring is not to be detached from steering column switch. Make sure that coil connector with slip ring is not turned out of centre position (secure in installation position using adhesive tape).



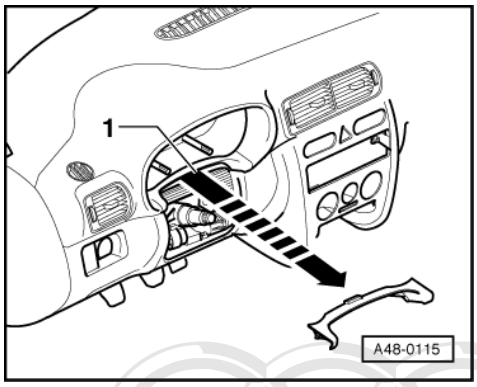
Vehicles with ESP:

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- -> Unplug connectors at steering angle sender -G85 and coil connector with slip ring.
- Slacken off bolt -3- of clamp until steering column switch can be detached.
- Unplug connectors -2- for steering column switch.

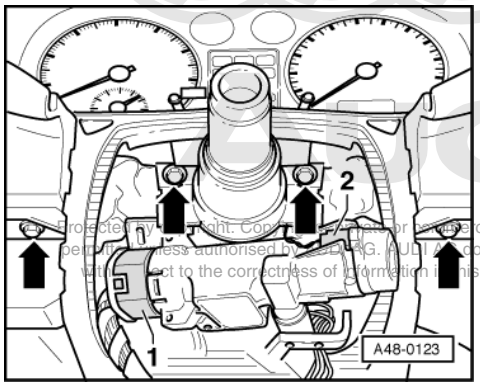
Note:

Coil connector with slip ring is not to be detached from steering column switch. Make sure that coil connector with slip ring is not turned out of centre position (secure in installation position using adhesive tape).



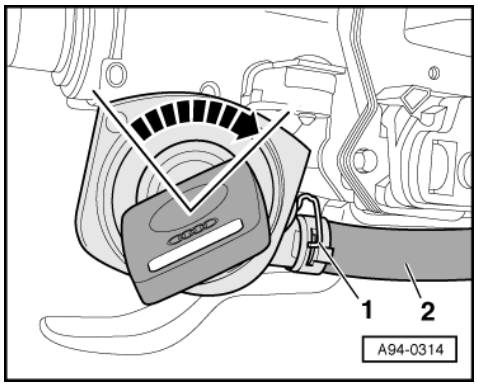
All models:

- -> Pull off surround -1- in direction of arrow.



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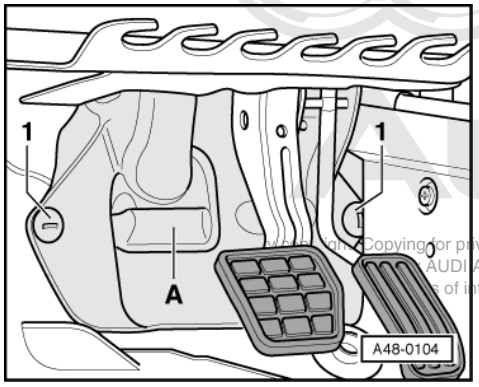
- -> Screw out bolts -arrows-.
- Detach surround at bottom.
- Unplug connectors at ignition/starter switch -1- and reader coil -2-.



Vehicles with automatic gearbox:

- Set selector lever to "P".
- -> Turn ignition key to "Ignition ON" position -arrow-.

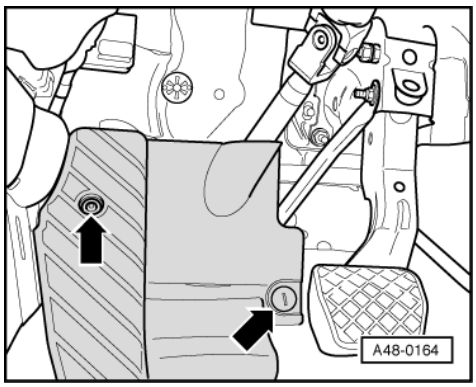
- Then lift interlock lever -1- slightly and pull locking cable -2- out of ignition lock housing.



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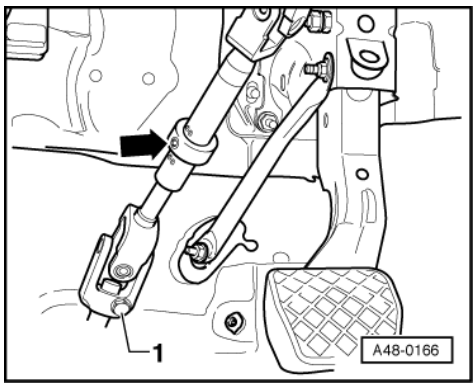
Left-hand drive vehicles:

- -> Unscrew plastic nuts -1- and take out cover -A-.



Right-hand drive vehicles:

- -> Remove footrest -arrows-.



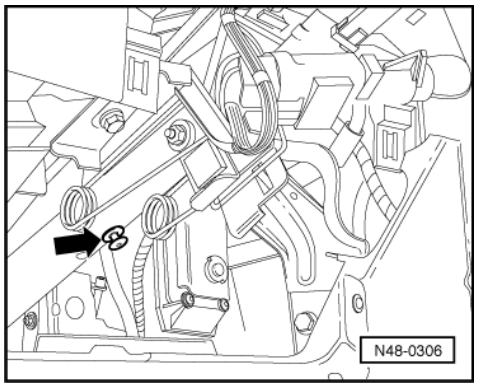
All models:

- -> Screw out bolt -1-.
- On vehicles with clamping ring -arrow-, slacken off hexagon socket-head bolt until mesh section can be compressed.
- Detach universal joint from steering box.

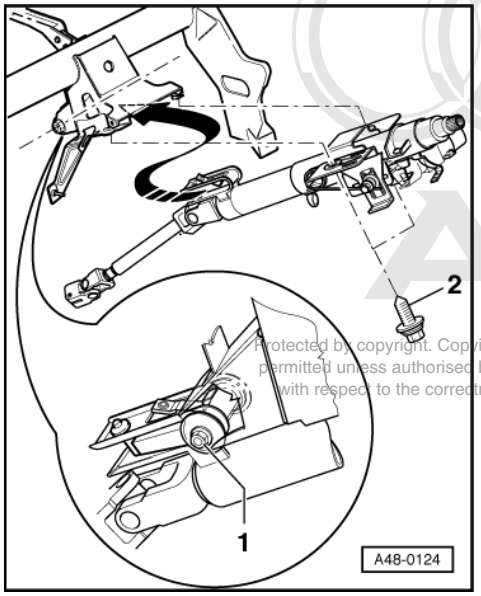
Securing steering column prior to removal

Notes:

- An assembly lock is required to prevent top and bottom parts of steering column being pulled apart when pulling off steering box.
- Mesh section will become separated if top and bottom parts of steering column are pulled too far apart or excessively telescoped. Rattling noise may subsequently be encountered if mesh section is no longer in its original installation position.

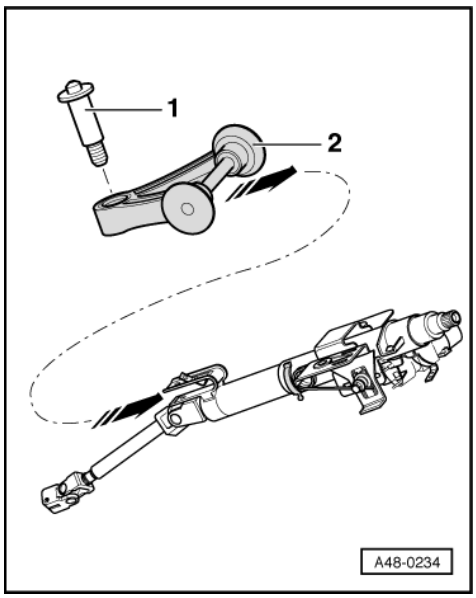


- -> Telescope steering column or pull it apart until hole -arrow- becomes visible.
- Insert clip, for example, in hole to secure.



- -> Unscrew nut -1- at central tube and pull out hexagon bolt.
- Screw out bolts -2- and take out steering column.

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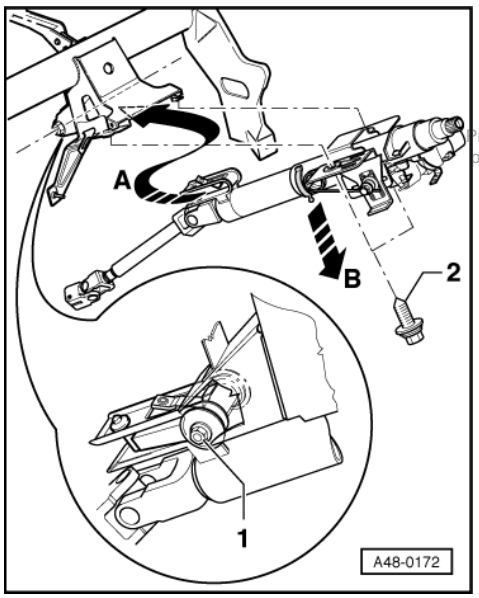
Installing

Install in reverse order, paying attention to the following:

Note:

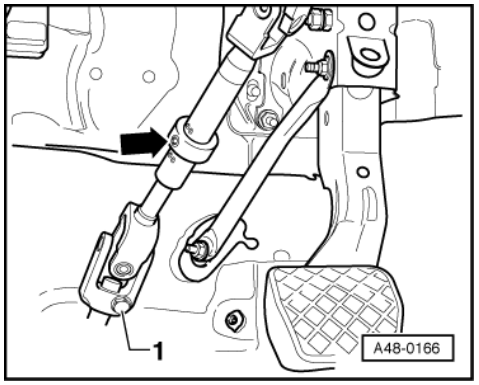
-> A mounting bush -2- and a shear bolt -1- are supplied with all new steering columns.

- Insert mounting bush in new steering column and tighten shear bolt until head shears off.



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- -> Insert steering column with mounting bush in central tube -arrow A-.
- Use new bolts for attachment.
- Insert hexagon bolt for mounting bush from right-hand side.
- Screw steering column to central tube -2-.
- Tighten nut -1-.
- Pull out transportation safeguard -arrow B-.



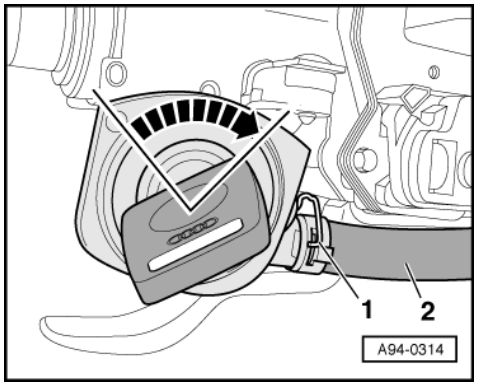
- -> Slip universal joint onto steering pinion and secure with new bolt -1-.
- If same steering column is re-installed and this was fitted with a clamping ring -arrow-, tighten hexagon socket-head bolt of clamping ring.

Note:

Clamping ring is no longer required if a new steering column is fitted.

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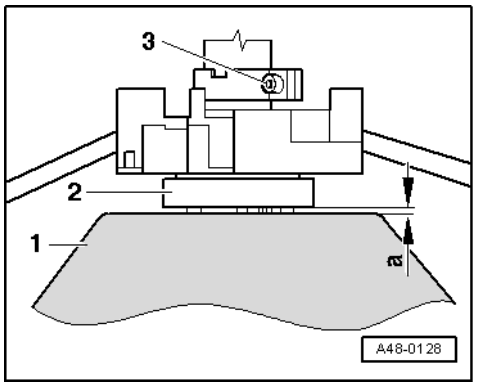
- Install universal joint cover/footrest.
- Attach connector for ignition/starter switch and reader coil.



Vehicles with automatic gearbox:

- Set selector lever to "P".
- -> Turn ignition key to "Ignition ON" position -arrow-.
- Slide locking cable -2- into ignition lock housing; interlock lever -1- must be heard to engage.
- Check ignition key removal lock.

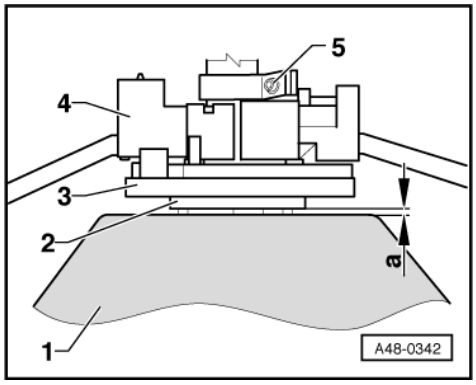
=> Automatic Gearbox; Repair Group 37; Servicing shift mechanism Servicing shift mechanism



Vehicles without ESP:

-> Fig. shows top view of steering column switch with steering wheel.

1 - Steering wheel
2 - Steering column switch with coil connector and slip ring
3 - Clamping bolt
a - = 3 mm



Vehicles with ESP:

-> Fig. shows top view of steering column switch with steering wheel.

1 - Steering wheel
2 - Housing with coil connector and slip ring
3 - Steering angle sender -G85
4 - Steering column switch
5 - Clamping bolt
a - = 3 mm

All models:

- Attach steering column switch to steering lock housing.
- Start by fitting steering wheel with old bolt.
- Horizontally align steering column switch and set dimension a = 3 mm. Then tighten clamping bolt.
- Detach steering wheel again.
- Fit lower and upper surround.
- Fit lower and upper steering column switch trim.

- Install driver's storage compartment.

=> General Body Repairs, Interior; Repair Group 68; Storage compartments/covers and trim panels; Removing driver's storage compartment Storage compartments/covers and trim panels Removing driver's storage compartment

- Fit steering wheel => Page 290 .

Tightening torques

Component	Nm
Steering column to central tube	22
Mounting bush to central tube	9,5
Universal joint to steering pinion	20 + 90° 1)2)
Clamping ring to steering column	17

1) 90°corresponds to quarter turn

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2) Replace bolts

1.10 - Removing and installing ignition lock housing

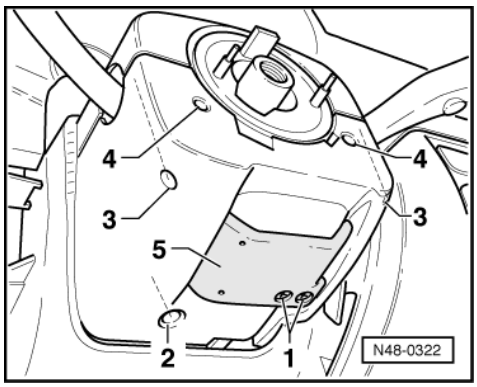
Removing

- Remove steering wheel => Page 289 .

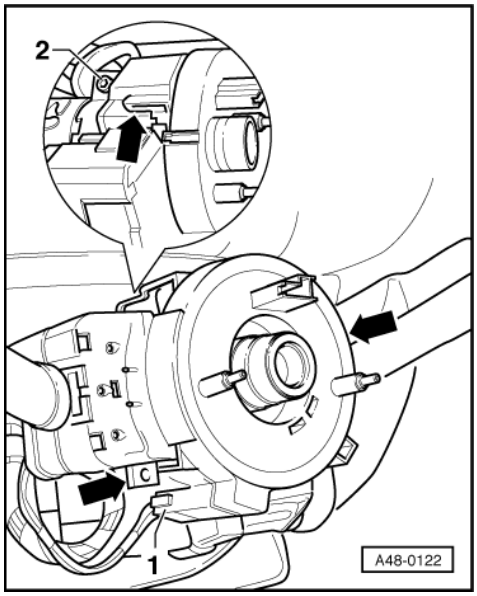
Attention:
- **Wheels must be in straight ahead position when removing steering wheel.**
- **Steering wheel must be in centre position.**

- Remove driver's storage compartment.

=> General Body Repairs, Interior; Repair Group 68; Storage compartments/covers and trim panels; Removing driver's storage compartment Storage compartments/covers and trim panels Removing driver's storage compartment



- -> Screw out bolts -1- and detach handle for steering column adjustment -5-.
- Screw out bolts -2...4-.
- Detach upper and lower steering column trim sections.



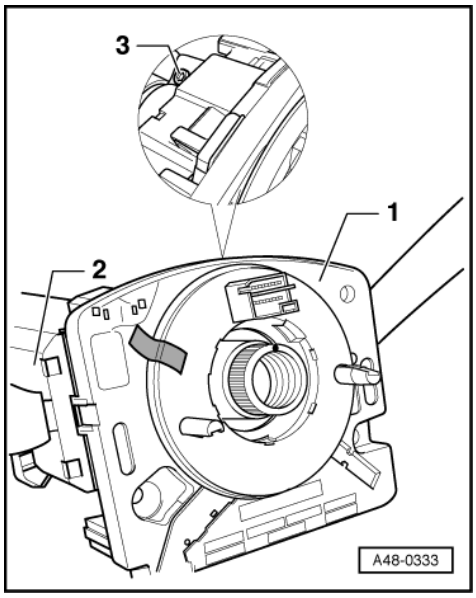
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Vehicles without ESP:

- -> Unplug connector -1-.
- Slacken off bolt -2- of clamp until steering column switch can be detached.
- Unplug connectors for steering column switch.

Note:

Coil connector with slip ring is not to be detached from steering column switch. Make sure that coil connector with slip ring is not turned out of centre position (secure in installation position using adhesive tape).

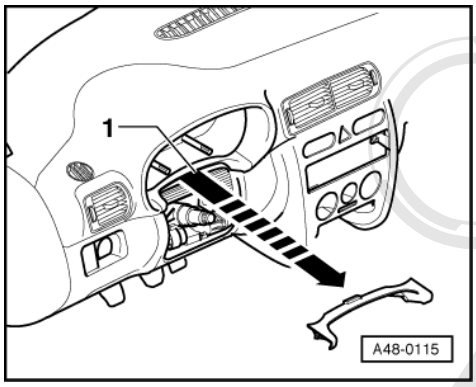


Vehicles with ESP:

- -> Unplug connectors at steering angle sender -G85 and coil connector with slip ring.
- Slacken off bolt -3- of clamp until steering column switch can be detached.
- Unplug connectors -2- for steering column switch.

Note:

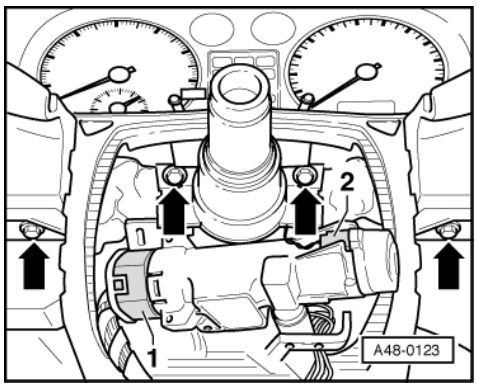
Coil connector with slip ring is not to be detached from steering column switch. Make sure that coil connector with slip ring is not turned out of centre position (secure in installation position using adhesive tape).



