00-1

Technical data

Suspension

Models	Front Wheel Drive (FWD) All Wheel Drive (AWD)			
	Standard suspension (1BA) Special suspension (1BC)		Sport suspension (1BE)	
	FWD	AWD	FWD	AWD
Wheelbase mm (in.)	2622 (103.23)	2607 (102.64)	2619 (103.11)	2607 (102.64)
Front track mm (in.)	1495 (58.86)	1495 (58.86)	1498 (58.98)	1498 (58.98)
Rear track mm (in.)	1479 (58.23)	1475 (58.07)	1479 (58.23)	1477 (58.15)

Models	Front Wheel Drive (FWD) All Wheel Drive (AWD)			
	Heavy duty suspension (1BB)		Heavy duty suspension (1BT)	
	FWD	AWD	FWD	AWD
Wheelbase mm (in.)	2624 (103.23)	2607 (102.64)	2623 (103.27)	2607 (102.64)
Front track mm (in.)	1489 (58.62)	1489 (58.62)	1493 (58.78)	1493 (58.78)
Rear track mm (in.)	1479 (58.23)	1469 (57.83)	1479 (58.23)	1473 (57.99)

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Steering gear

Model	All
Steering	Power-assisted steering
Max. wheel angle	40 °
Turning circle diameter m (ft)	11.1 (43.7)

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40-1

Front axle components, locations

WARNING!

- ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

CAUTION!

- ***Do not attempt to weld or straighten the load-bearing components or parts of the suspension.***

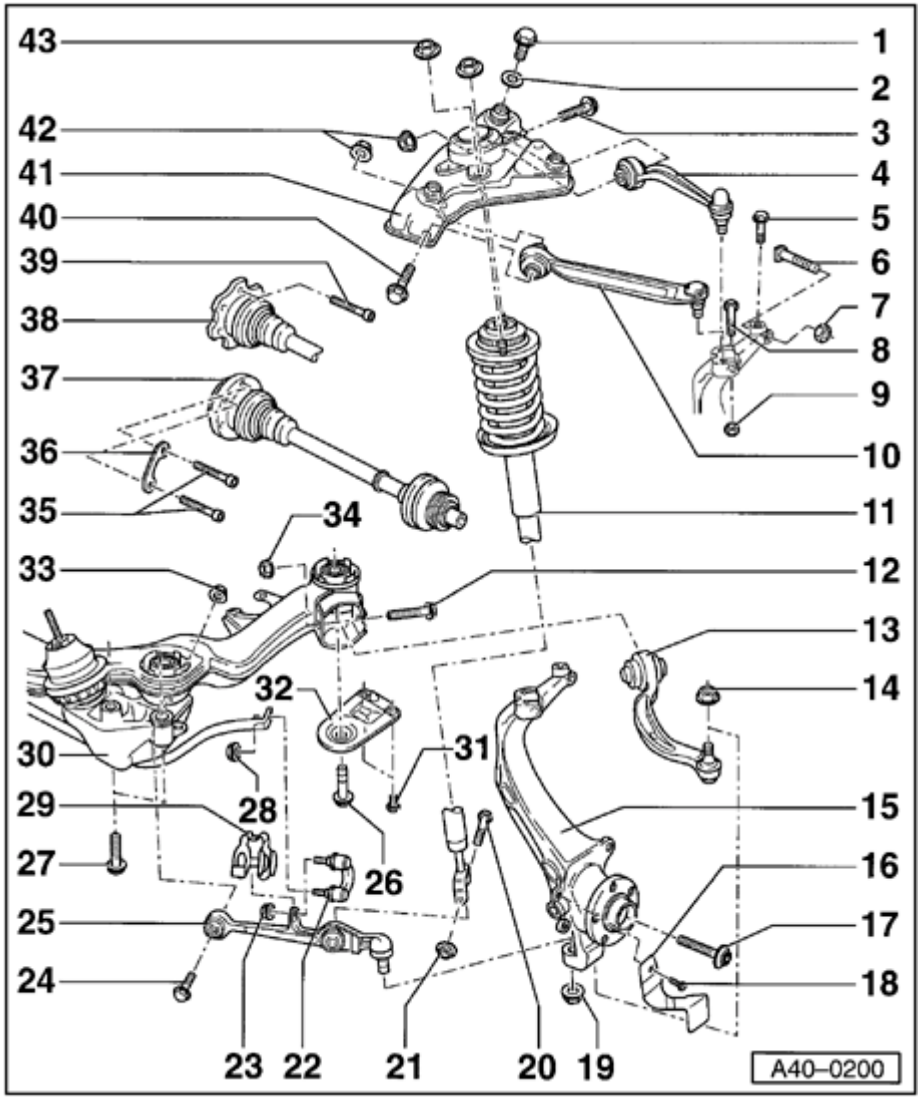
- ***Do not attempt to move a vehicle from which the drive axle has been removed. Otherwise wheel bearing damage will result. If the vehicle does have to be moved, install an outer CV joint in place of the drive axle and tighten to 50 Nm (37 ft lb).***

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- ***The bonded rubber bushings can only be turned to a limited extent. The bolted connections on the suspension links should therefore only be tightened when the vehicle is standing on the ground.***

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40-2



1 - Bolt

- ♦ 75 Nm (55 ft lb)

2 - Washer

3 - Bolt

- ♦ Always replace

Note different lengths:

- ♦ With steel mounting bracket: M10 x 60
- ♦ With aluminum mounting bracket: M10 x 62

4 - Upper link, rear

- ♦ Note different versions: with and without buffer stop ⇒ Figs. 1 and ⇒ 2
- ♦ Replacing bushing ⇒ page 40-75