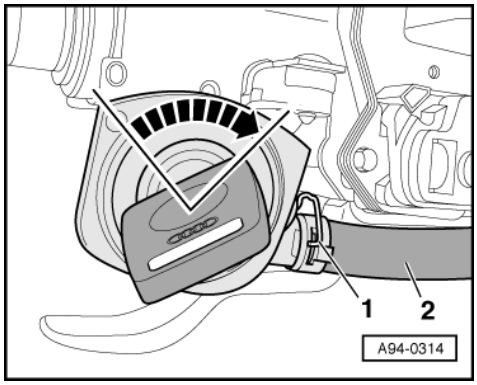
All models:

- -> Pull off surround -1- in direction of arrow.

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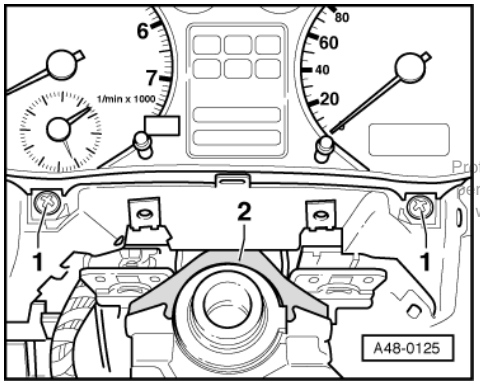
- -> Screw out bolts -arrows-.
- Detach surround at bottom.
- Unplug connectors at ignition/starter switch -1- and reader coil -2-.



Vehicles with automatic gearbox:

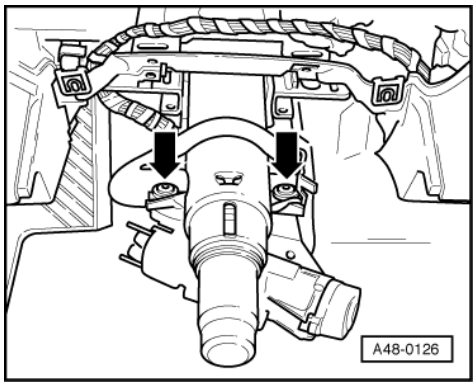
- Set selector lever to "P".
- -> Turn ignition key to "Ignition ON" position -arrow-.
- Then lift interlock lever -1- slightly and pull locking cable -2- out of ignition lock housing.
- Remove ignition/starter switch.

=> Electrical System; Repair Group 94; Servicing lock cylinder and ignition/starter switch Servicing lock cylinder and ignition/starter switch



- -> Screw out bolts -1-.
- Pull out dash panel insert slightly.
- Unfasten cable ties on back and release locking tabs of multi-pin connectors.
- Unplug multi-pin connectors at dash panel insert.

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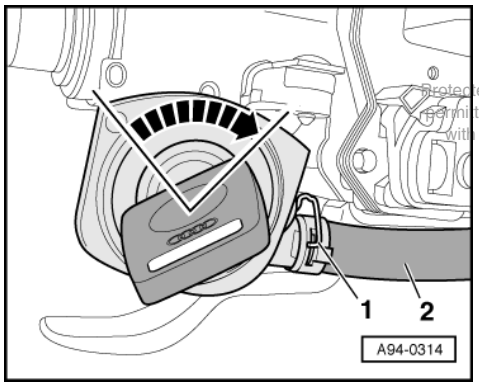


- -> Drill out or if necessary chisel out shear bolts -arrows- and take out ignition lock housing.

Installing

Install in reverse order, paying attention to the following:

- Insert ignition lock housing and secure with new shear bolts.
- Tighten shear bolts until head shears off.
- Attach connector for ignition/starter switch and reader coil.

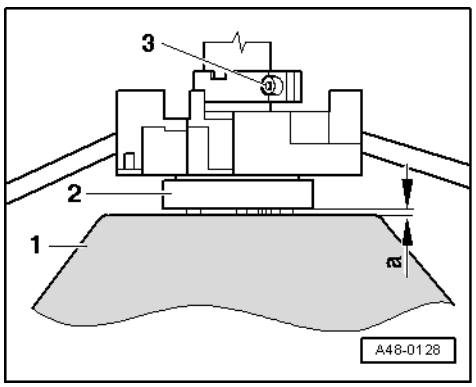


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Vehicles with automatic gearbox:

- Set selector lever to "P".
- -> Turn ignition key to "Ignition ON" position -arrow-.
- Slide locking cable -2- into ignition lock housing; interlock lever -1- must be heard to engage.
- Check ignition key removal lock.

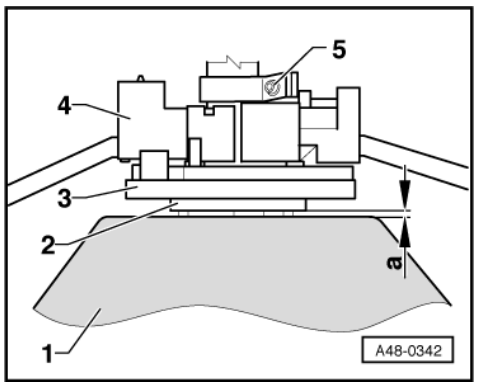
=> Automatic Gearbox; Repair Group 37; Servicing shift mechanism Servicing shift mechanism



Vehicles without ESP:

-> Fig. shows top view of steering column switch with steering wheel.

1 - Steering wheel
2 - Steering column switch with coil connector and slip ring
3 - Clamping bolt
a - = 3 mm



Vehicles with ESP:

-> Fig. shows top view of steering column switch with steering wheel.

1 - Steering wheel
2 - Housing with coil connector and slip ring
3 - Steering angle sender -G85
4 - Steering column switch
5 - Clamping bolt
a - = 3 mm

All models:

- Attach steering column switch to steering lock housing.
- Start by fitting steering wheel with old bolt.
- Horizontally align steering column switch and set dimension a = 3 mm. Then tighten clamping bolt.
- Detach steering wheel again.
- Fit lower and upper surround.
- Fit lower and upper steering column switch trim.
- Install driver's storage compartment.

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=> General Body Repairs, Interior; Repair Group 68; Storage compartments/covers and trim panels; Removing driver's storage compartment Storage compartments/covers and trim panels Removing driver's storage compartment

- Fit steering wheel => Page 290 .

2 - Servicing power steering

2.1 - Servicing power steering

Power-assisted steering box servicing work is not envisaged.

In the event of problems, consult Fault Finding No. 10: Running Gear and employ pressure test and leak test to establish cause.

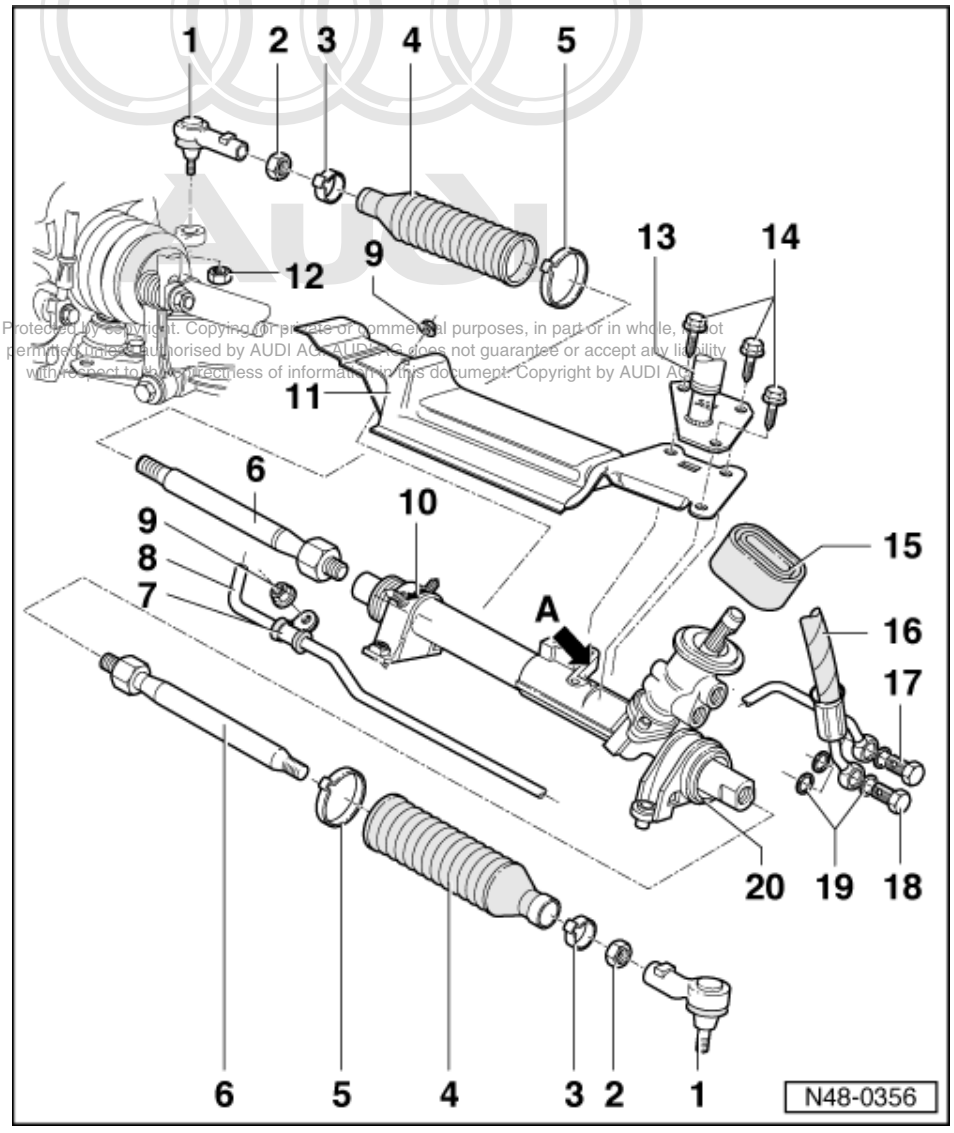
=> Service. Fault-Finding: Running Gear
Replace power-assisted steering box if fault is found.
Steering components are not to be welded or straightened.

2.2 - Rules for cleanliness

Pay careful attention to the following rules for cleanliness when working on steering box.

- Carefully clean all joints and adjacent areas before disconnecting.
- Place parts removed on a clean surface and cover them over. Make use of sheeting or paper. Do not use fluffy cloths.
- Carefully cover or seal opened components if repairs are not to be performed immediately.
- Only install clean components:
  Do not remove replacement parts from wrapping until immediately prior to installation. Only use parts in original packaging.
- When system is open:
  Do not work with compressed air if at all possible.
  Do not move vehicle unless absolutely necessary.

2.3 - Exploded view of power-assisted steering box



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Left-hand drive vehicles

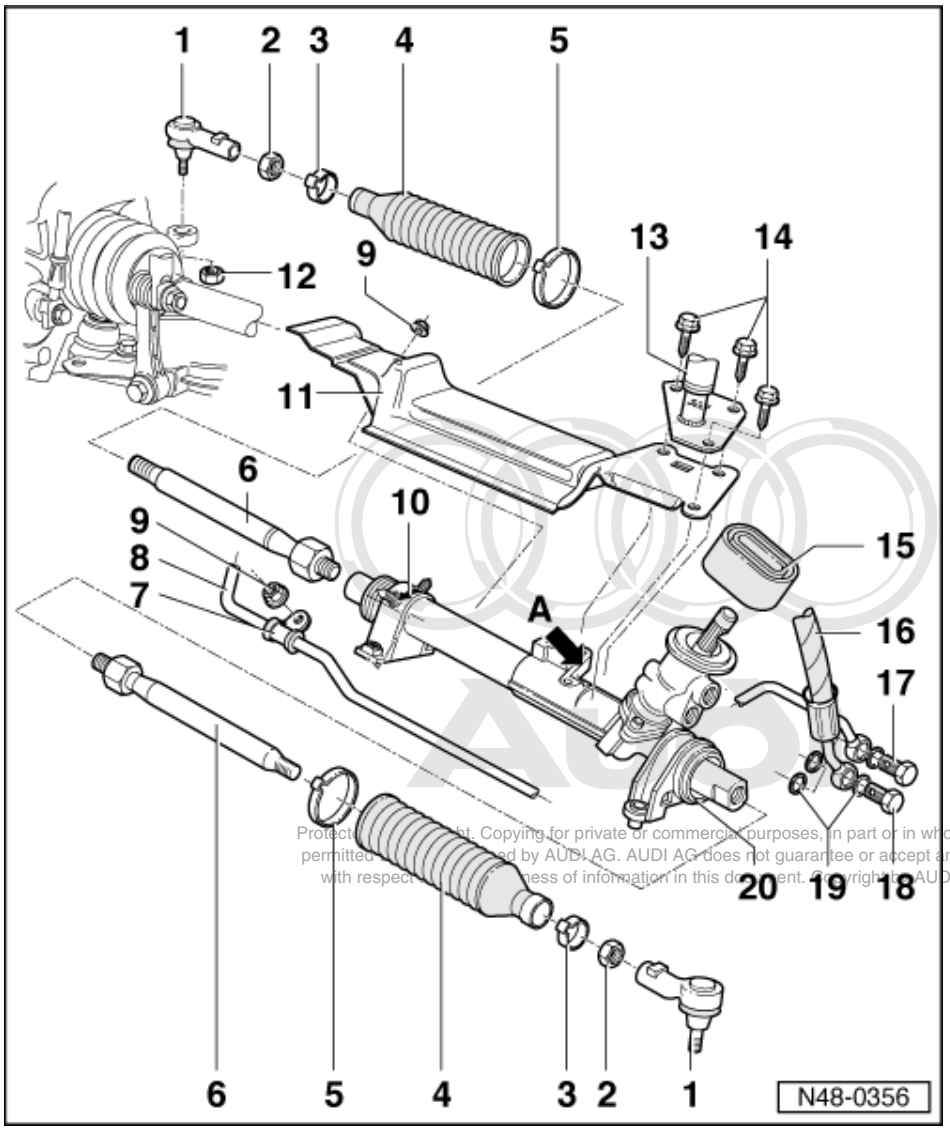
1 Track rod end

- For Audi A3 up to vehicle ident. no. 8L_WA 050 421 => Fig. 1
- For Audi A3 as of vehicle ident. no. 8L_WA 050 422 => Fig. 2
- For Audi S3: Thread fitted from underneath in steering arm
- Different version on left and right; assignment

=> Parts List

2 Lock nut, 50 Nm

- Provide support at flats of track rod end when unfastening and tightening



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3 Clamp

- Replace
- Tensioning => Fig. 6

4 Bellows

- Replacement involves removing steering box
- Fitting => Fig. 5

5 Clamp

- Replace
- Tensioning => Fig. 6

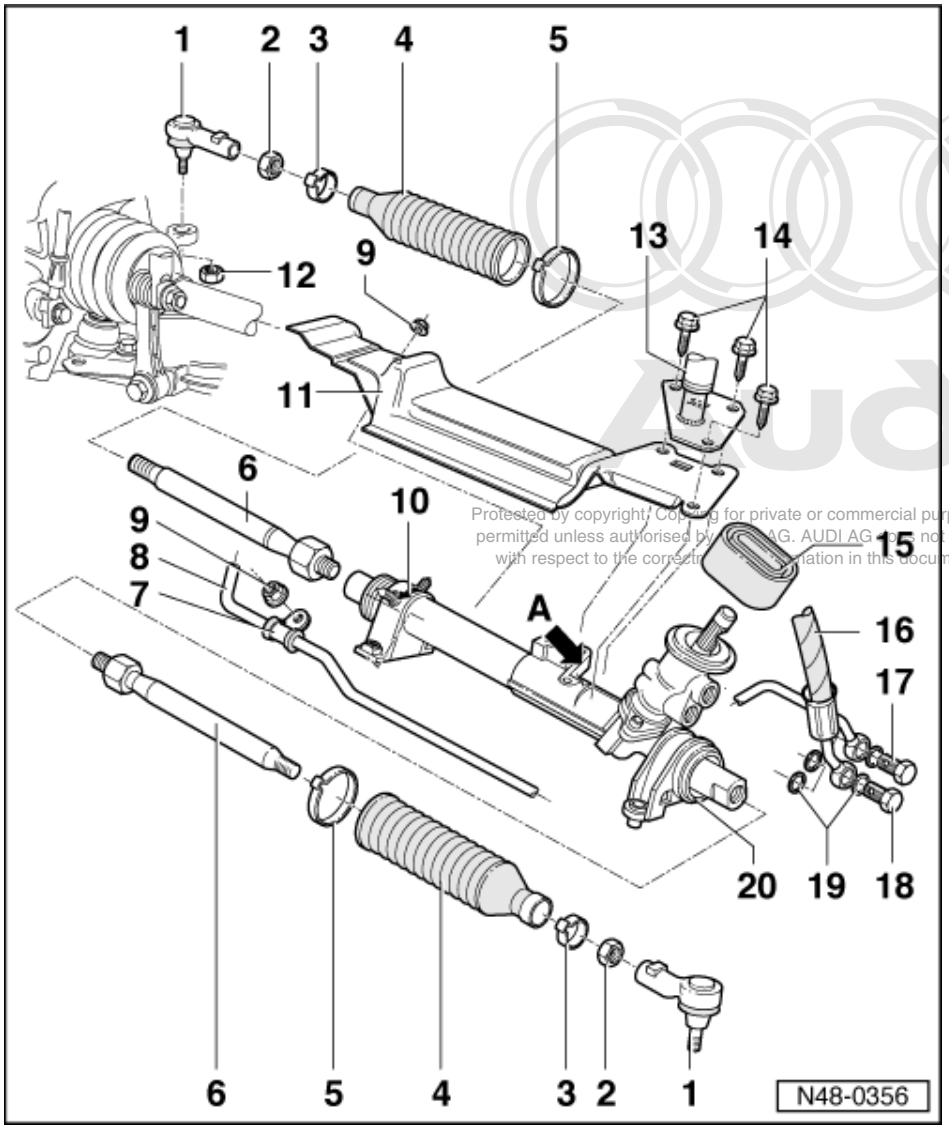
6 Track rod 75 Nm

- Different lengths for Audi A3 => Fig. 3
- Removing and installing =>Fig. 4
- Replacement part supplied pre-set

7 Clamp with rubber element

8 Return pipe

9 Nut, 23 Nm



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10 Clamp with rubber bush

- Arrow on clamp faces in direction of travel
- Replace in the event of damage to thread of welding nut