5 - Bolt

- ♦ 7 Nm (62 in. lb)
- ♦ Tighten until firm contact is made

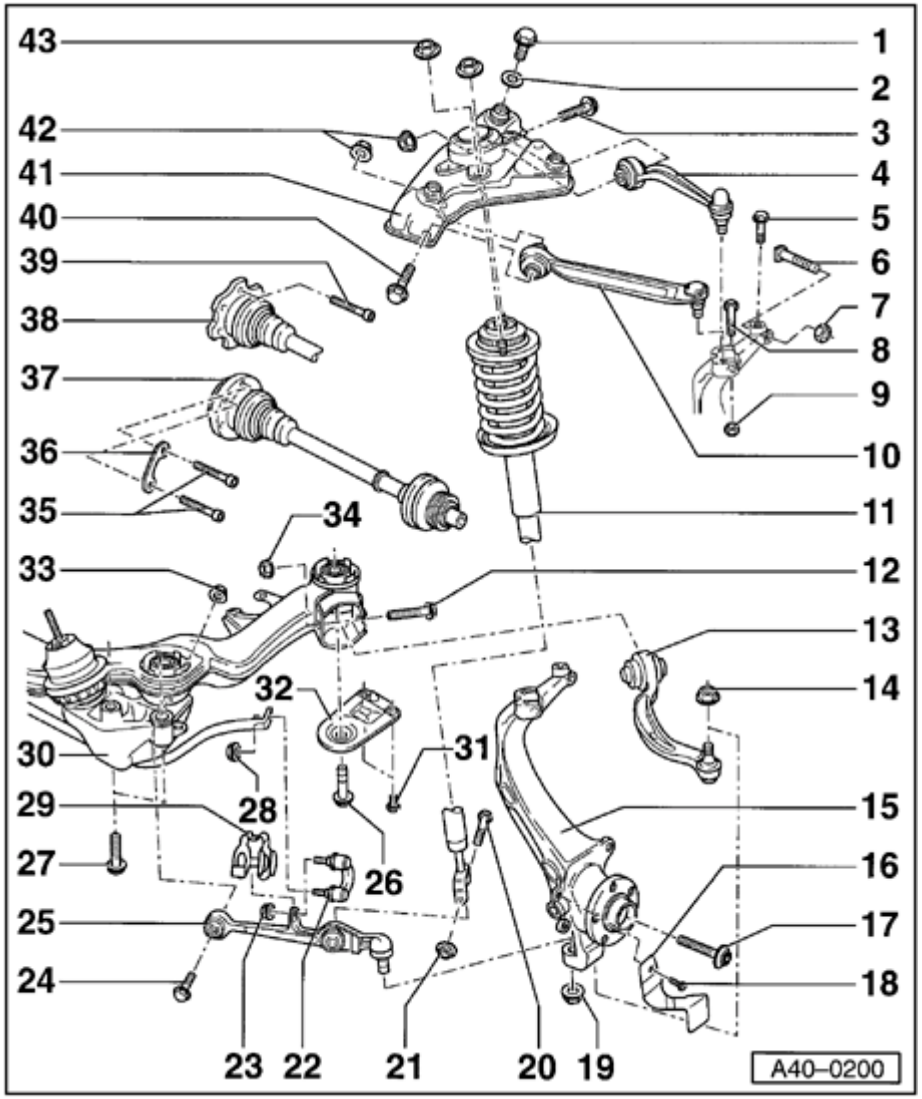
6 - Bolt

7 - Self-locking nut

- ♦ Always replace
- ♦ 50 Nm (37 ft lb)

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40-3



8 - Bolt M10 x 100

9 - Self-locking nut

- Always replace
- 40 Nm (30 ft lb)

10 - Upper link, front

- Remove together with mounting bracket
- Removing and installing mounting bracket ⇒ page 40-68
- Replacing bushing ⇒ page 40-75

11 - Suspension strut

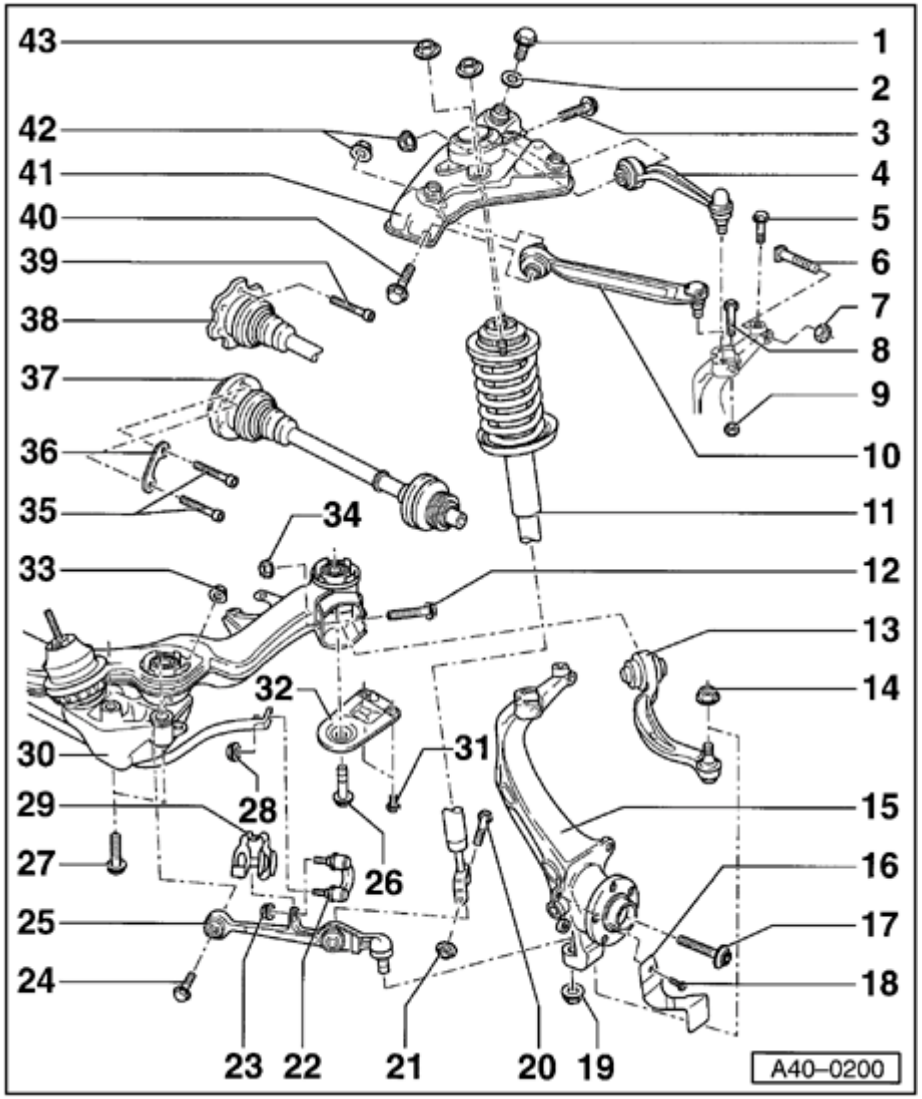
- Note different spring/shock absorber versions ⇒ vehicle data label, page 40-46
- Removing and installing ⇒ page 40-39
- Servicing ⇒ page 40-44

12 - Bolt w/washer M12 x 1.5 x 120

- Always replace

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40-4



13 - Guide link with hydraulic bushing

- Removing and installing ⇒ page 40-97
- Replace hydraulic bushing if leaking ⇒ page 40-99

14 - Self-locking nut

- Always replace
- 100 Nm (74 ft lb)

15 - Wheel bearing housing

- Removing and installing on vehicles with headlight range control ⇒ page 40-14
- Removing and installing ⇒ page 40-54
- Servicing ⇒ page 40-60

16 - Splash shield

17 - Collar bolt

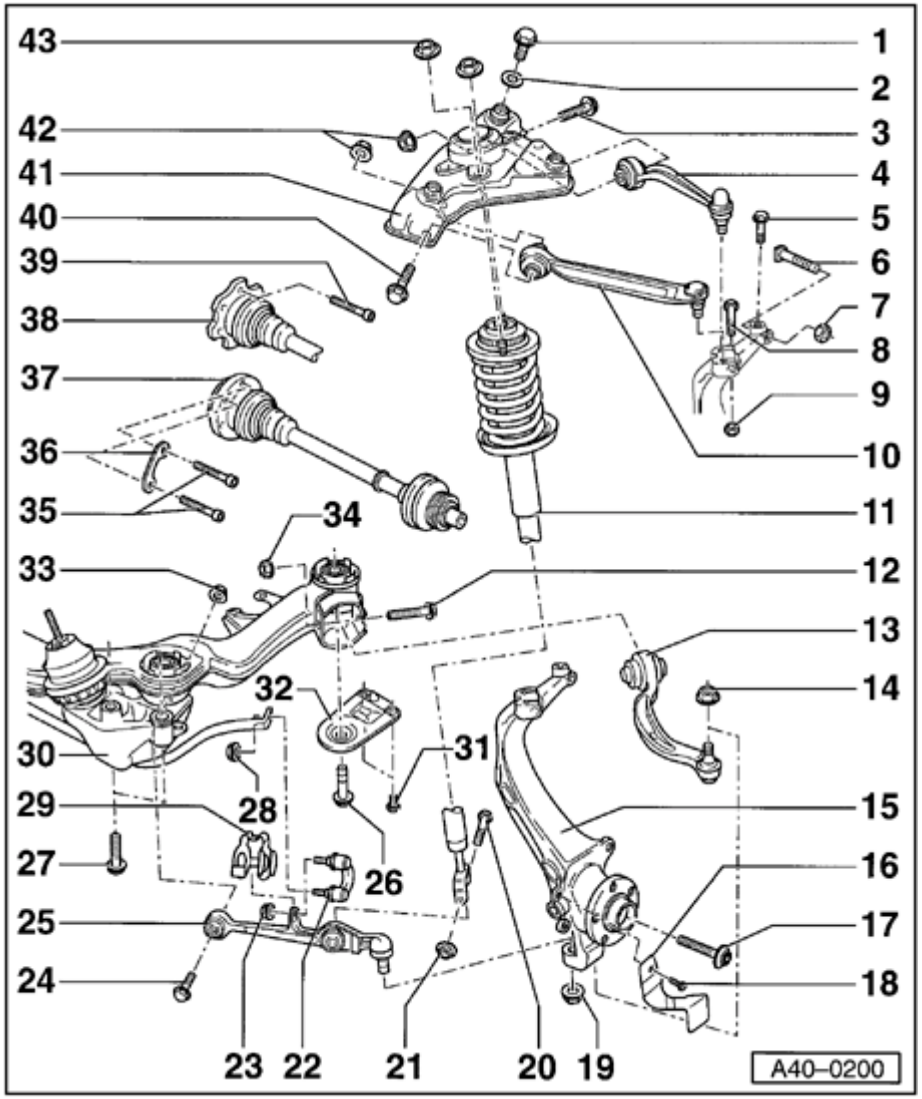
- Always replace
- When tightening, vehicle must be standing on its wheels

Tightening torques:

- M14: 115 Nm (85 ft lb) + 1/2-turn (180°)
- M16: 190 Nm (140 ft lb) + 1/2-turn (180°)

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40-5



18 - Bolt

- 10 Nm (7 ft lb)

19 - Self-locking nut

- Always replace
- 100 Nm (74 ft lb)

20 - Bolt M12 x 1.5 x 85

21 - Self-locking nut

- Always replace
- 90 Nm (66 ft lb)

22 - Connecting link

- Arrow faces direction of travel

23 - Self-locking nut

- Always replace
- 40 Nm (52 ft lb) + 1/4-turn (90°)
- Underside of nut is ribbed
- Replace only with exact same type of special nut

24 - Bolt M12 x 1.5 x 100

- Always replace

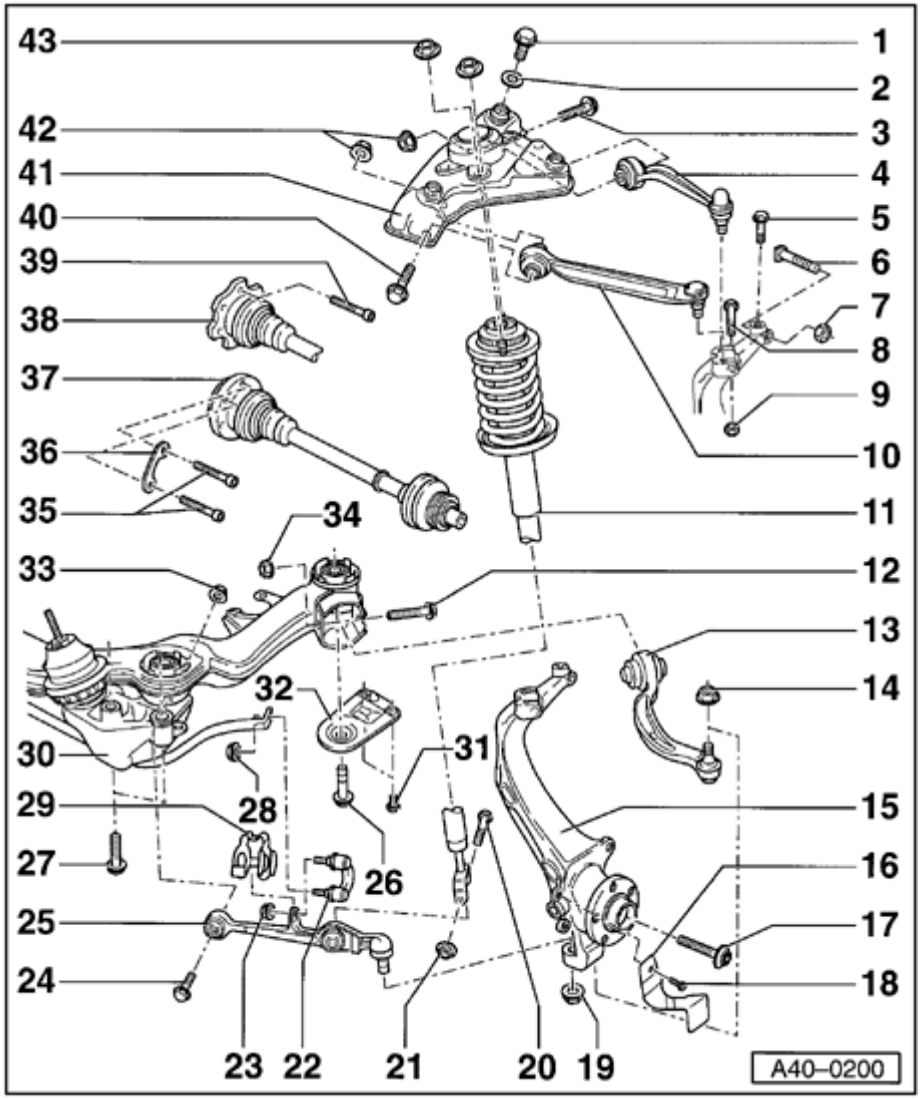
25 - Lower track control link

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- Removing and installing on vehicles with headlight range control ⇒ page 40-14
- Replacing bushing ⇒ page 40-94

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40-6



26 - Bolt M12 x 1.5 x 110

- Always replace
- 110 Nm (81 ft lb) + 1/4-turn (90°)

27 - Bolt M10 x 70

- Always replace
- 75 Nm (55 ft lb)

28 - Self-locking nut

- Always replace
- 100 Nm (74 ft lb)
- Replace only with exact same type of special nut