11 Heat shield

12 Nut, 45 Nm

- Self-locking
- Always replace after removing

13 Not installed

14 Bolt, 23 Nm

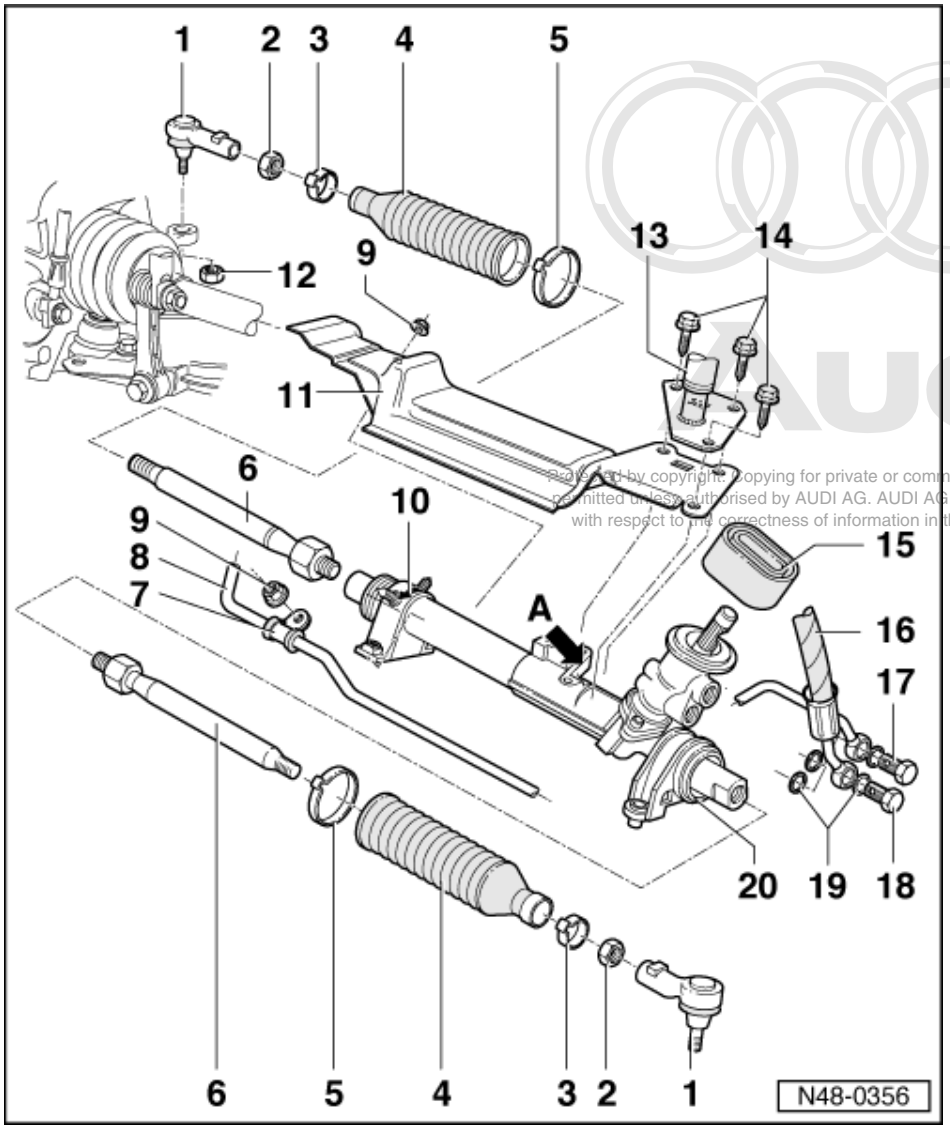
15 Sealing collar

- Check correct positioning at steering box pinion

16 Expansion hose

17 Banjo bolt, 45 Nm

- M16 x 1.5



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18 Banjo bolt, 38 Nm

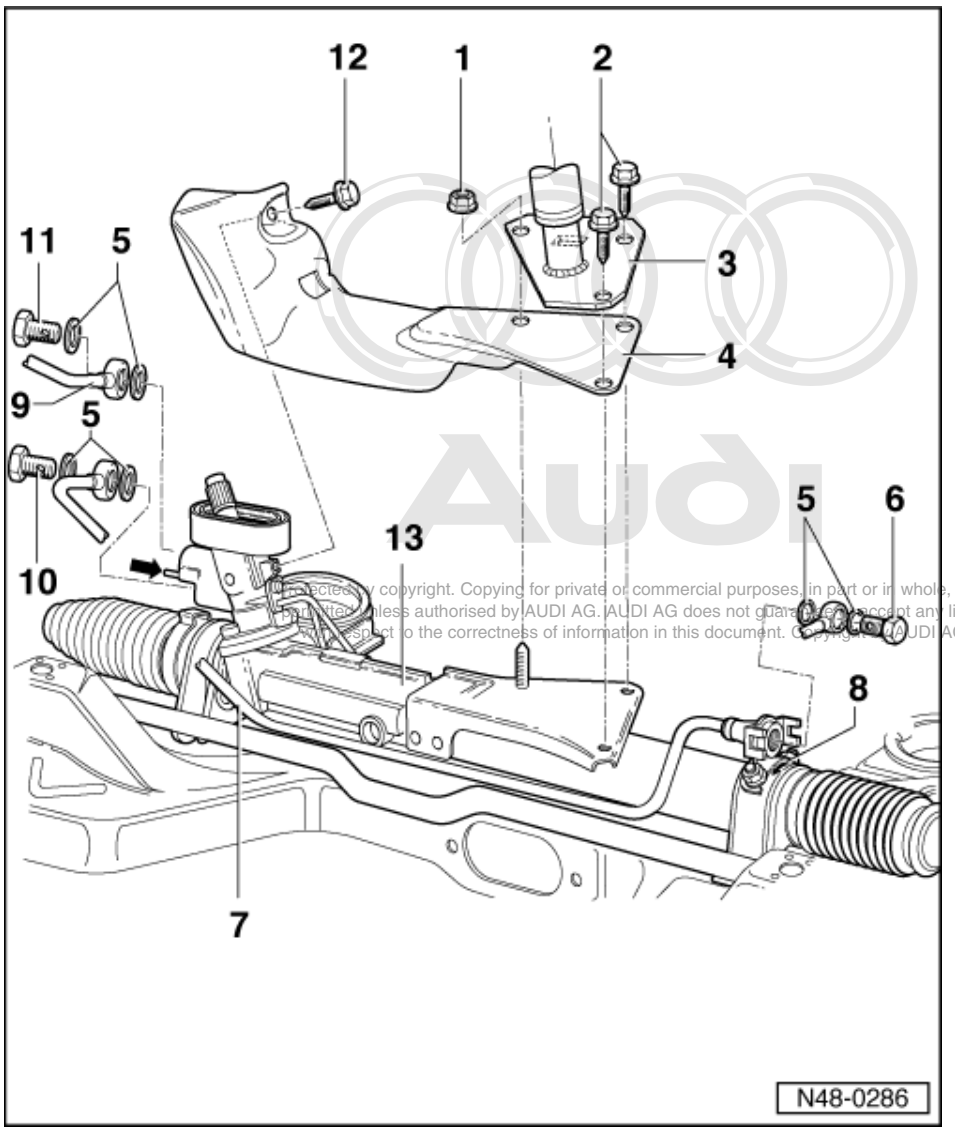
- M14 x 1.5

19 Sealing rings

- Replace

20 Power-assisted steering box

- Adjusting =>Page 318
- Removing and installing=>Page 319
- Before scrapping, defective steering boxes must always be drained => Page 6



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Right-hand drive vehicles

The tightening torques for the following bolted joints are the same for LHD and RHD steering boxes and are thus no longer listed here.

- Track rod end to wheel bearing housing
- Lock nut to track rod
- Track rod to steering box
- Steering box to subframe

1 Nut, 23 Nm

2 Bolt, 23 Nm

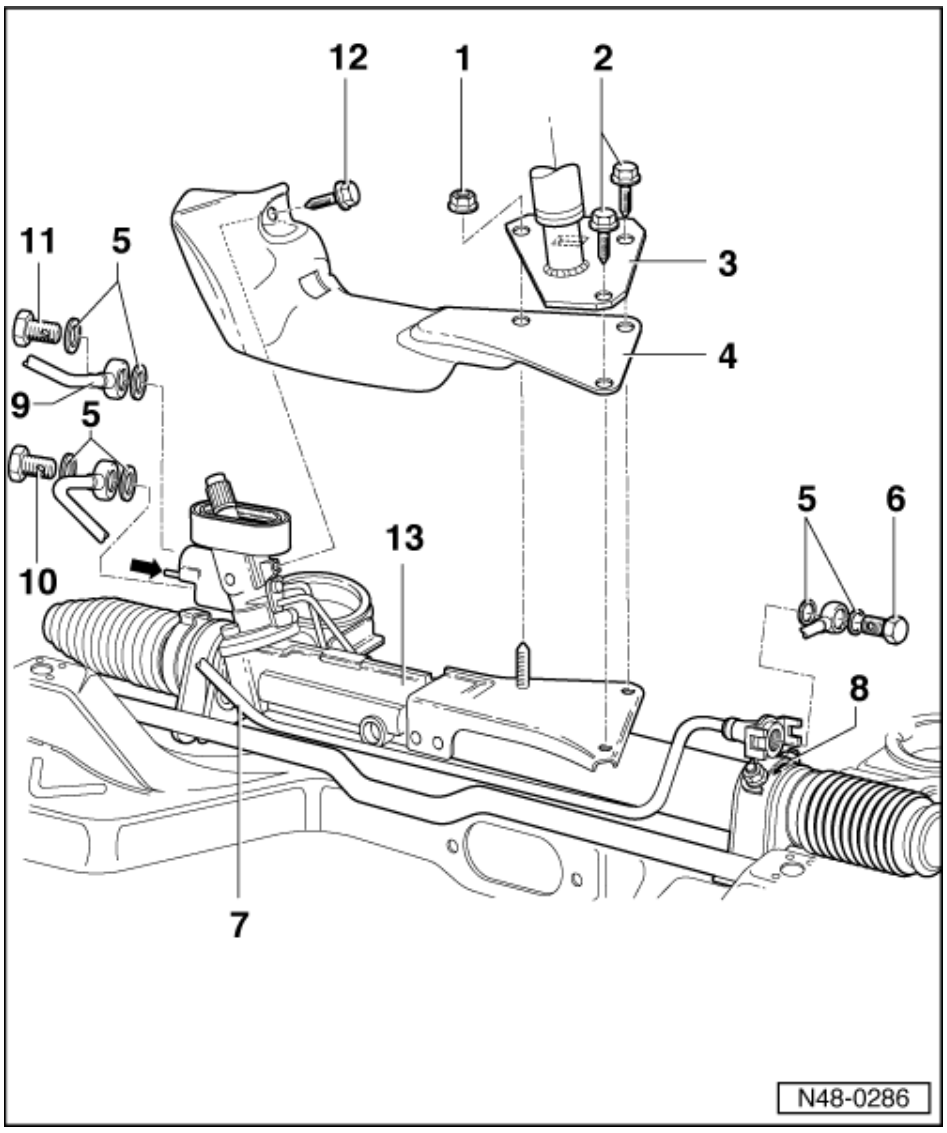
3 Not installed

4 Heat shield

- Version for 4WD vehicles
  => Page 313

5 Sealing rings

- Replace



6 Banjo bolt, 38 Nm
- M14 x 1.5

7 Return pipe
- Must rest on locating pin -arrow-

8 Clamp with rubber bush
- Arrow on clamp faces in direction of travel
- Replace in the event of damage to thread of welding nut

9 Return pipe

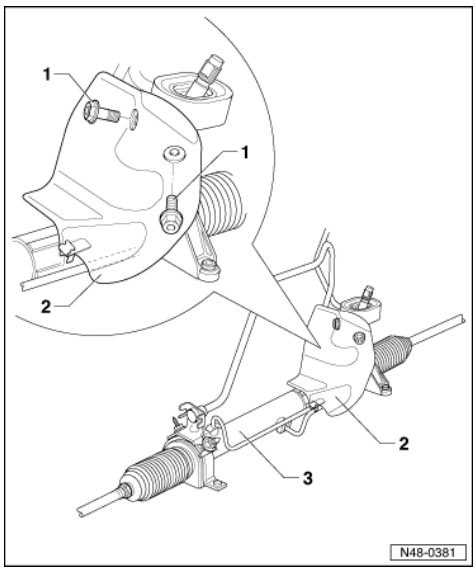
10 Banjo bolt, 38 Nm
- M14 x 1.5

11 Banjo bolt, 45 Nm
- M16 x 1.5 x 22

12 Bolt, 8 Nm

13 Power-assisted steering box
- Adjusting =>Page 318
- Removing and installing=>Page 319
- Before scrapping, defective steering boxes must always be drained => Page 6

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RHD and 4WD vehicles

The tightening torques for the following bolted joints are the same for LHD and RHD steering boxes and are thus no longer listed here.

- Track rod end to wheel bearing housing
- Lock nut to track rod
- Track rod to steering box
- Steering box to subframe

1 Bolt, 8 Nm

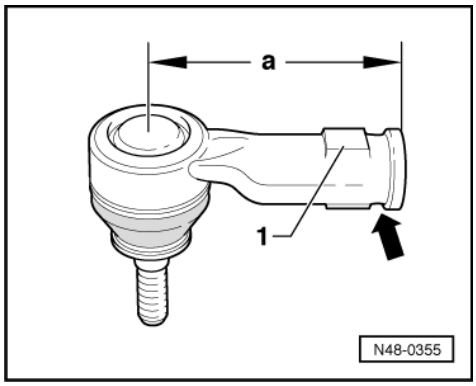
2 Heat shield

- Clamp is clipped to pressure pipe

3 Power-assisted steering box

- Adjusting =>Page 318
- Removing and installing=>Page 319
- Before scrapping, defective steering boxes must always be drained => Page 6

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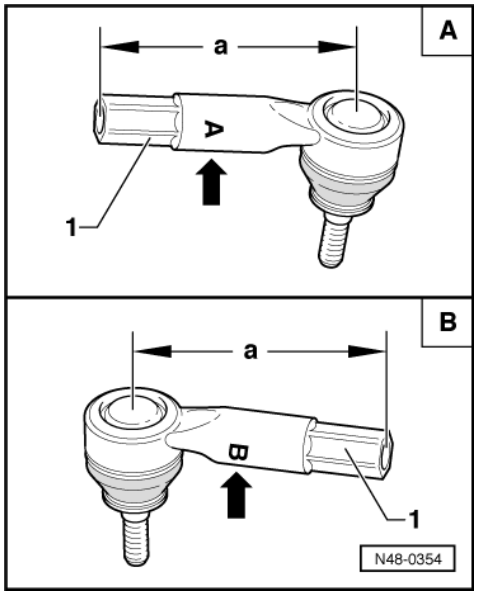
-> Fig.1 Track rod ends for Audi A3 up to vehicle ident. no.

8L_WA 050 421

1 - Flat at thread stem marked "R" or "L", width across flats 22 mm
a - 74 - 1 mm

Stem -arrow- is round

Dimensions of corresponding track rod => Fig. 3



-> Fig.2 Track rod ends for Audi A3 as of vehicle ident. no.

8L_WA 050 422

The distinguishing features of the modified track rod ends are as follows:

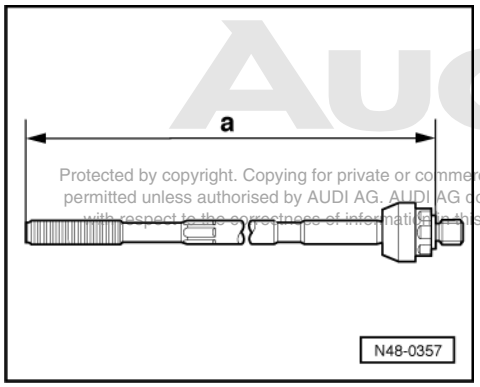
A - Right track rod end

1 - Hexagon at thread stem, width across flats 19 mm
a - 94 ± 0.5 mm
A - "Right" mark

B - Left track rod end

1 - Hexagon at thread stem, width across flats 19 mm
a - 94 ± 0.5 mm
B - "Left" mark

Dimensions of corresponding track rod => Fig. 3



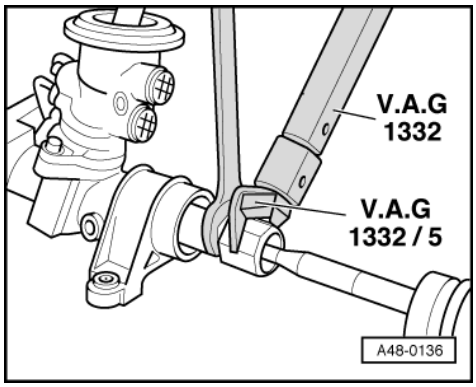
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-> Fig.3 Different track rod lengths for Audi A3

On the Audi A3, the track rods are assigned as follows to the track rod ends:

- Track rod for Audi A3 up to ident. no. 8L_WA 050 421 => Fig. 1
  Dimension a = 343.1 mm
- Track rod for Audi A3 as of ident. no. 8L_WA 050 422 => Fig. 2
  Dimension a = 318.9 mm

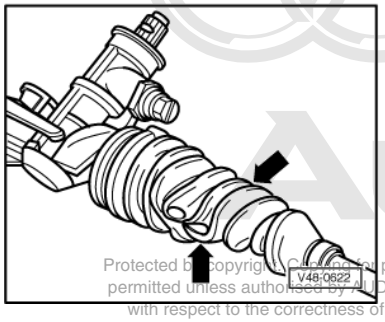
Attention:
It is not permissible to fit a combination of old and new track rods.



-> Fig.4 Removing and installing track rod

Track rods can only be unscrewed and screwed on after removing steering box.

- Seal off pipe connections at power-assisted steering box if this has not already been done.
- Clean outside of power-assisted steering box in area of bellows.
- Unfasten large clamp at bellows and pull back bellows.
- Provide support with open-ended wrench (21 mm) when unfastening and tightening.



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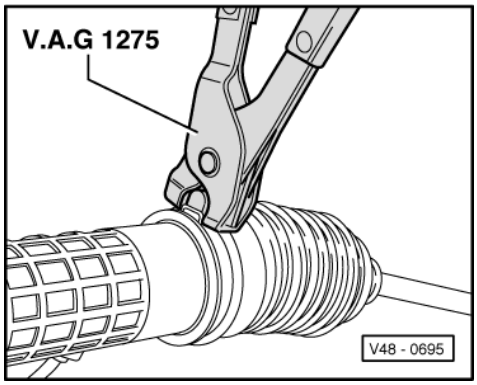
-> Fig.5 Fitting bellows

- Check bellows for wear (slits, cracks) and bellows sealing surfaces for dirt.

Note:

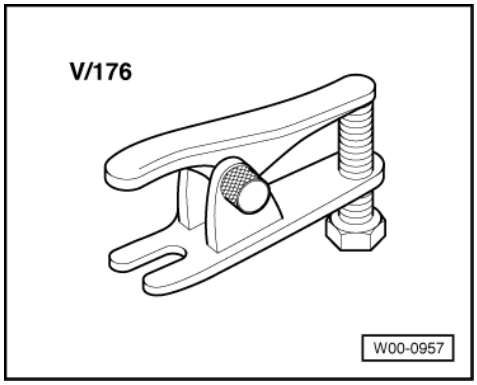
Bellows are never to be twisted on installation as shown here

-arrows-.