29 - Clamp

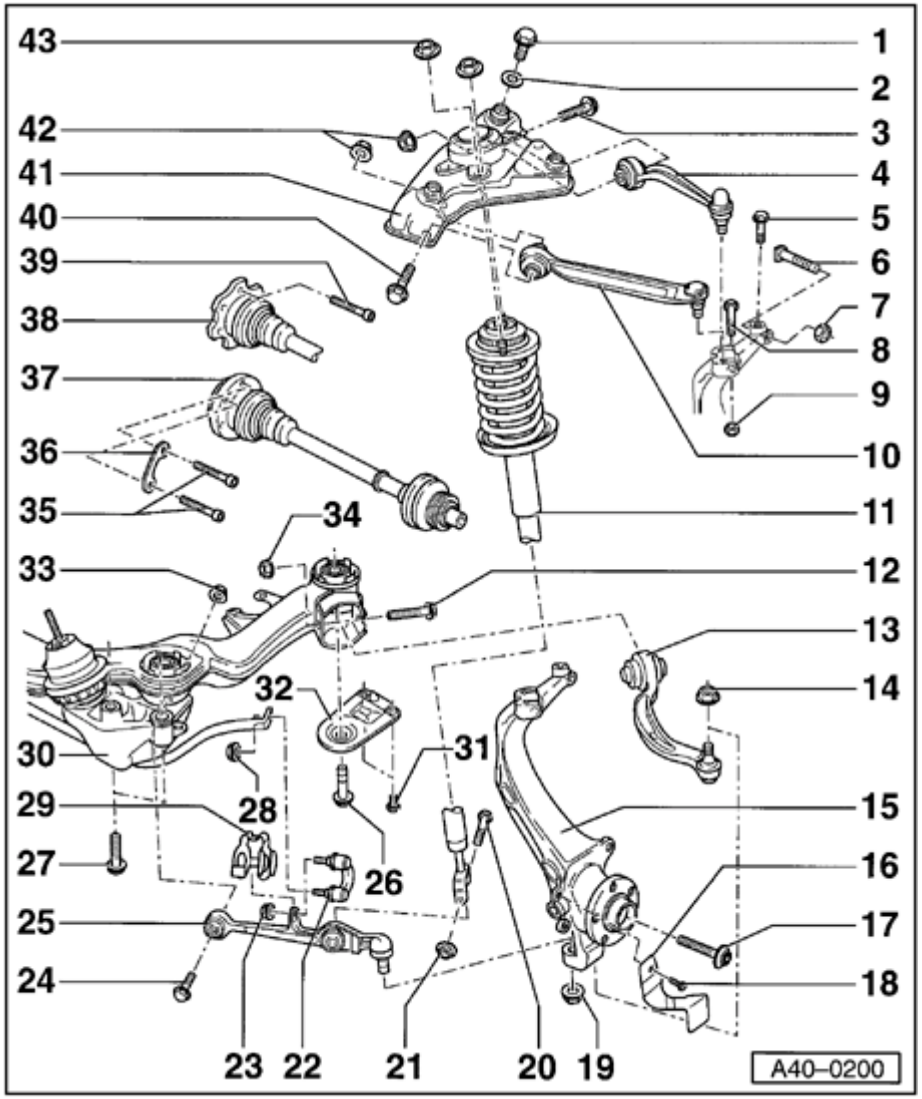
- Always replace
- Attached onto lower track control link - 25 -

30 - Subframe

- Removing and installing on vehicles with headlight range control ⇒ page 40-14
- Removing and installing ⇒ page 40-77
- Replacing bushing ⇒ page 40-86

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40-7



31 - Bolt M8 x 25

Note different tightening torques ⇒ Fig. 3 :

- 25 Nm (18 ft lb)
- 75 Nm (55 ft lb)

32 - Support for subframe

33 - Self-locking nut

- Always replace
- 80 Nm (59 ft lb) + 1/4-turn (90°)

34 - Self-locking nut

- Always replace
- 90 Nm (66 ft lb) + 1/4-turn (90°)

35 - Socket-head bolts

- M8 x 48: 40 Nm (30 ft lb)
- M10 x 48: 80 Nm (59 ft lb)

36 - Spacer plate

37 - Drive axle with Constant Velocity (CV) joint

- Removing and installing ⇒ page 40-17
- Servicing ⇒ page 40-20

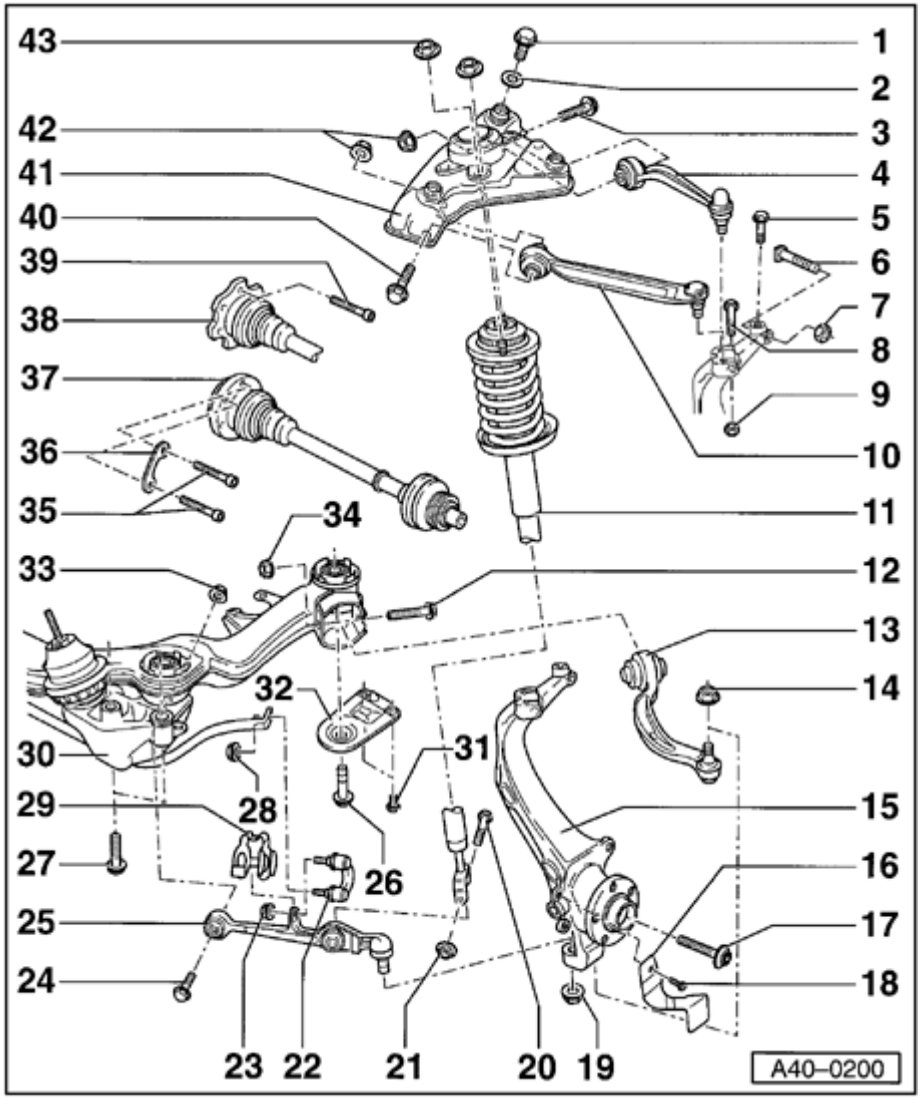
38 - Drive axle with triple-rotor joint

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♦ Servicing ⇒ page 40-29

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40-8



39 - 12-point socket-head bolt M10 x 20

- 80 Nm (59 ft lb)
- For vehicles with triple-rotor joint

40 - Bolt

- Always replace

Note different lengths:

- With steel mounting bracket: M10 x 60
- With aluminum mounting bracket: M10 x 62

41 - Mounting bracket

- Removing and installing ⇒ page 40-68
- Aluminum bracket m.y. 1998 ➢
- Note changes to wheel alignment ⇒ pages 44-15 and ⇒ Page 44-16
- Do not mix steel and aluminum brackets

42 - Self-locking nut

- Always replace
- 50 Nm (37 ft lb) + 1/4-turn (90°)

43 - Self-locking flanged nut

- Always replace
- 20 Nm (15 ft lb)

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As of chassis number 8DTA 321 912, stop plates were installed as end stops for vehicles with sport suspension.

Note:

Do not remove the stop plates.