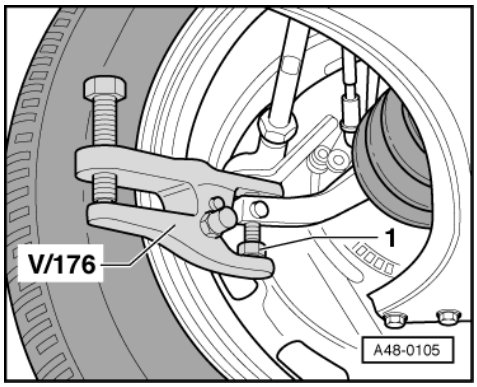
-> Fig.6 Tensioning clamp

2.4 - Removing and installing track rod end



Special tools and workshop equipment required

- Ball joint puller Matra V/176



Removing

- Unscrew nut from track rod end.

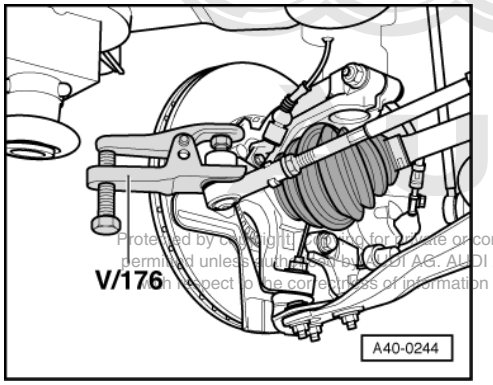
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Note:

Leave nut screwed several turns onto track rod end to protect thread.

Audi A3:

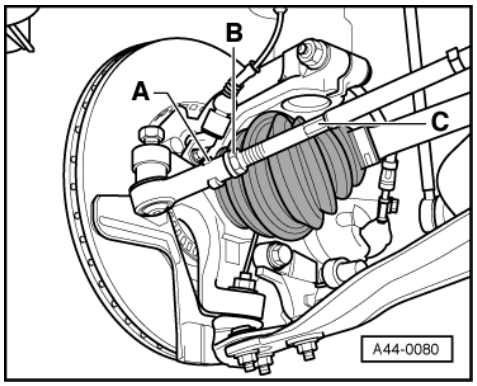
- -> Use puller Matra V/176 -Item 1- to press track rod off steering arm.



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Audi S3:

- -> Use puller Matra V/176 to press track rod off steering arm.



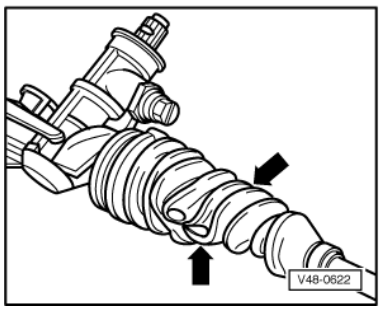
All models:

- -> Provide support at track rod end -A- with 24 mm wrench when unfastening/tightening lock nut -B-.

Note:

Fig. shows Audi S3 vehicle.

- Unfasten lock nut -B-.
- Unscrew track rod end -A- from track rod -C-.



Installing

Install in reverse order, paying attention to the following:

Note:

-> Bellows are never to be twisted on installation as shown here

-arrows-.

Tightening torques

Component	Nm
Track rod end to arm	45 1)
Lock nut to track rod end	50

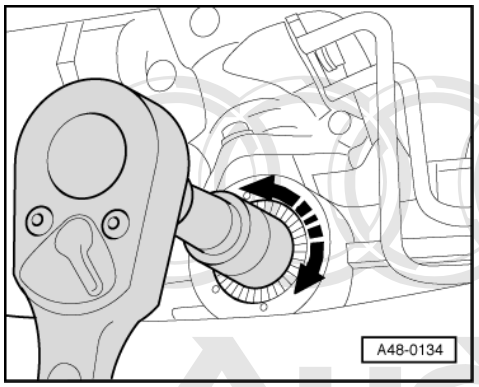
1) Replace nut

2.5 - Adjusting power-assisted steering box

Note:

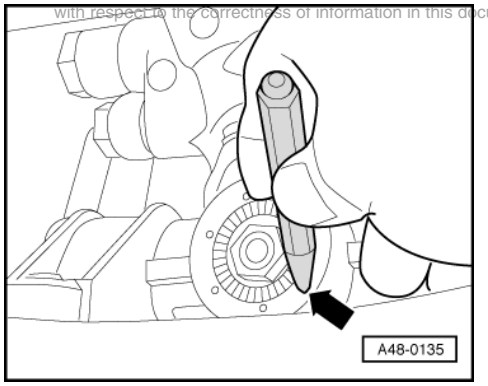
Two mechanics are required for adjustment, which is to be performed with engine switched off.

- Raise vehicle on lifting platform.
- Wheels in straight ahead position.
- Turning steering wheel back and forth (roughly 30°about centre axis) produces a rattling noise in the event of excessive steering play.



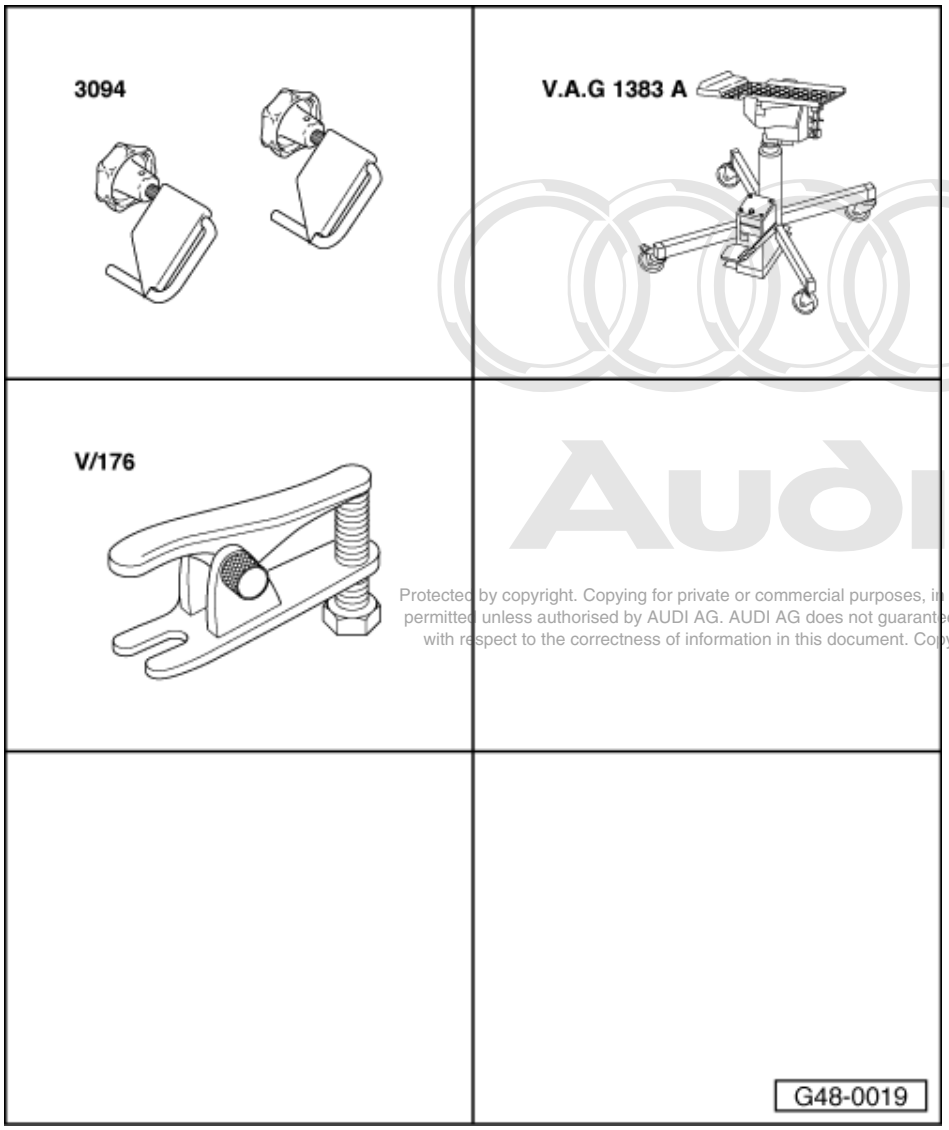
- -> Have second mechanic carefully screw in adjusting screw (arrow) until rattling noise disappears inside vehicle.
- Perform test drive and make sure that, after manoeuvring/cornering steering wheel returns automatically and smoothly to straight ahead position. Correct setting if necessary.

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- -> Secure adjusting nut to stop it turning by making centre punch mark -arrow- in collar of steering box housing.

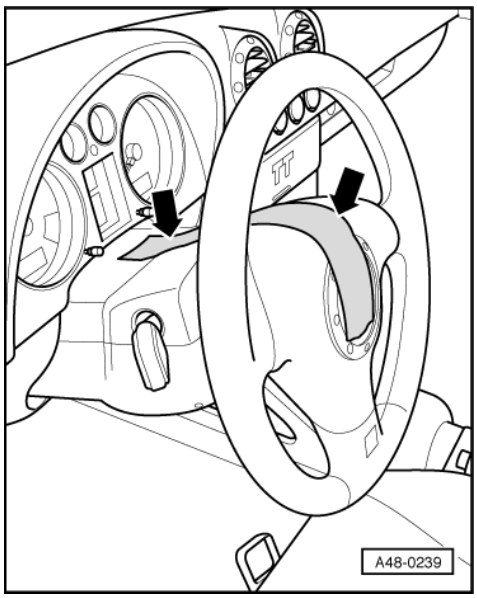
2.6 - Removing and installing power-assisted steering box



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Special tools and workshop equipment required

- Hose clamps 3094
- Engine/gearbox lifter V.A.G 1383 A
- Ball joint puller Matra V/176
- Caliper gauge

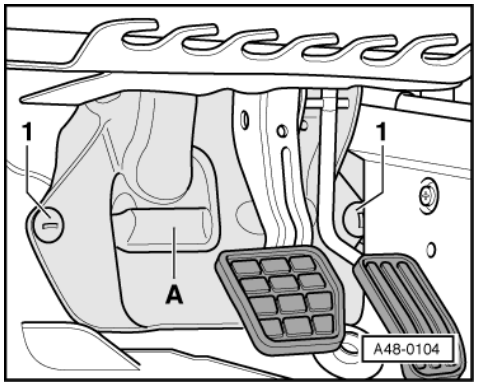


Note:

Observe rules for cleanliness =>Page 307 .

Attention:
Steering box must be removed with front wheels in straight ahead position so as not to damage return spring with slip ring at steering column switch.

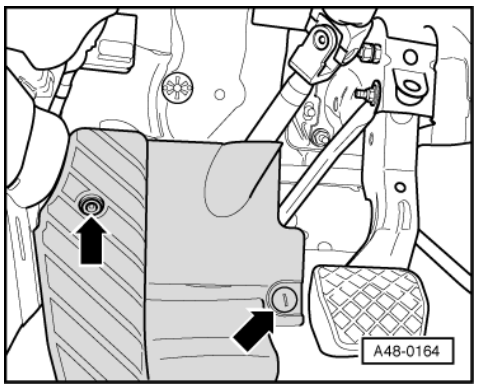
- -> With wheels in straight ahead position, secure steering wheel with adhesive tape to prevent inadvertent turning -arrows-.



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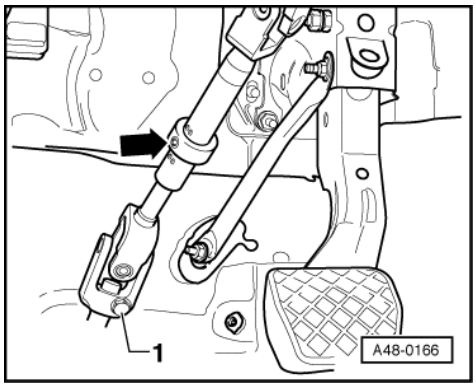
Left-hand drive vehicles:

- -> Unscrew plastic nuts -1- and take out cover -A-.



Right-hand drive vehicles:

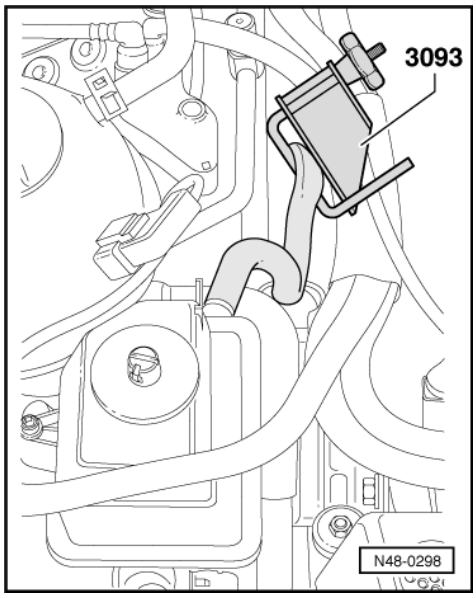
- -> Remove footrest -arrows-.



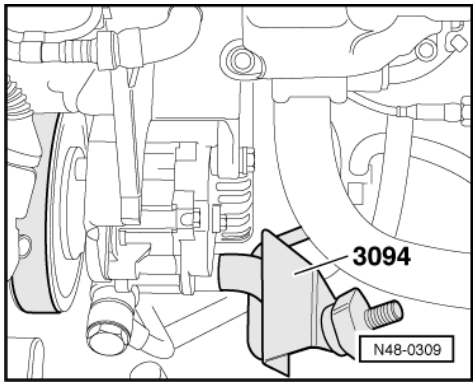
All models:

- -> Screw out bolt -1-.
- On vehicles with clamping ring -arrow-, slacken off hexagon socket-head bolt until mesh section can be compressed.
- Detach universal joint from steering box.

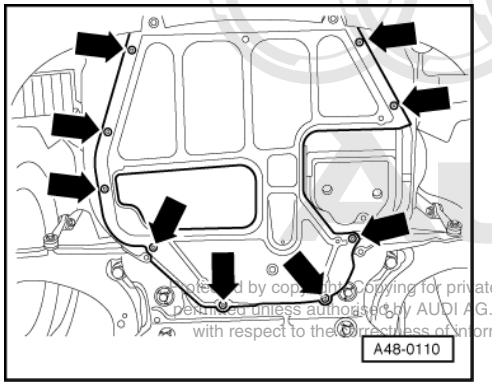
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- -> Pinch off hose from reservoir with hose clamp 3094.

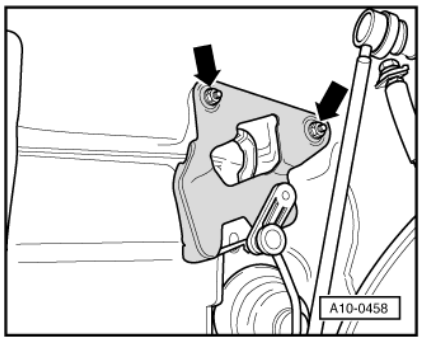


- -> Pinch off hose at vane pump with hose clamp 3094.

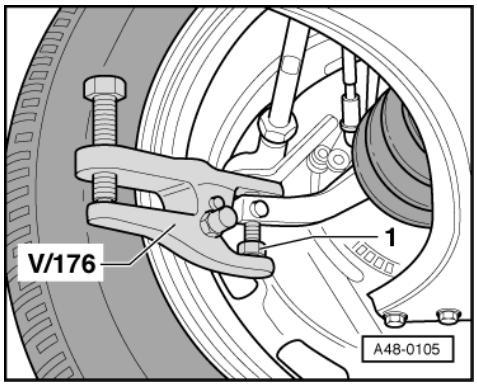


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- -> Detach noise insulation -arrows-.



- -> On vehicles with automatic headlight range control, unscrew bracket for headlight range control unit at top left of wheel housing -arrows-.

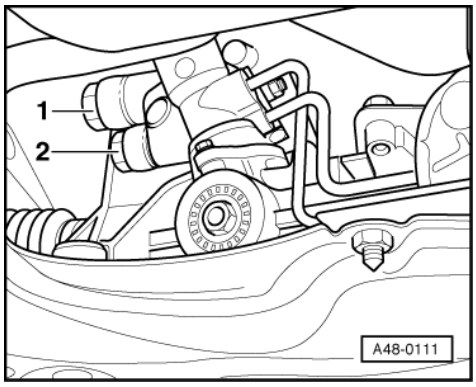


- Unscrew nut from track rod end.

Notes:

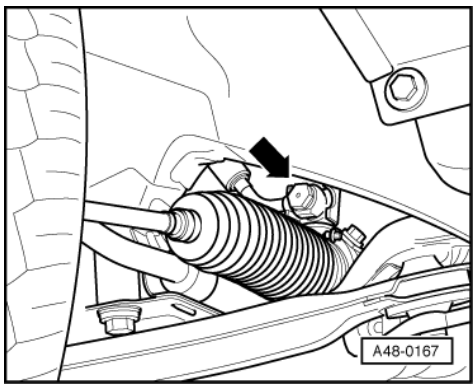
- Leave nut screwed several turns onto track rod end to protect thread.
- Fig. shows Audi A3 vehicle.

- -> Use puller Matra V/176 -Item 1- to press track rod off steering arm.



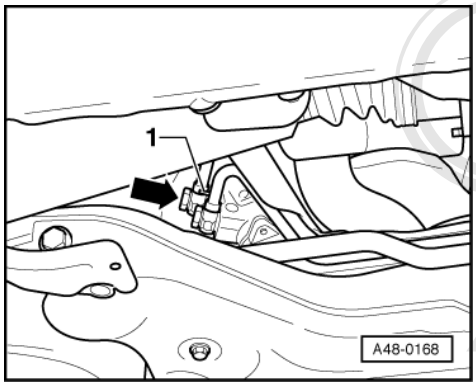
Left-hand drive vehicles:

- Place drip tray in position.
- -> Unscrew expansion hose -2- from steering box and seal off with a plastic bag and adhesive tape.
- Seal tapped hole at steering box (using plastic plug for example).
- Return pipe -1- can be unscrewed after lowering subframe.



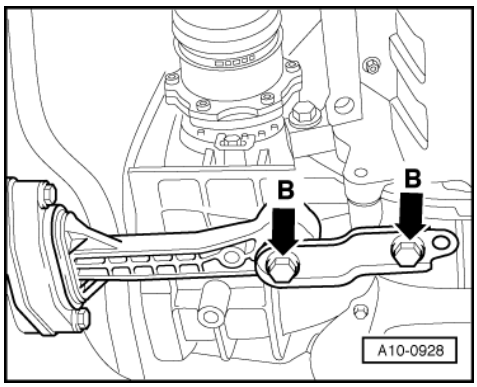
Right-hand drive vehicles:

- Place drip tray in position.
- -> Unscrew expansion hose -arrow- from steering box and seal off with a plastic bag and adhesive tape.



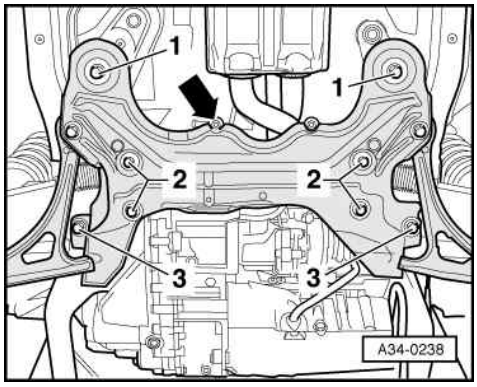
- -> Unscrew return pipe -arrow- from steering box and seal off with a plastic bag and adhesive tape.
- Seal tapped hole at steering box (using plastic plug for example).