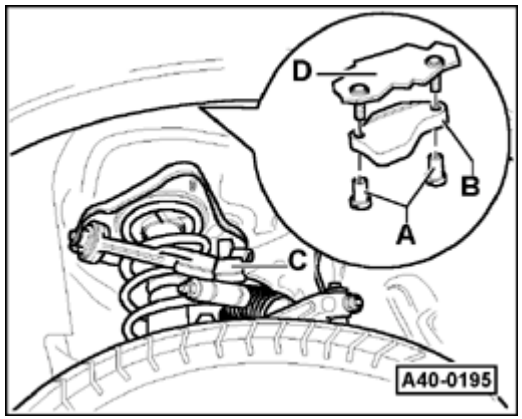


Fig. 1 Stop plates

A - Caps

B - Stop plate

C - Rear upper link

D - Bodywork

From m.y. 1997 ➢, buffer stops are installed at the rear upper links.

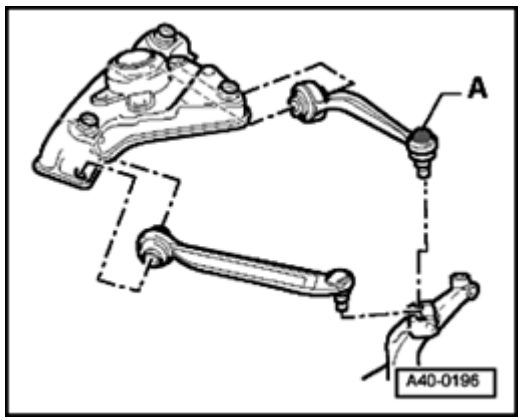


Fig. 2 Buffer stop

Rear upper link with buffer stop -A-

Note:

When replacing a rear upper link on a vehicle without a stop plate, always install the new version of the link.

CAUTION!

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- ***Upper links without buffer stops are installed on vehicles with stop plates.***
- ***Do not remove the stop plate.***

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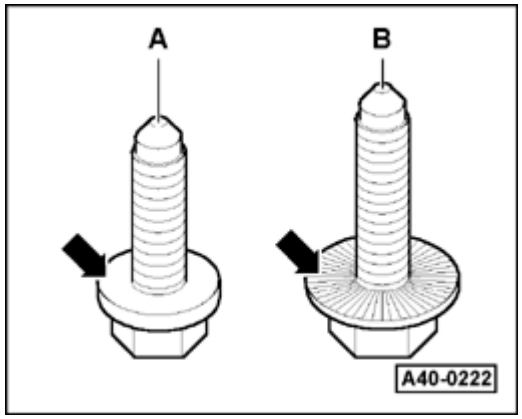


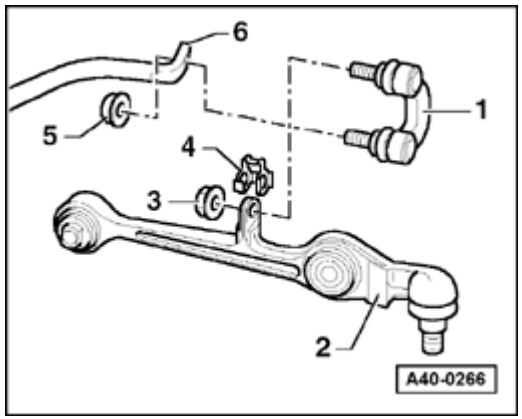
Fig. 3 Note different tightening torques

Only ribbed bolts are installed from m.y. 1998 ➢; this bolt can also be installed on older models.

- Bolt -A- not ribbed (arrow) tightening torque: 25 Nm (18 ft lb)
- Bolt -B- ribbed (arrow) tightening torque: 75 Nm (55 ft lb)

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Running change from connecting link with ball joint to connecting link with rubber bushing (m.y. 1999 ➢)



➢ Connecting link with ball joint

1 - Connecting link with ball joint

2 - Lower track control link

3 - Self-locking hex nut

40 Nm (30 ft lb) + 90°

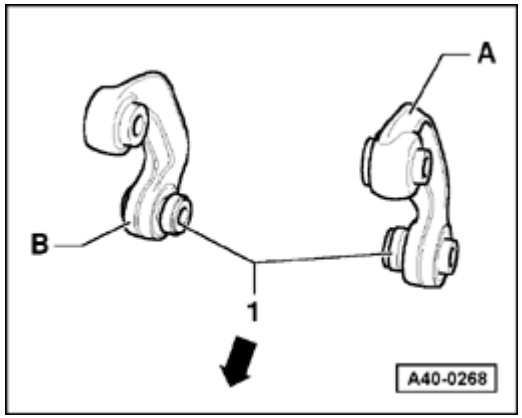
4 - Clip

5 - Self-locking nut

100 Nm (74 ft lb)

6 - Stabilzer bar

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Connecting link with rubber bushing

Connecting link -A- for left side of vehicle.

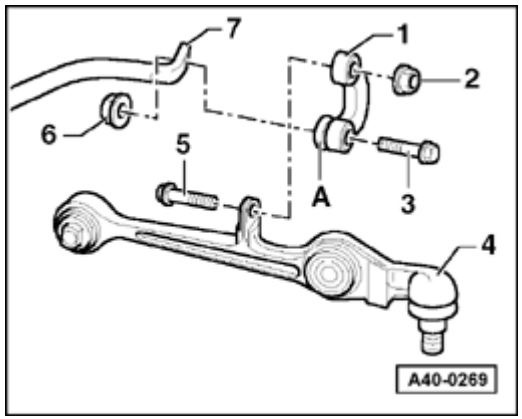
- Arrow on connecting link points in direction of travel

Permanently installed spacer -1- at connecting link must be installed at stabilizer bar.

Connecting link -B- for right side of vehicle.

- Arrow on connecting link points in direction of travel
- Arrow points in direction of travel

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Bonded rubber bushings can only be turned a limited amount. Therefore only tighten bolted connections at the suspension links when the vehicle is standing on the ground.

1 - Connecting link with rubber bushing

2 - Self-locking hex nut

40 Nm + 90°

3 - Hex bolt

4 - Lower track control link

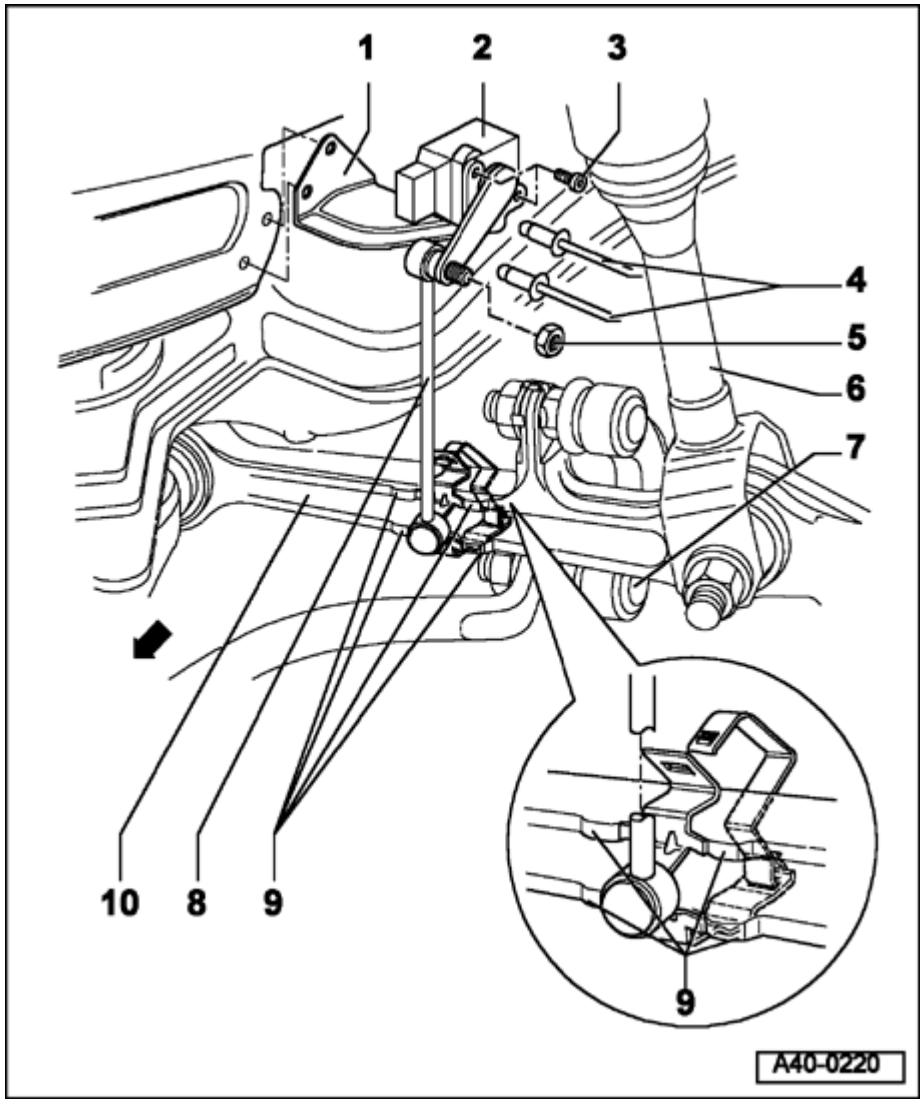
5 - Hex bolt

6 - Self-locking hex nut

40 Nm (30 ft lb) + 90°

7 - Stabilizer bar

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Headlight range adjuster, removing and installing

Through m.y. 1998 on vehicles with xenon headlights, a headlight range adjuster may be installed in the left headlight.

Arrow points in direction of travel.

1 - Mounting plate

2 - Level sensor

3 - Bolts

- 4 Nm +1/-0 Nm (35 in. lb +9/-0 in. lb)

4 - Pop rivets (2x steel)

- 4.8 mm diameter

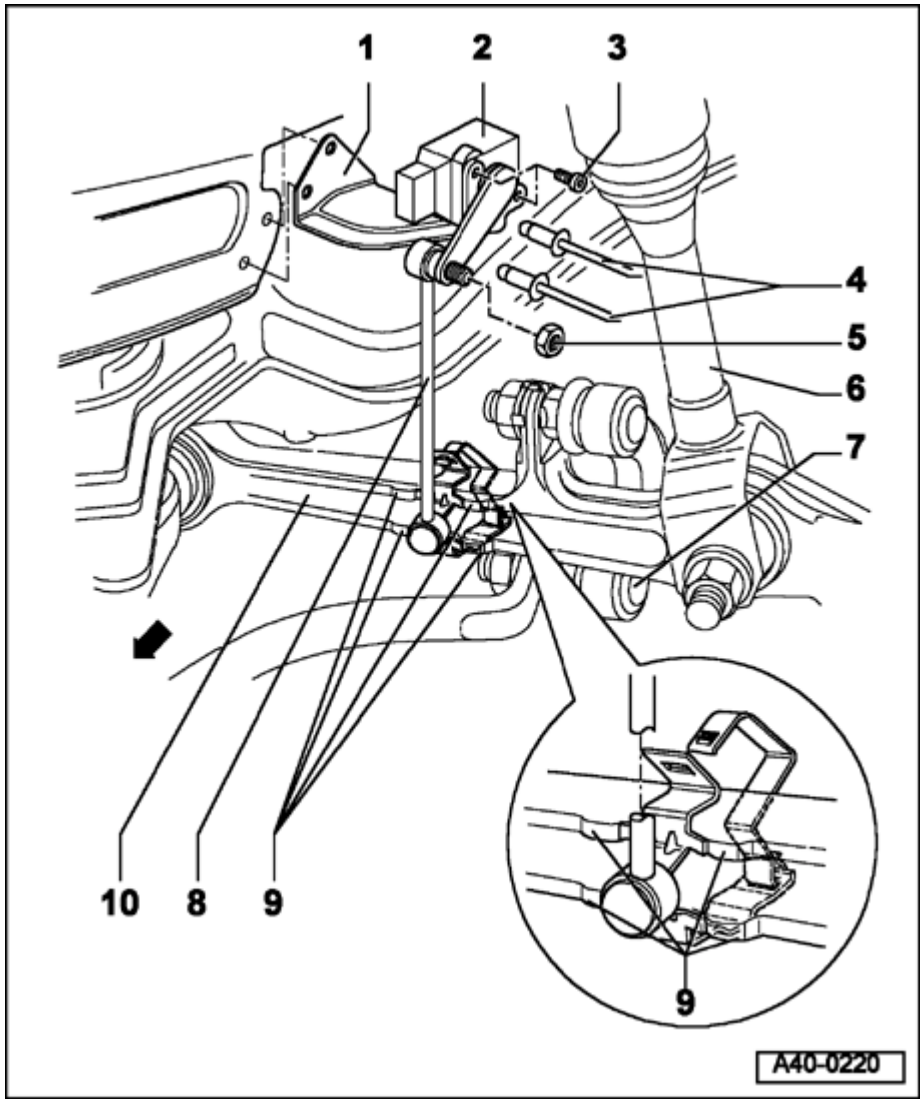
5 - Nut

- 3 Nm +1/-0 Nm (27 in. lb +9/-0 in. lb)
- ⇒ Note, page 40-16

6 - Shock absorber

7 - Connecting link

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8 - Rod for headlight range adjuster

9 - Protrusions

- Position clamp between two protrusions

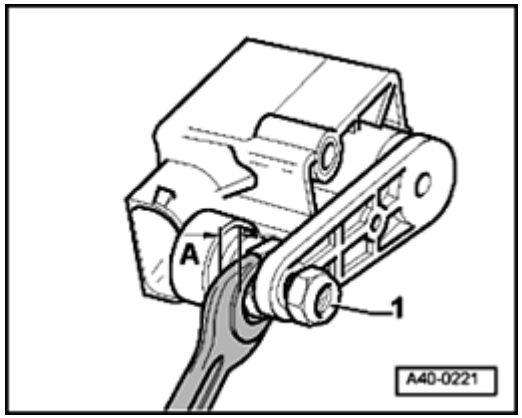
10 - Lower track control link

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When removing and installing the lower track control link, the clamp must be removed

Note:

Attach the rod for headlight range adjuster to the level sensor, using a 10 mm open end wrench no thicker than dimension -A- to prevent damaging the seal.



- Dimension -A-: 4 mm (0.157 in.)
- Nut -1- tightening torque: 3 Nm +1/-0 Nm (27 in. lb +9/-0 in. lb)

- Using pliers, secure rod for headlight range adjuster to lower track control link between two protrusions

When installing the headlight range adjuster, make sure that the arm for the level sensor and the rod for the headlight range adjuster are correctly aligned to each other.

Notes:

- *Rod for headlight range adjuster must be vertical.*
- *Level sensor arm must point downward and forward.*

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Front drive axles, removing and installing

WARNING!

- ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

Removing

- Remove wheel trim.

  On light-alloy wheels use puller in vehicle tool kit to remove trim cap

- Remove collar bolt for drive axle.

WARNING!