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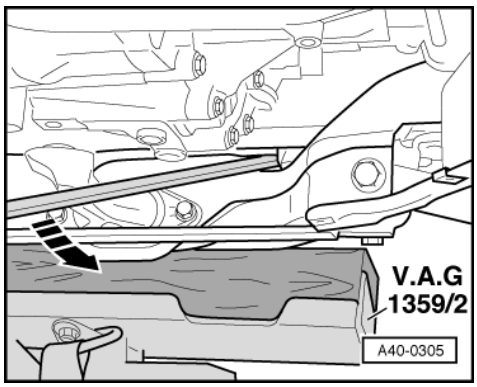


All models:

- -> Unscrew pendulum support at gearbox -arrows B-.

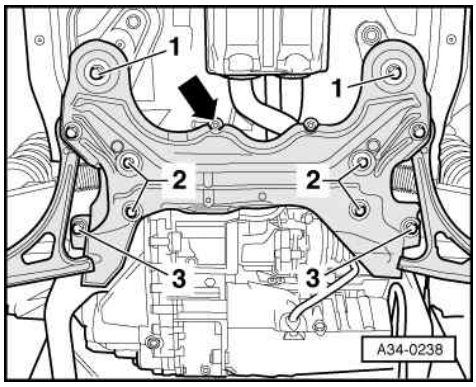


- -> If fitted, disengage rubber mount at front exhaust pipe -arrow-.
- Slacken off bolts -2- for steering box by several turns.



- -> Prise steering box off subframe (dowel sleeve) -arrow-.
- Unscrew holder for power steering pressure pipe on left of subframe.
- Position engine/gearbox lifter V.A.G 1383 A with universal mount V.A.G 1359/2 and wooden block beneath subframe.

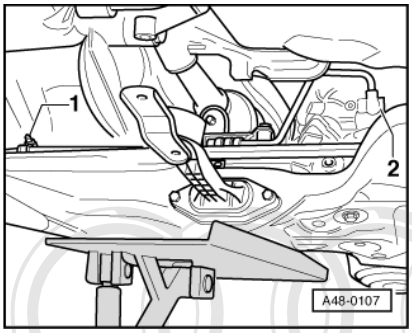
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- -> Screw out bolts -1- and -3- for subframe.
- Carefully lower subframe slightly.

Note:

When lowering, pay attention to side noise insulation and holder for hydraulic pipes on left side.



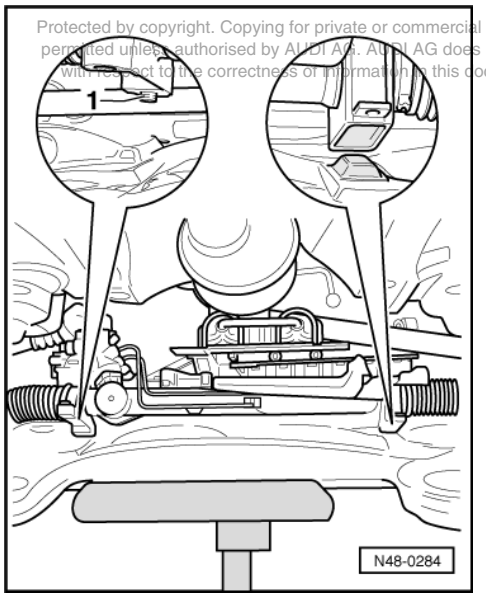
Left-hand drive vehicles:

- -> Unscrew return pipe from clamp -1- and unscrew rotary slide valve housing -2-.

All models:

- Screw out steering box bolts and take out steering box to rear.

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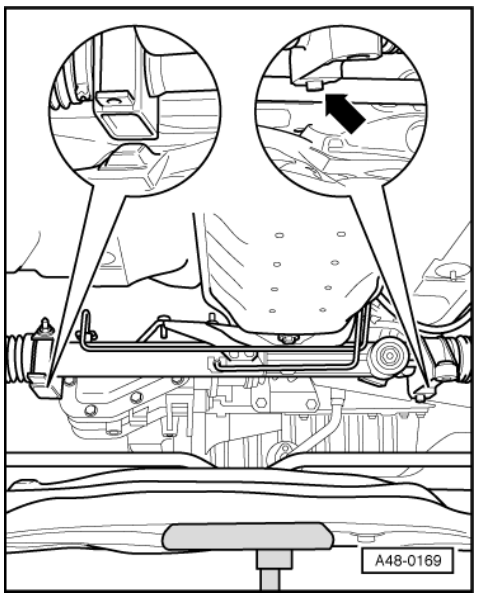
Installing

Note:

Use new sealing rings for hose/pipe connections.

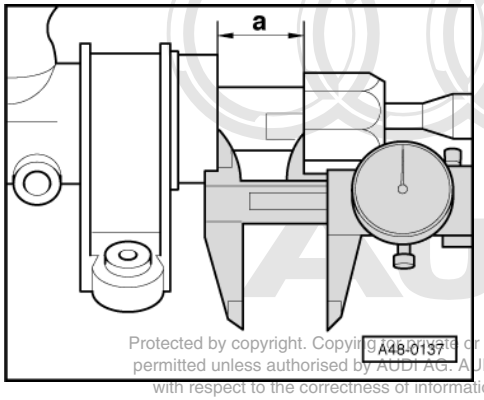
Left-hand drive vehicles:

- Position steering box on subframe and fit steering box bolts.
- -> Threaded sleeve -1- must be positioned in hole in subframe
- Rubber insert on opposite side must be positioned on corresponding projection on subframe



Right-hand drive vehicles:

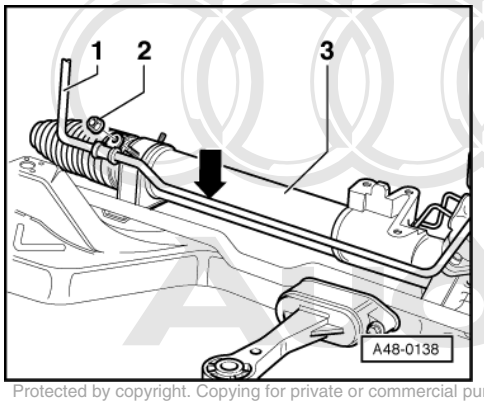
- Position steering box on subframe and fit steering box bolts.
- -> Threaded sleeve -arrow- must be positioned in hole in subframe
- Rubber insert on opposite side must be positioned on corresponding projection on subframe



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All models:

- -> Dimension -a- must be checked to ensure that steering box is in centre position.
- Take measurement on left of steering box for LHD/on right of steering box for RHD.
  - Audi A3: Dimension a = 30.5 mm
  - Audi S3: Dimension a = 33.5 mm
- Adjust by turning steering box pinion.



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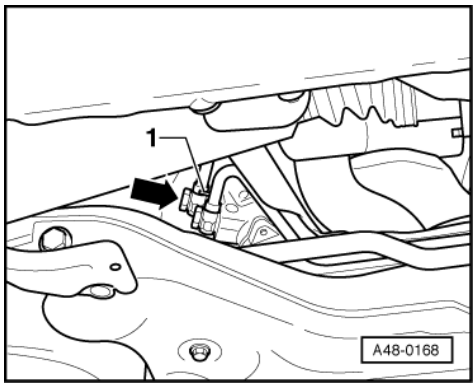
Left-hand drive vehicles:

- -> Screw return pipe to clamp at steering box.

Note:

On front-wheel drive vehicles, there must be a gap of 10 mm between return pipe -1- and steering box -3-.

- Screw return pipe with new sealing rings to rotary slide valve housing.



Right-hand drive vehicles:

- -> Screw return pipe with new sealing rings to rotary slide valve housing.

Note:

Make sure return pipe rests on locating pin -1-.

All models:

Note:

When securing pipes, make sure they cannot catch or become abraded.

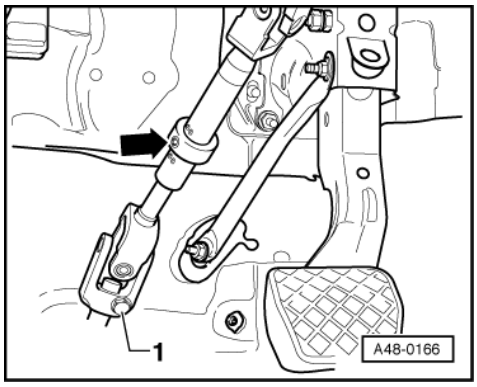
- Check correct positioning of sealing collar at steering box pinion.
- Raise subframe and, in doing so, guide steering box pinion into opening in floor of vehicle.

Perform further installation in reverse order, paying attention to the following:

- Install subframe => Page 52 .

- Insert track rods in steering arm. If joint pin rotates on tightening, provide support with Allen key (6 mm) or Torx socket wrench (T40).

- Do not attach universal joint of steering column to steering box pinion until vehicle is standing on ground and wheels are set to straight ahead position.



- -> Tighten bolt -1-.
- Tighten hexagon socket-head bolt on vehicles with clamping ring -arrow-.
- Top up hydraulic fluid - bleed steering system.

=> Maintenance

Tightening torques

Component	Nm
Universal joint to steering pinion	20 + 90° 1)2)
Clamping ring to steering column	17
Ball joint to wheel bearing housing	45 2)

1) 90°corresponds to quarter turn

2) Replace nuts/bolts

Perform wheel alignment after installation.

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3 - Vane pump

3.1 - Vane pump

Vane pump servicing work is not envisaged. Replace vane pump if fault is found.

In the event of problems, consult Fault Finding No. 10: Running Gear and employ pressure test and leak test to establish cause.

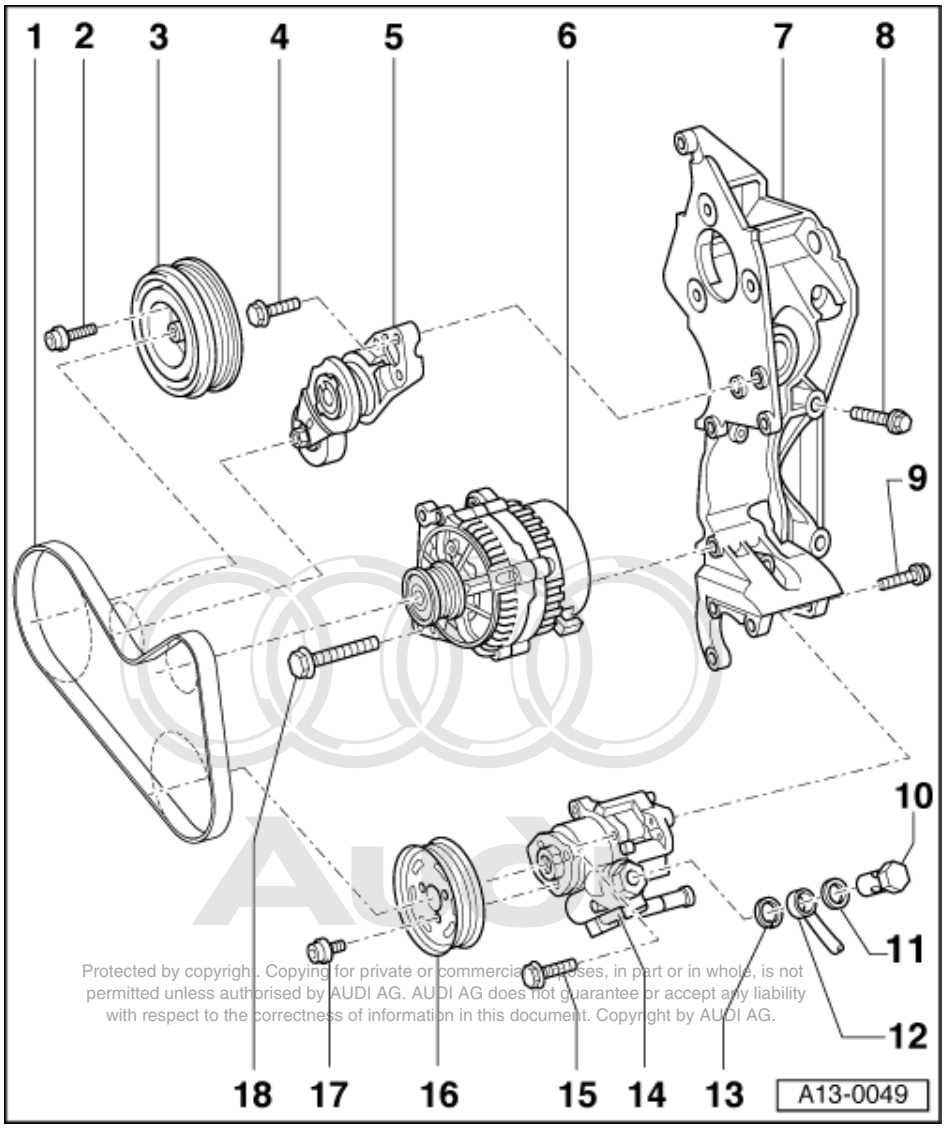
=> Service. Fault-Finding: Running Gear

Notes:

- Replacement pumps are supplied without fluid fill. Prior to installation they are therefore to be filled with hydraulic fluid G 002 000 and cranked by hand to avoid the possibility of noise whilst driving or pump damage.
- Quantity of fluid in system: 0.7 ... 0.9 l
- Do not re-use hydraulic fluid drained off.
- Replace sealing rings.

- Before removing, mark direction of ribbed belt with chalk or felt-tipped pen. Running a used belt in the opposite direction could destroy it.

3.2 - Exploded view for bottom-mounted vane pump



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Note:

The illustration shows the belt drive for vehicles with no air conditioner.

1 Ribbed belt

- Engines with air-conditioner compressor feature a double ribbed belt
- Removing and installing

=> Engine, Mechanics; Repair Group 13

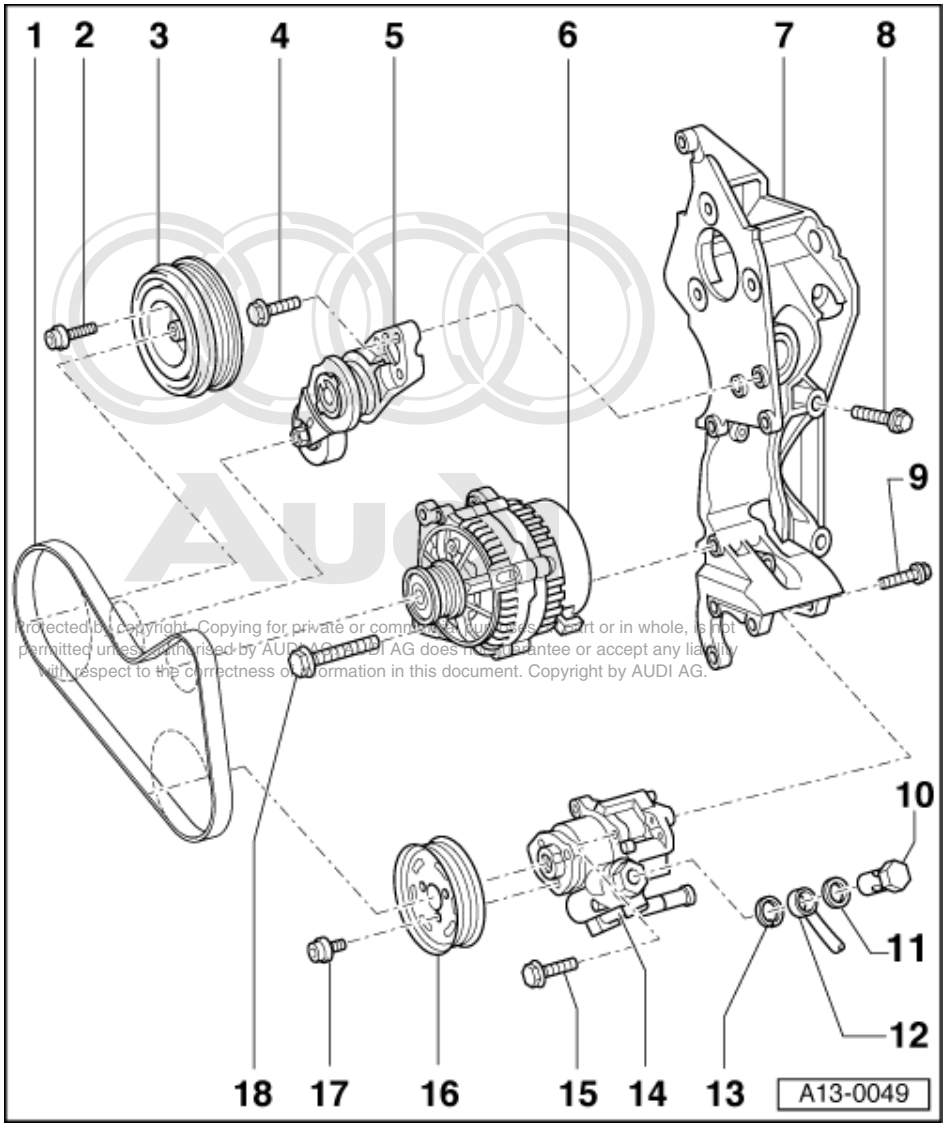
2 Special bolt

=> Parts List

- Bolt strength 8.8: Replace bolt and tighten to 10 Nm + 90°

- Bolt strength 10.9: Tighten to 40 Nm

3 Vibration damper



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4 Bolt, 23 Nm
5 Tensioner for ribbed belt
6 Alternator
7 Bracket for ancillaries
- Illustrated for vehicles without air-conditioner compressor