The vehicle must be standing on its wheels

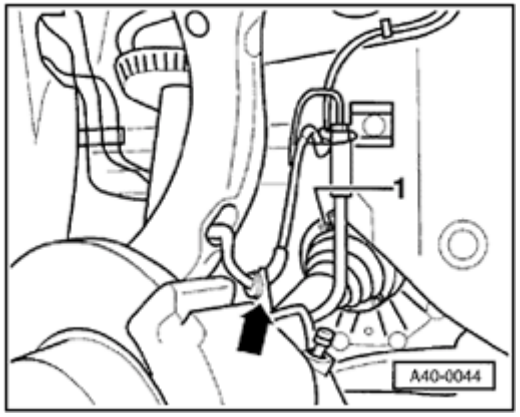
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when loosening or tightening the collar bolt for the drive axle (item - 17 -, page ⇒ Page 40-4). Otherwise the risk of an accident exists.

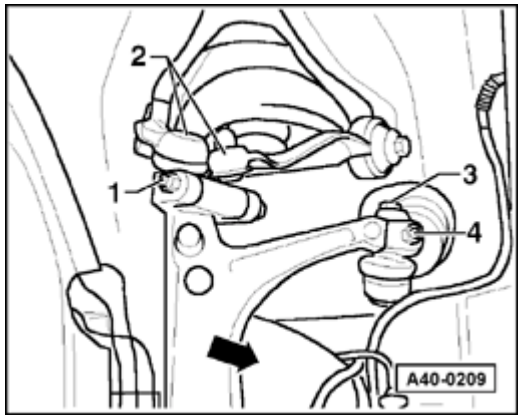
- Remove wheel.

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40-18



- Remove socket-head bolts -1- and disconnect drive axle from drive flange on transmission.
- Remove ABS wheel speed sensor wiring from retainer on brake caliper (arrow).
- Pull ABS wheel speed sensor out from wheel bearing housing slightly.



- Remove nut -1-, remove bolt and disconnect both links -2- upward.

CAUTION!

- ***Do not use a chisel (or similar) to widen the slots in the wheel bearing housing.***
- ***Do not loosen bolts -3- and -4-. Otherwise, the wheel alignment must be checked.***

- Swing wheel bearing housing aside in direction of arrow.
- Remove drive axle.

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Installing

- Install drive axle into wheel bearing housing and bolt it to drive flange on transmission.

- Install both upper links and tighten nut to 40 Nm (30 ft lb).

  When tightening, press upper links downward as far as possible

- Fully tighten bolts connecting drive axle to drive flange on transmission.

  - M8 bolts: 40 Nm (30 ft lb)

  - M10 bolts: 80 Nm (59 ft lb)

- Push ABS wheel speed sensor into wheel bearing housing up to stop and insert sensor wiring into retainer on brake caliper.

- Install wheel.

- Install and tighten new bolt for drive axle.

  - M14 bolt: 115 Nm (85 ft lb) + 1/2-turn (180

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(180 °)

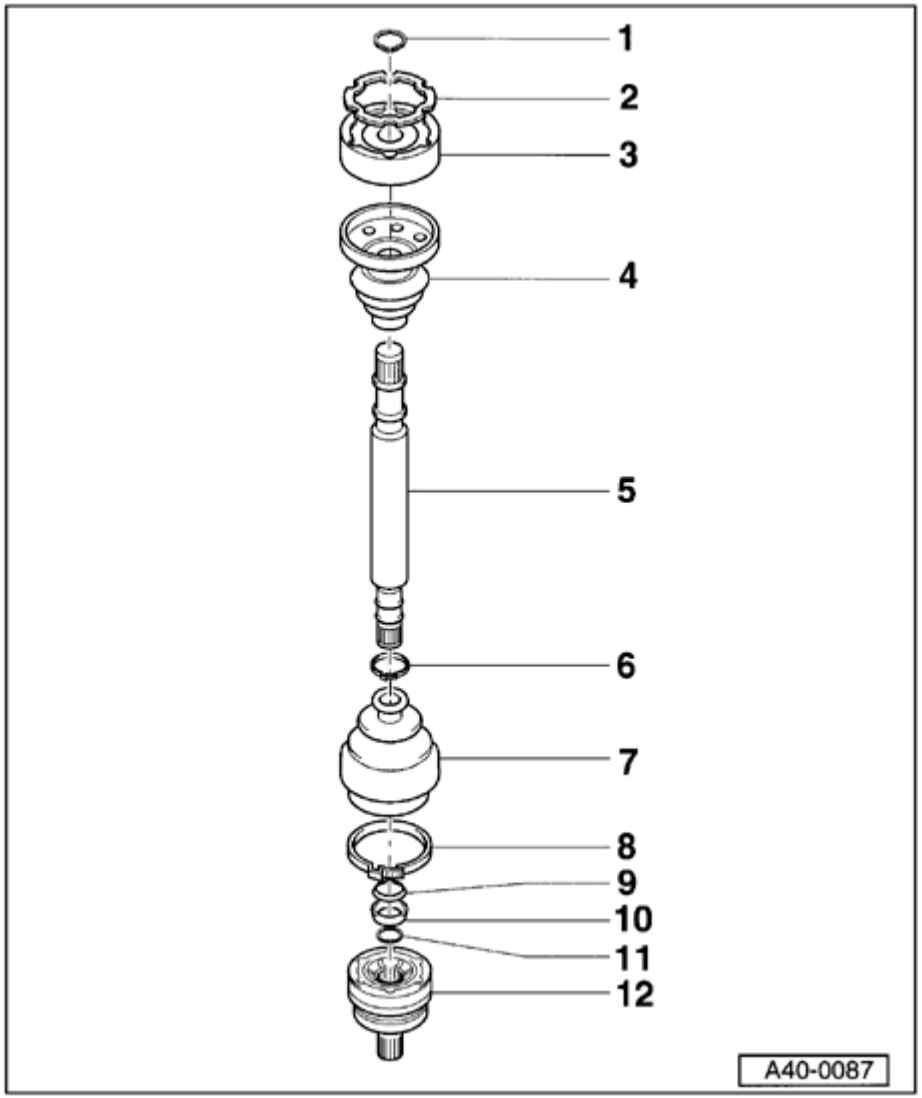
- M16 bolt: 190 Nm (140 ft lb) + 1/2-turn (180 °)

WARNING!

The vehicle must be standing on its wheels when loosening or tightening the collar bolt for the drive axle (item - 17 -, page ⇒ Page 40-4). Otherwise the risk of an accident exists.

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40-20



Drive axle with inner Constant Velocity (CV) joint, servicing

Constant velocity (CV) joints are packed with grease G 000 603.