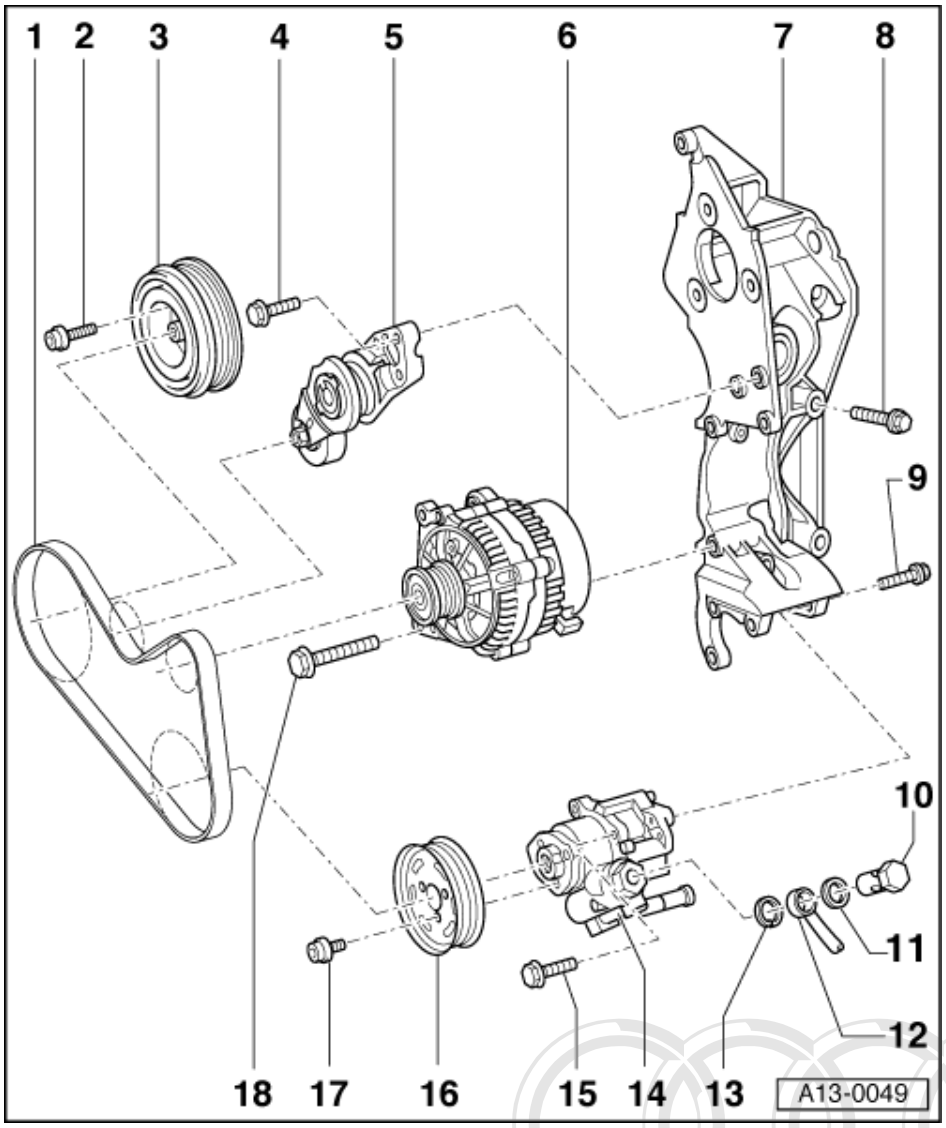
8 Bolt, 45 Nm
- Tightening sequence

=> Engine, Mechanics; Repair Group 13

9 Bolt, 23 Nm
10 Banjo bolt, 38 Nm
- Certain engines and design versions feature power-assisted steering pressure switch -F88 =>Fig. 1

11 Sealing ring
- Replace

12 Pressure pipe



13 Sealing ring

- Replace

14 Vane pump

- For power steering
- Checking delivery pressure
  => Page 335
- Removing and installing
  => Page 343
- To facilitate positioning of vane pump, drive back threaded bush for retaining bolt at bracket slightly

15 Bolt, 23 Nm

16 Pulley

- For vane pump

17 Bolt, 23 Nm

18 Bolt, 23 Nm

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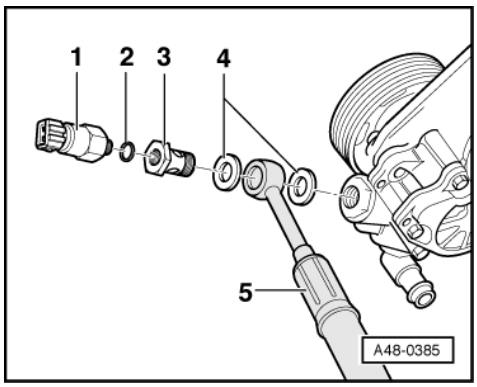


Fig.1 Power-assisted steering pressure switch -F88

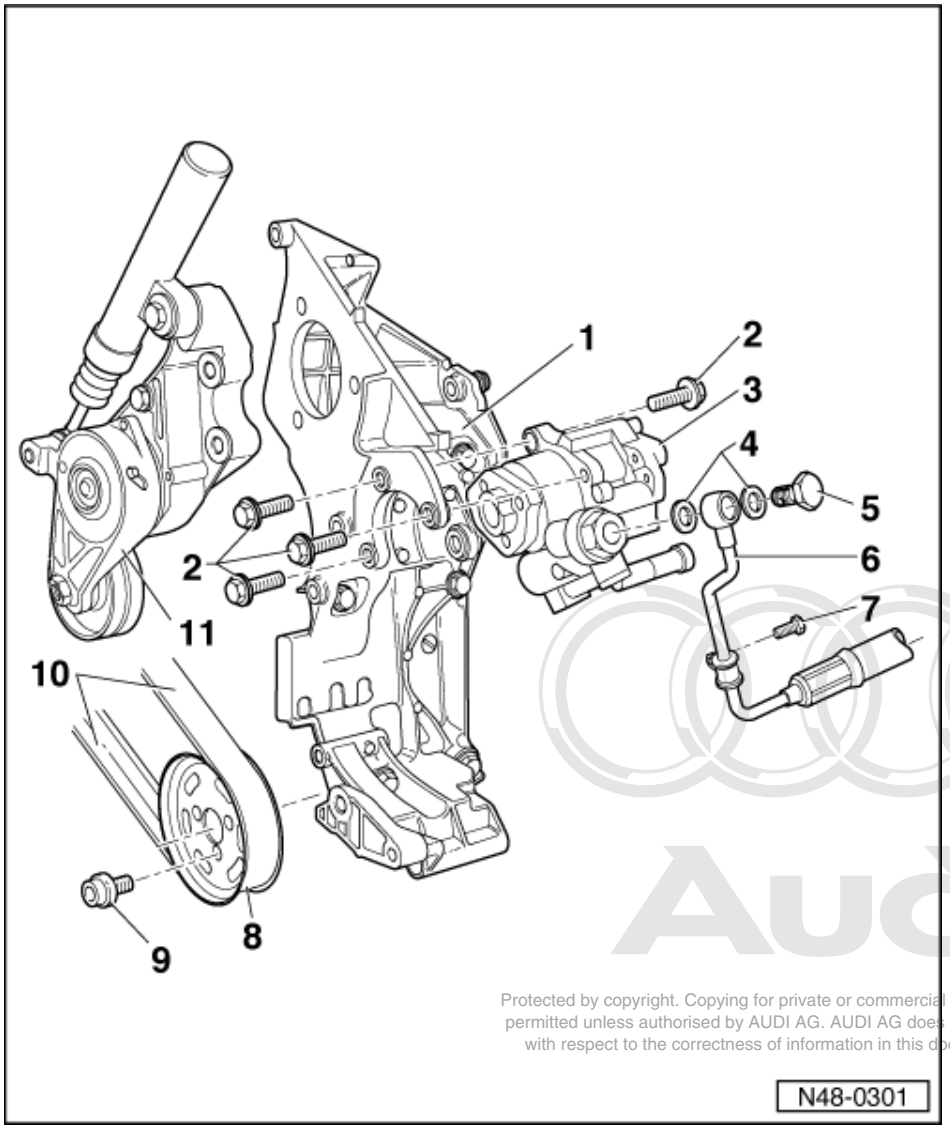
1 - Power-assisted steering pressure switch -F88
-Tightening torque 15 Nm
-Checking

=> Injection and Ignition System; Repair Group 24

2 - Sealing ring
-Replace
3 - Banjo bolt, 38 Nm
4 - Sealing rings
-Replace
5 - Pressure pipe
-With expansion hose

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3.3 - Exploded view for top-mounted vane pump



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1 **Bracket for ancillaries**

2 **Bolt, 23 Nm**

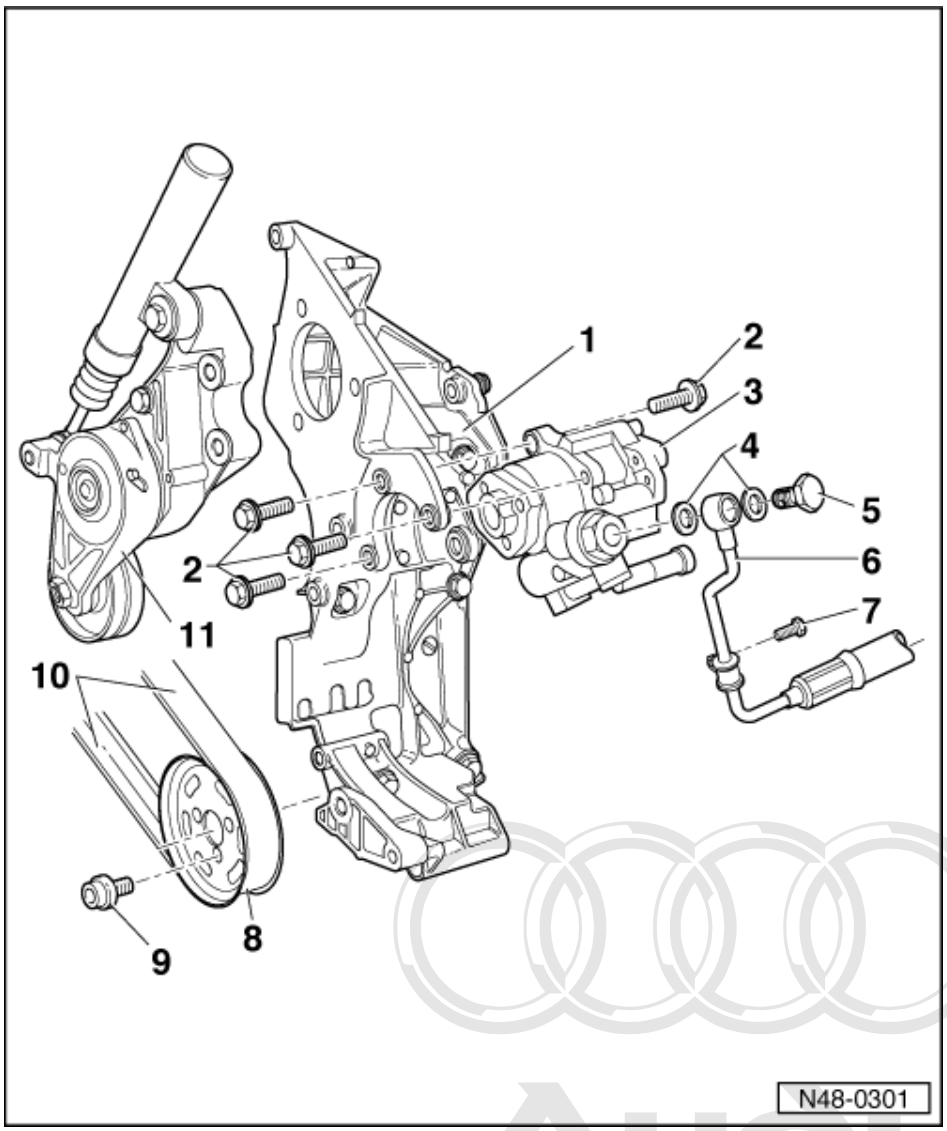
3 **Vane pump**

- Checking delivery pressure
  => Page 335
- Removing and installing
  => Page 348
- To facilitate positioning of vane pump, drive back threaded bush for retaining bolt at bracket slightly

4 **Sealing rings**

- Always replace after removing

5 **Banjo bolt, 38 Nm**



6 Pressure pipe

7 Bolt, 22 Nm

8 Pulley

- For vane pump

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9 Bolt, 23 Nm

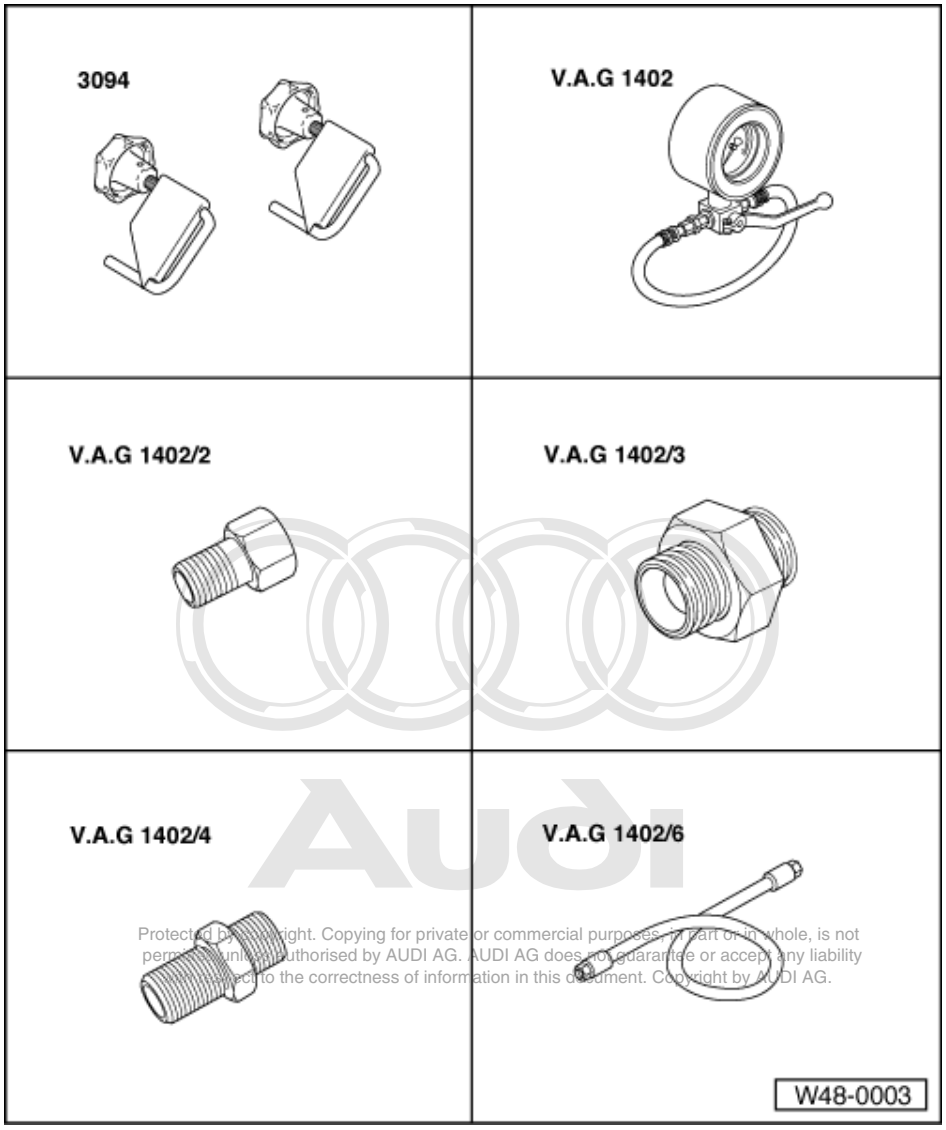
10 Ribbed belt

- Engines with air-conditioner compressor feature a double ribbed belt
- Removing and installing

=> Engine, Mechanics; Repair Group 13

11 Tensioner for ribbed belt

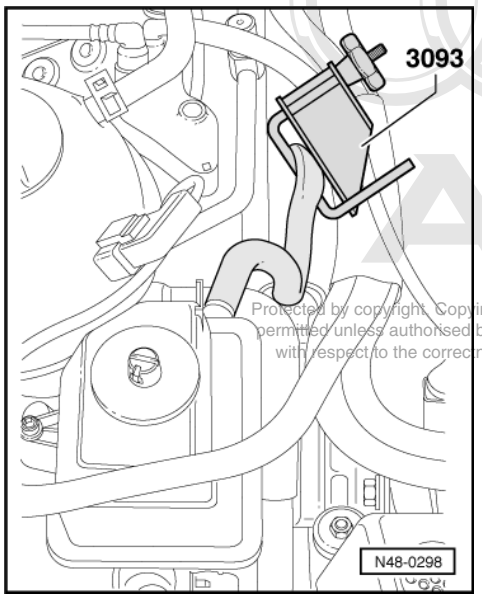
3.4 - Checking delivery pressure of vane pump



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Special tools and workshop equipment required

- Hose clamps 3094
- V.A.G 1402 Power steering tester
- V.A.G 1402/2 Adapter
- V.A.G 1402/3 Adapter
- V.A.G 1402/4 Adapter
- V.A.G 1402/6 Hose from adapter set
- Drip tray



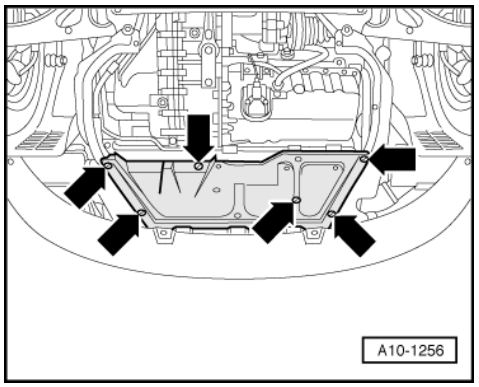
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Vehicles with bottom-mounted vane pump

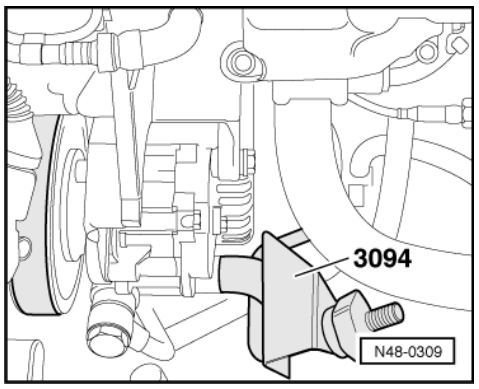
Test requirements:

- Ribbed belt tension OK
- No leaks in system
- Hoses/pipes not kinked or constricted

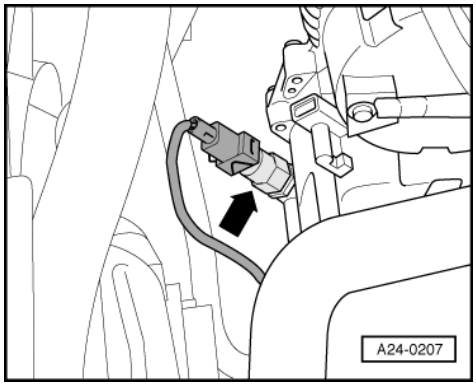
- -> Use hose clamp 3094 to pinch off return pipe.



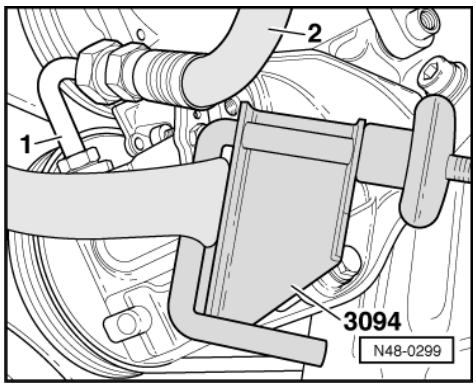
- -> Remove centre noise insulation -arrows-.



- Place drip tray beneath vane pump.
- -> Use hose clamp 3094 to pinch off suction pipe.



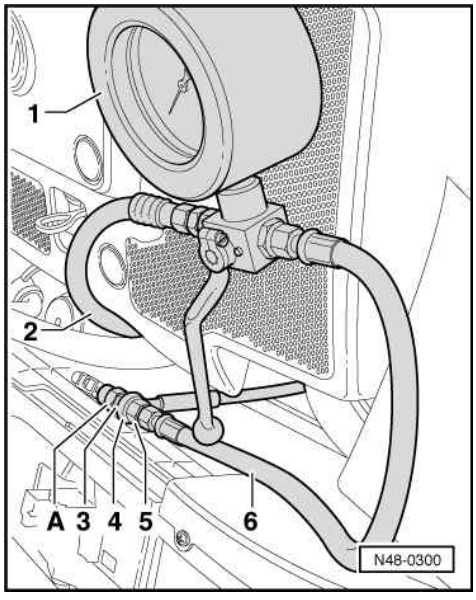
- -> Unplug connector on vehicles with power-assisted steering pressure switch -F88.
- Unscrew power-assisted steering pressure switch -F88 -arrow- and banjo bolt.



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- -> Screw adapter V.A.G 1402/1 -Item 1- with new sealing ring into vane pump connection.

2 - Hose from adapter set V.A.G 1402/6



- -> Connect up pressure gauge V.A.G 1402 -Item 1-.

A - Power-assisted steering pressure switch -F88
-Featured by certain engines and design versions
2 - V.A.G 1402/6 Hose from adapter set

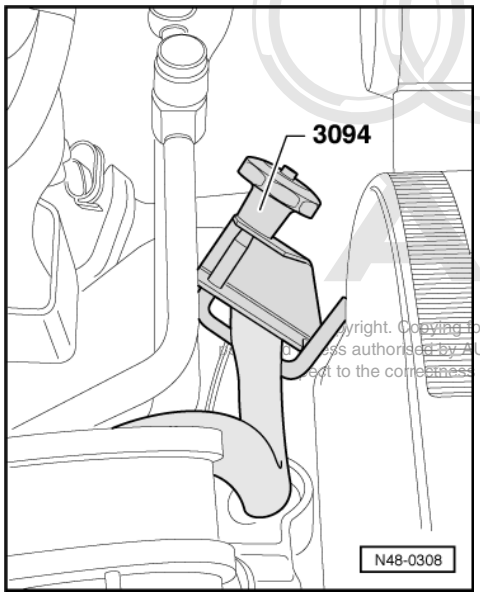
3 - Banjo bolt
4 - Banjo union of pressure hose
5 - V.A.G 1402/2
6 - V.A.G 1402 Hose of pressure gauge

- Detach hose clamp 3094 from suction and return pipes.
- Start engine and, if necessary, top up fluid level in reservoir.

- Turn steering wheel roughly 10 times from lock to lock.
- Then check delivery pressure.
- With engine idling, close shutoff valve (max. 5 seconds) and take pressure reading.
  - Specification for petrol engines: 85 ... 95 bar
  - Specification for TDI engines: 95 ...105 bar
  - Specification for Audi S3: 110 ...120 bar

Notes:

- If reading drops below or exceeds specification, replace pump
  => Page 343 .
- Always check steering system for leaks in the event of a lack of fluid in the reservoir.
- If a leak is found in the area of the steering pinion, start by checking pipes/pipe connections for leaks, re-tighten if necessary and wipe dry.
- Replace steering box in the event of leakage at steering pinion sealing ring or rack seal in steering box housing.
- To check rack seal, unfasten hose clamp of bellows and push bellows to one side.



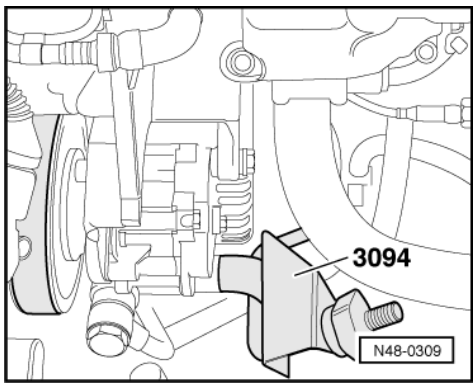
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Vehicles with top-mounted vane pump

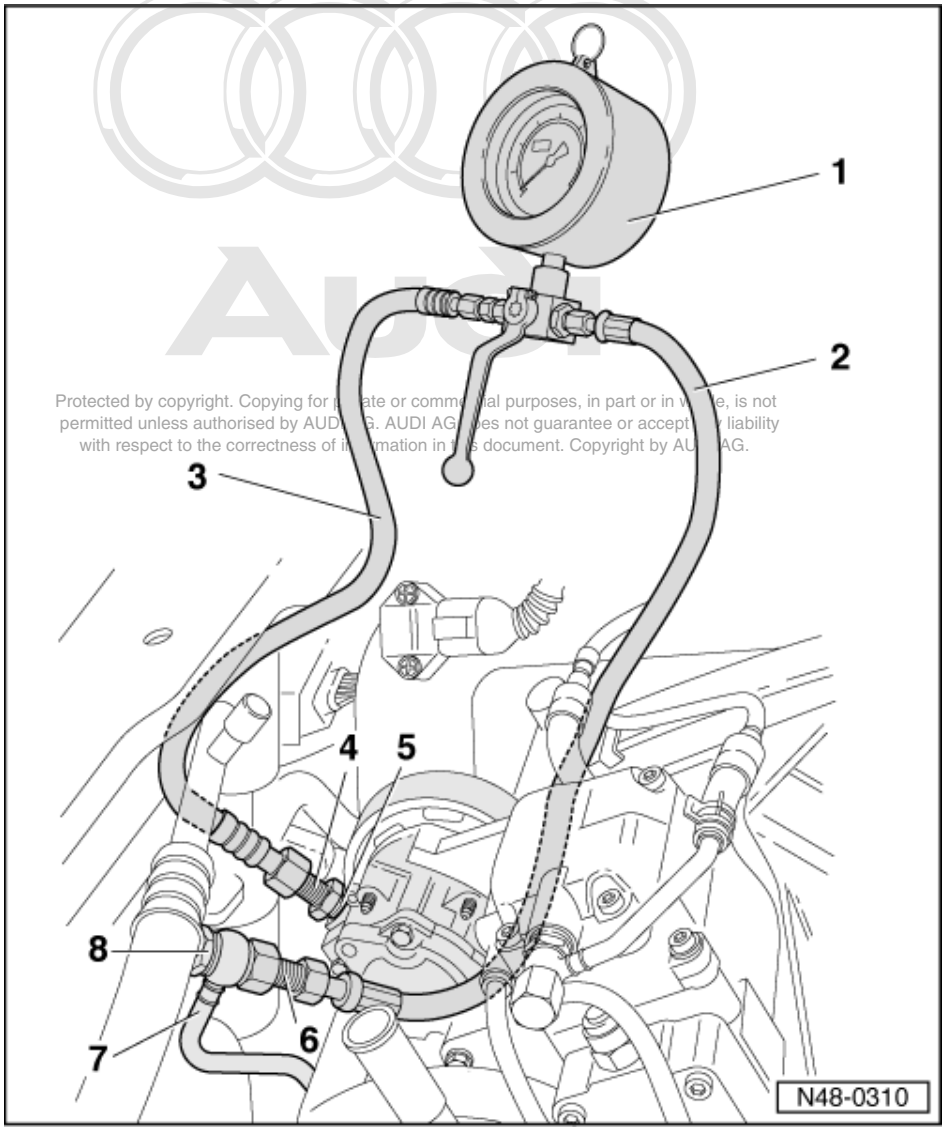
Test requirements:

- Ribbed belt tension OK
- No leaks in system
- Hoses/pipes not kinked or constricted

- -> Use hose clamp 3094 to pinch off return pipe.



- -> Use hose clamp 3094 to pinch off suction pipe.
- Place drip tray beneath vane pump.
- Unscrew pressure pipe from pump.



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- Connect up pressure gauge V.A.G 1402 as shown.

1 Pressure gauge V.A.G 1402
2 Hose from V.A.G 1402
3 Hose from adapter set V.A.G 1402/6
4 Adapter V.A.G 1402/4

5 Sealing rings
- 2x

6 Adapter V.A.G 1402/2

7 Pressure pipe
- With banjo union

8 Banjo bolt

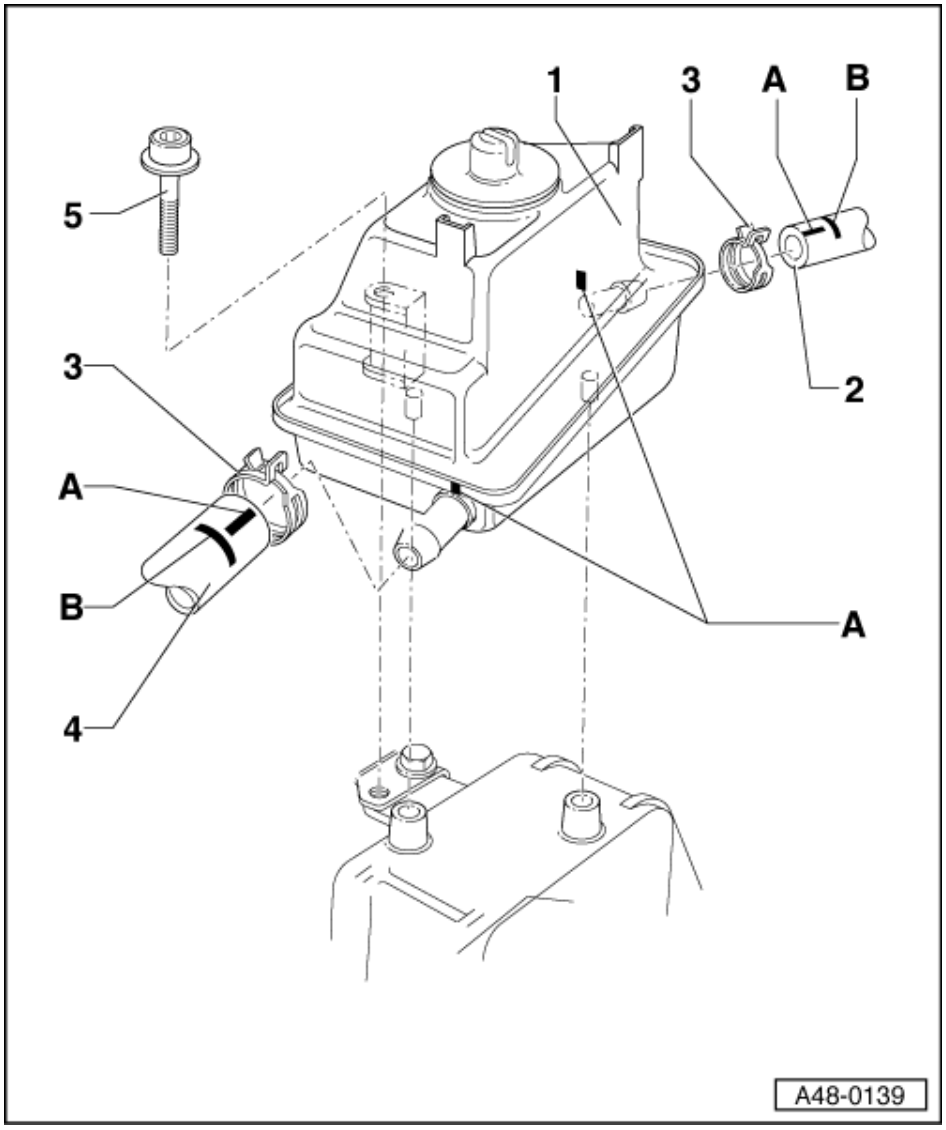
- Detach hose clamp 3094 from suction and return pipes.
- Start engine and, if necessary, top up fluid level in reservoir.
- Turn steering wheel roughly 10 times from lock to lock.
- Then check delivery pressure.
- With engine idling, close shutoff valve (max. 5 seconds) and take pressure reading.
  - Specification: 95 .. 105 bar

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Notes:

- If reading drops below or exceeds specification, replace pump
  => Page 348 .
- Always check steering system for leaks in the event of a lack of fluid in the reservoir.
- If a leak is found in the area of the steering pinion, start by checking pipes/pipe connections for leaks, re-tighten if necessary and wipe dry.
- Replace steering box in the event of leakage at steering pinion sealing ring or rack seal in steering box housing.
- To check rack seal, unfasten hose clamp of bellows and push bellows to one side.

3.5 - Exploded view: Fluid reservoir



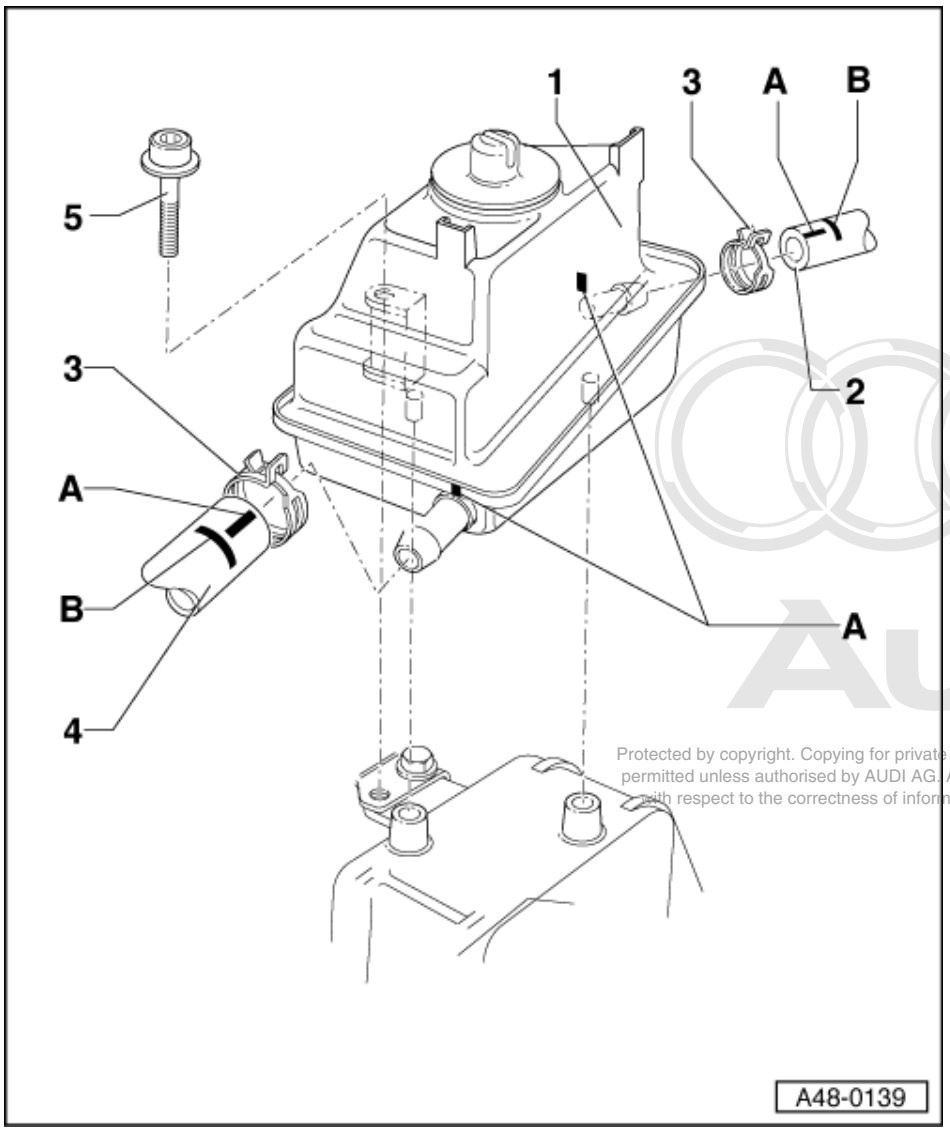
1 Fluid reservoir with screw cap

- Insert screwdriver, for example, crosswise to open cap
- Read off fluid level on screw cap dipstick with engine warm but not running
- Screw in cap and then read off fluid level

2 Return pipe

- From power-assisted steering box
- Longitudinal marks -A- must be aligned
- Spring clip should not be fitted beyond transverse mark -B- on hose

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3 Spring clip

- Use special tool V/131 for unfastening and fastening
- Eyelets must face upwards

4 Suction hose

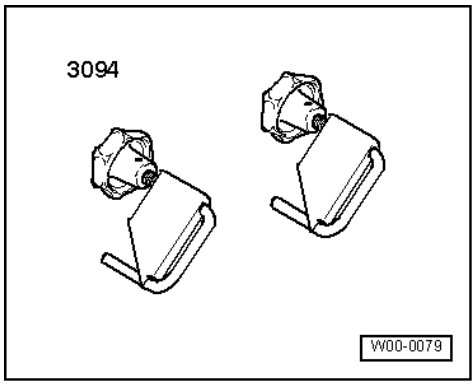
- From vane pump
- Longitudinal marks -A- must be aligned
- Spring clip should not be fitted beyond transverse mark -B- on hose

5 Combi bolt, 10 Nm

4 - Removing and installing vane pump

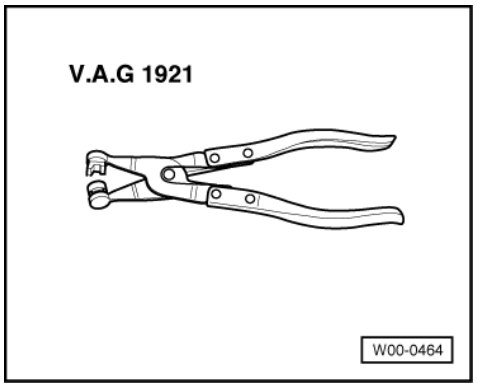
4.1 - Removing and installing vane pump

4.2 - Vehicles with bottom-mounted vane pump

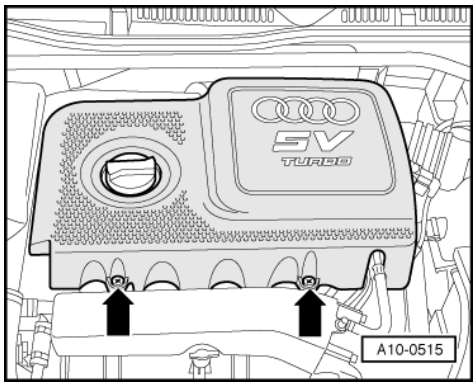


Special tools and workshop equipment required

- Hose clamps 3094



- Hose clamp pliers V.A.G 1921
- Drip tray



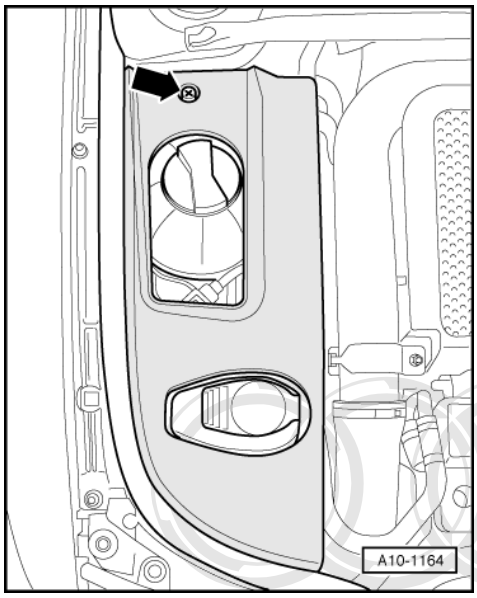
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Removing

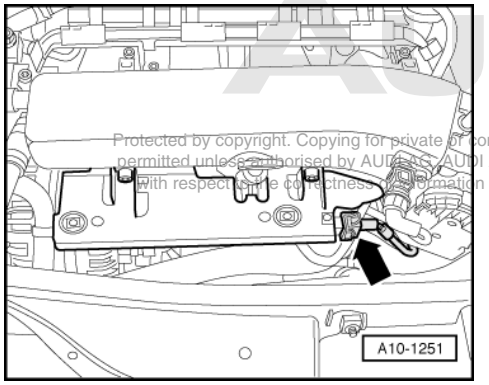
Note:

The following description relates to removal on Audi S3. Certain operations are not required for less powerful engines.

- -> Remove engine cover -arrows- and cover in front of intake manifold.

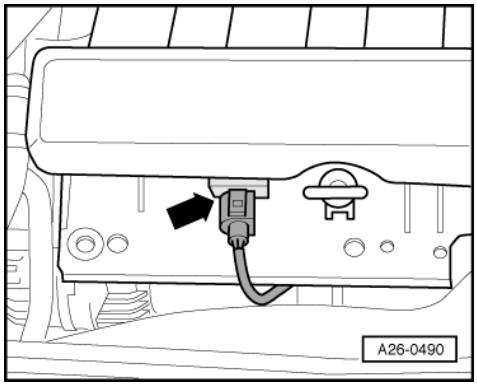


- -> Screw out bolt -arrow- and remove cover over expansion tank.

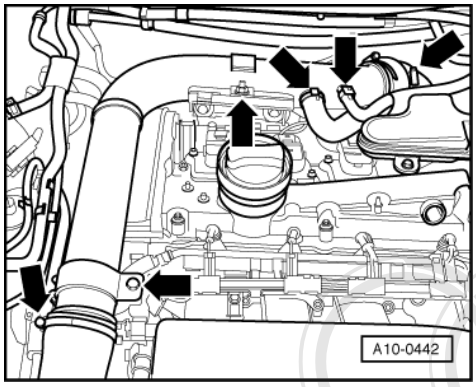


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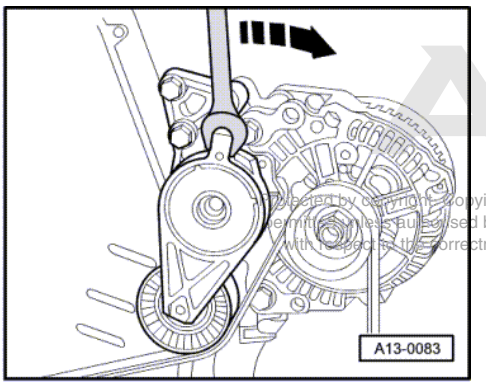
- -> If fitted, unplug connector at secondary-air inlet valve -N112 -arrow-.



- -> Unplug connector -arrow- at exhaust gas temperature sender 1 -G235.



- -> Remove air pipe -arrows-.

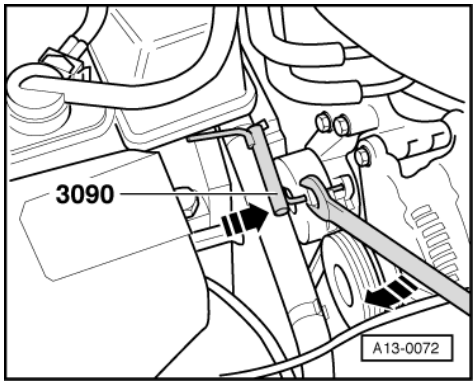


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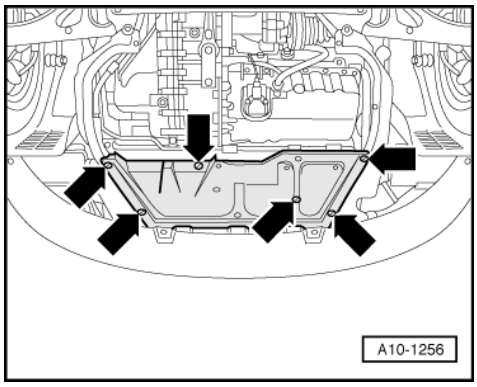
Note:

Before removing, mark direction of ribbed belt with chalk or felt-tipped pen. Running a used belt in the opposite direction could destroy it.

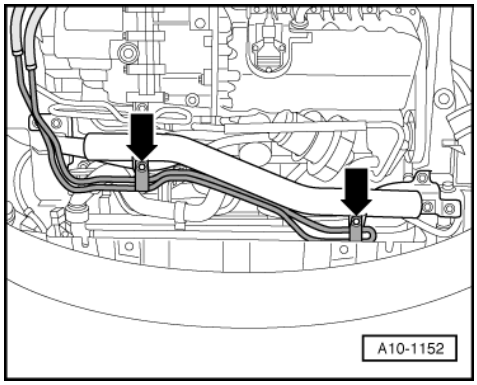
- -> Swivel tensioner in direction of arrow to slacken off ribbed belt.
- Detach ribbed belt.



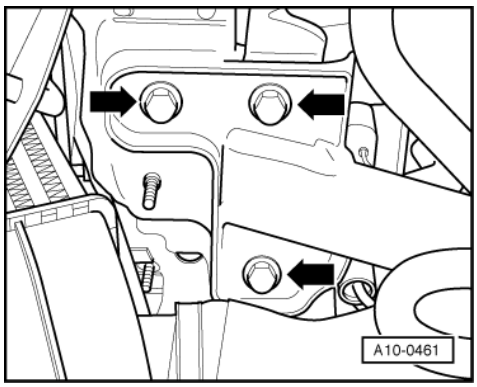
- -> Lock tensioner with mandrel ø4.5 mm, approx. 55 mm long, or using special tool 3090.



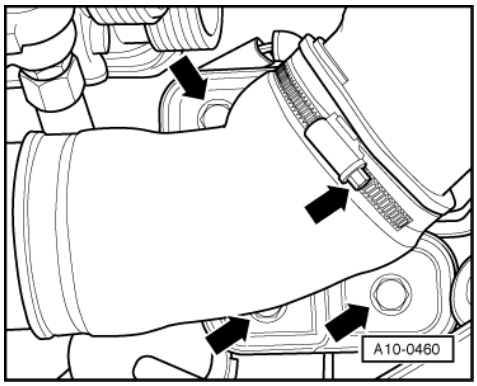
- -> Remove centre noise insulation -arrows-.



- -> Detach power steering pipe at cross-piece -arrows-.



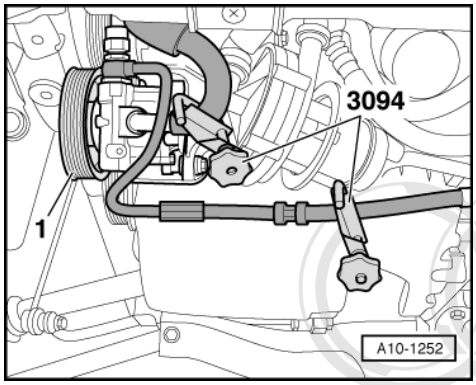
- -> Unscrew cross-piece on left...



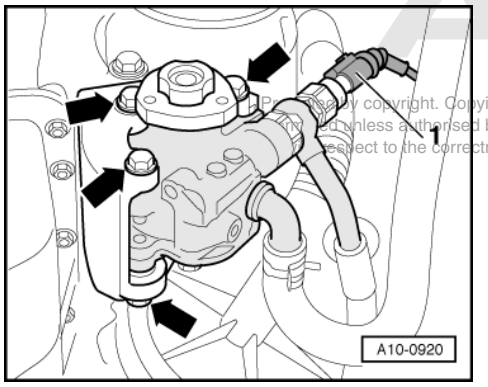
- -> ...and right from longitudinal members; unscrew both hoses to charge-air cooler.

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- Remove cross-piece.



- Place drip tray beneath vane pump.
- -> Unscrew pulley -1- of vane pump whilst providing support with mandrel.
- Use hose clamps 3094 to pinch off both hydraulic pipes to vane pump.



- -> Unplug connector -1- at power-assisted steering pressure switch -F88.
- Detach hydraulic hoses at vane pump.
- Unscrew vane pump from bracket -arrows-.

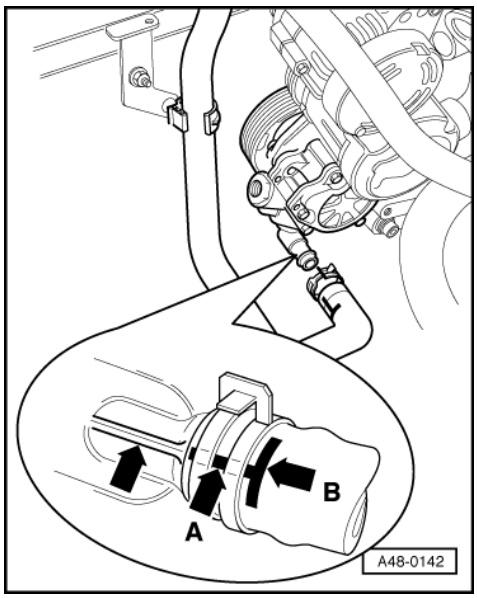
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Installing

Install in reverse order, paying attention to the following:

Notes:

- Replacement pumps are supplied without fluid fill. Prior to installation they are therefore to be filled with hydraulic fluid G 002 000 and cranked by hand to avoid the possibility of noise whilst driving or pump damage.
- Contact surfaces and threads on either side of vane pump must be free from paint.
- Hydraulic fluid drained off is not to be re-used.
- Replace sealing rings.

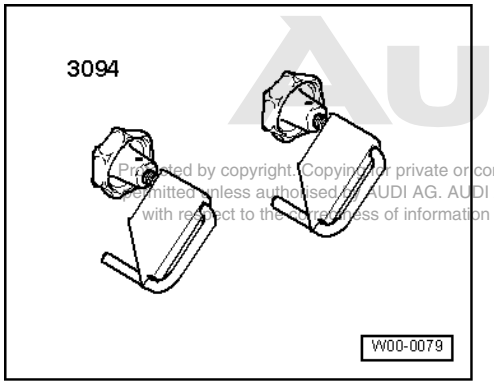


- -> Fit spring clip and suction hose as shown.
- Longitudinal mark -A- at suction hose must be aligned with seam at pump.
- Do not fit spring clip beyond transverse mark -B-.
- Install cross-piece => Page 65 .

Tightening torques

Component	Nm
Vane pump for power steering to bracket for ancillaries	23
Pulley to vane pump	23
Banjo bolt to vane pump	38
Pressure switch to banjo bolt	15

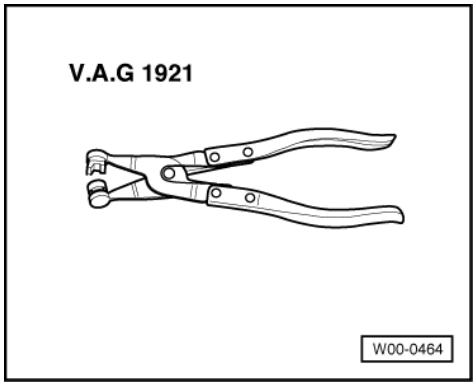
4.3 - Vehicles with top-mounted vane pump



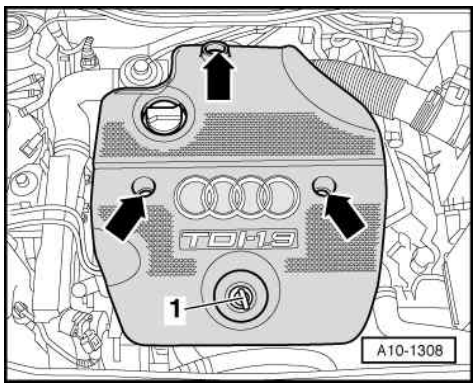
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Special tools and workshop equipment required

- Hose clamps 3094

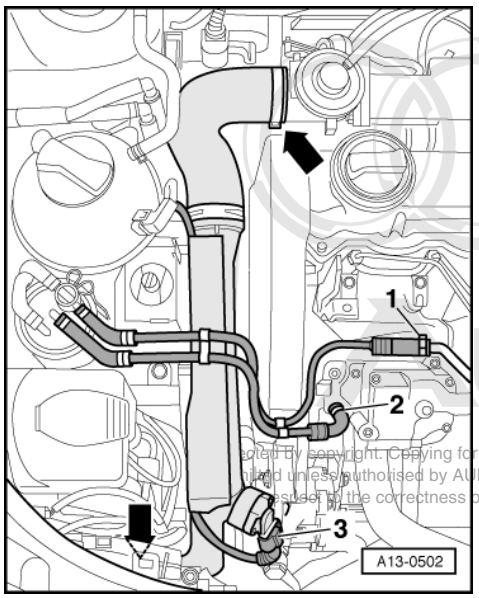


- Hose clamp pliers V.A.G 1921



Removing

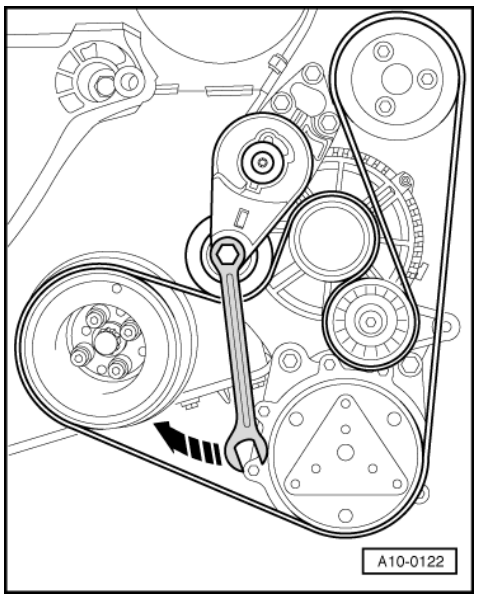
- -> Pull dipstick -1- out of guide tube.
- Unclip caps.
- Unfasten nuts -arrows- and detach engine cover.
- Re-insert dipstick in guide tube.



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- Detach cover and unplug connector at right headlight.
- -> Disconnect fuel supply pipe -2- and fuel return pipe -1- at injection pump.
- Unplug connector -3- at sender -G71/-G72.
- Lay bare wire at air pipe.

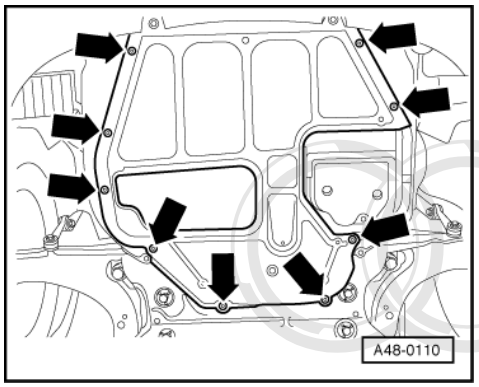
- Remove right air pipe -arrows-.



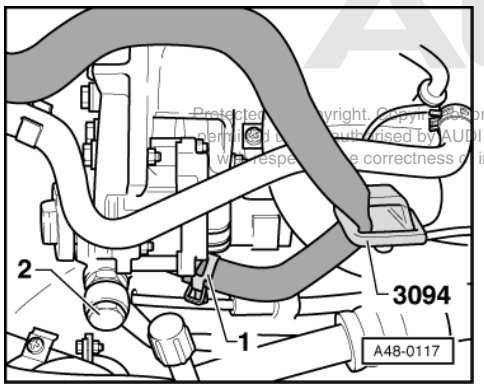
Note:

Before removing, mark direction of ribbed belt with chalk or felt-tipped pen. Running a used belt in the opposite direction could destroy it.

- Apply flat 16 mm box wrench at hexagon of tensioning roller.
- -> Swivel tensioner in direction of arrow to slacken off ribbed belt.
- Detach ribbed belt.

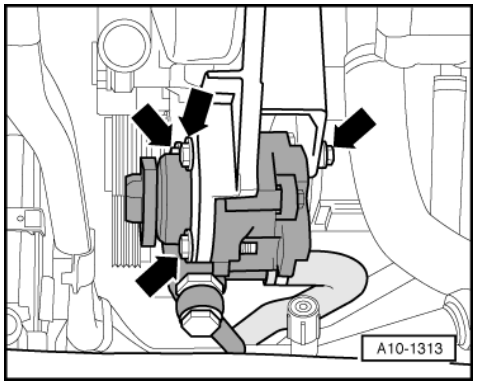


- -> Detach noise insulation -arrows-.



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- Place drip tray beneath vane pump.
- -> Use special tool -3094- to pinch off fluid reservoir/vane pump suction hose.
- Unfasten spring clip -1- and detach suction hose.
- Unscrew expansion hose -2-.



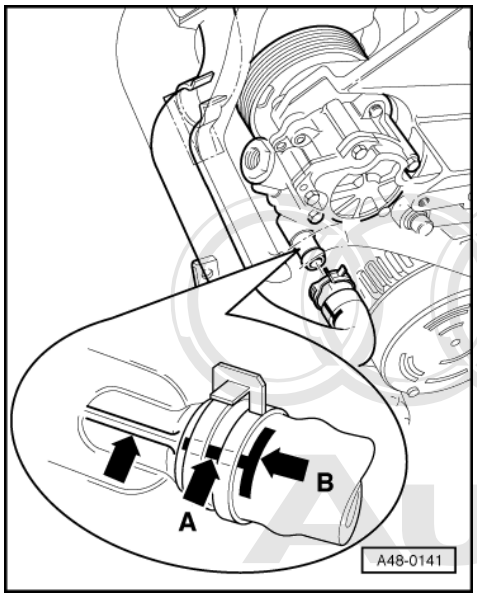
- Unscrew pulley of vane pump whilst providing support with mandrel.
- -> Unscrew power steering vane pump -arrows-. Leave wires connected.

Installing

Install in reverse order, paying attention to the following:

Notes:

- Replacement pumps are supplied without fluid fill. Prior to installation they are therefore to be filled with hydraulic fluid G 002 000 and cranked by hand to avoid the possibility of noise whilst driving or pump damage.
- Contact surfaces and threads on either side of vane pump must be free from paint.
- Hydraulic fluid drained off is not to be re-used.
- Replace sealing rings.



- -> Fit spring clip and suction hose as shown.
- Longitudinal mark -A- at suction hose must be aligned with seam at pump.
- Do not fit spring clip beyond transverse mark -B-.

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Tightening torques

Component	Nm
Vane pump for power steering to bracket for ancillaries	23

Component	Nm
Pulley to vane pump	23
Banjo bolt to vane pump	38

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