Outer CV joints

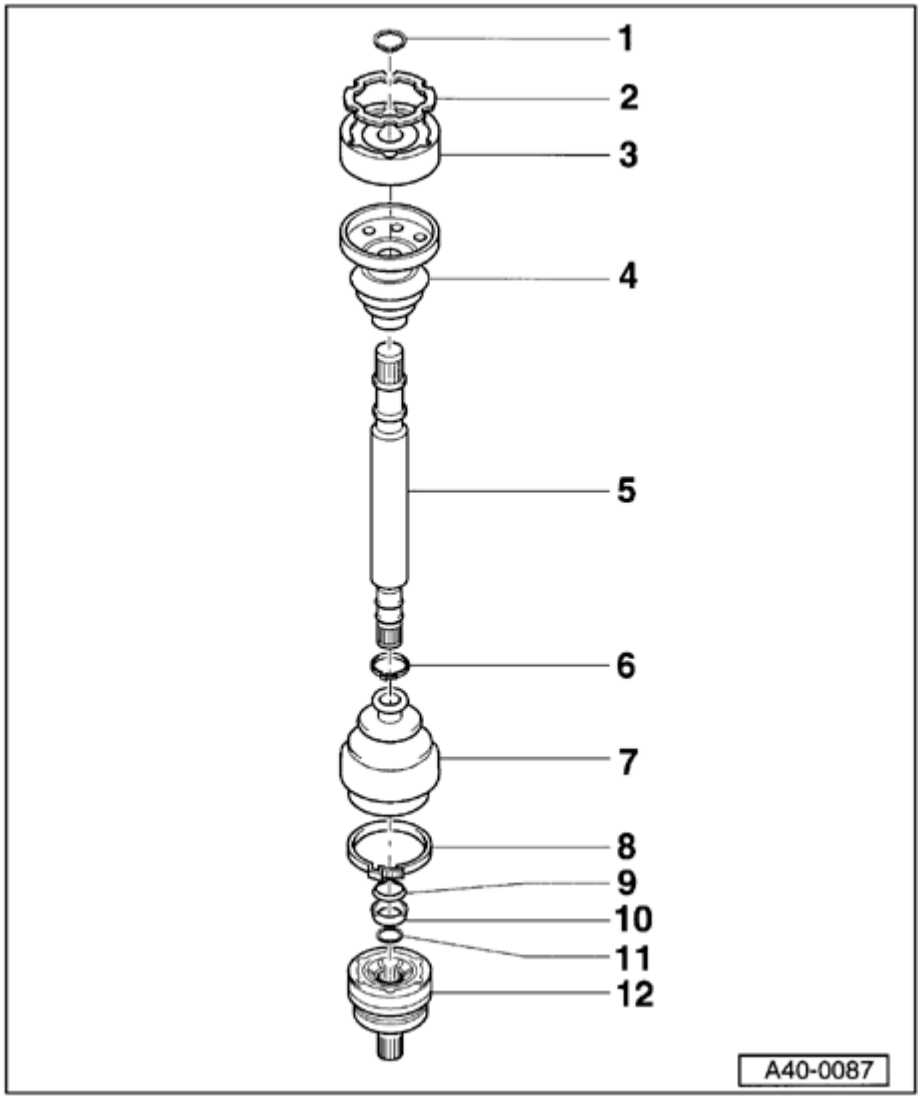
Outer joint dia.	Total grease required	Proportions:	
		Joint	Boot
88 mm (3.5 in.)	100 g (3.5 oz.)	50 g (1.8 oz)	50 g (1.8 oz)
98 mm (3.9 in.)	120 g (4.2 oz.)	80 g (2.8 oz.)	40 g (1.4 oz.)

Inner CV joints

Inner joint dia.	Total grease required	Proportions:	
		Joint	Boot
100 mm (3.9 in.)	110 g (3.8 oz.)	55 g (1.9 oz)	55 g (1.9 oz)
108 mm (4.3 in.)	120 g (4.2 oz.)	35 g (1.2 oz.)	85 g (3.0 oz.)
Re-grease the joint, if necessary, when replacing the CV joint boot.			

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40-21



1 - Circlip

- Always replace
- Use VW161a circlip pliers for removing and installing

2 - Gasket

- To replace, remove protective backing and stick onto joint

3 - Inner CV joint

- Outer diameter 100 or 108 mm (3.9 or 4.3 in.), depending on engine/transmission application
- Replace only complete joint
- Pressing off ⇒ page 40-26
- Pressing on ⇒ page 40-27
- Greasing ⇒ page 40-20

4 - CV joint boot with cap

- With vent hole
- Check for splits and abrasions
- Use arbor to drive off
- Seal cap end with D-3 before attaching to CV joint

5 - Axle shaft (tubular shaft)

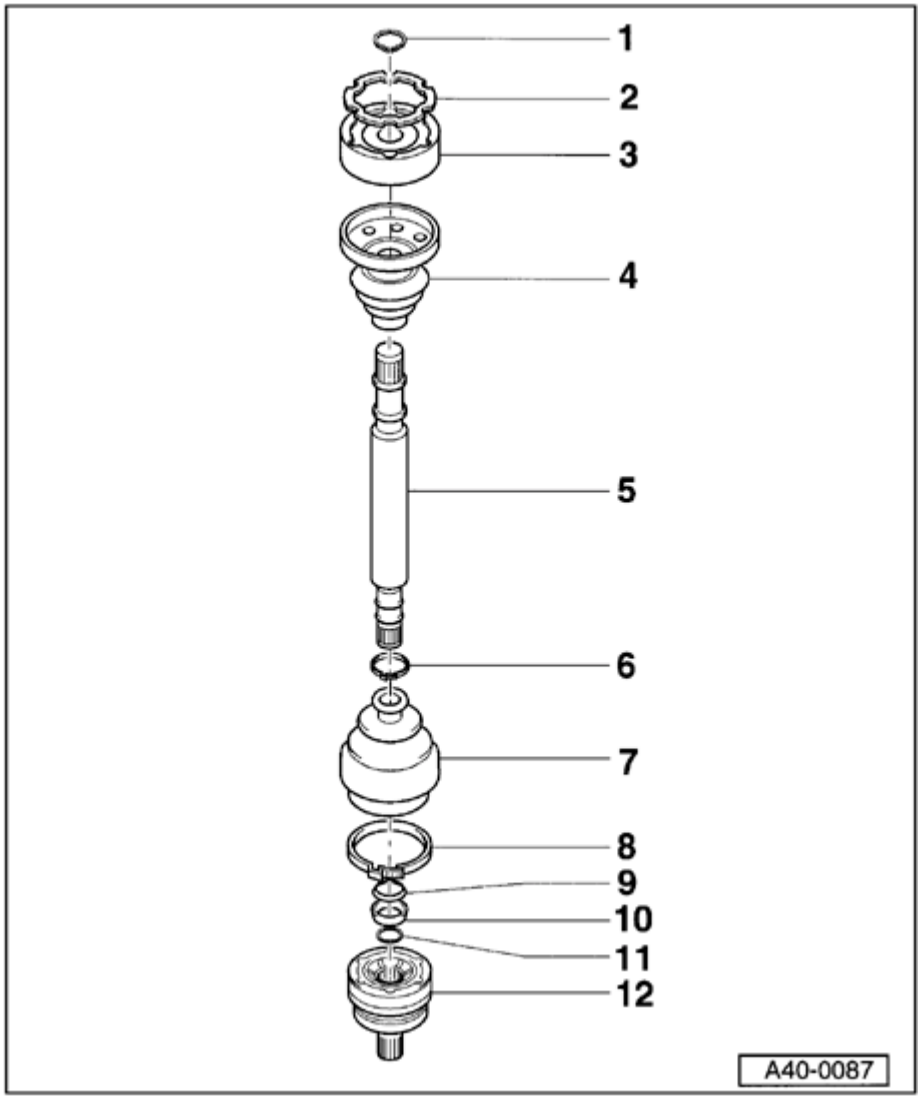
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6 - Clamp

- Always replace

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40-22



7 - CV joint boot

- Check for splits and abrasions
- Ventilate joint boot before tightening small clamp ⇒ page 40-28
- As of chassis no. 8DTA 279 794 revised boots are installed on 88 mm outer joint ⇒ page 40-25

8 - Clamp

- Always replace
- Tightening ⇒ pages 40-25 and ⇒ Page 40-28

9 - Spring washer

- Larger dia. (concave side) contacts spacer washer
- Installation position ⇒ page 40-27

10 - Spacer washer

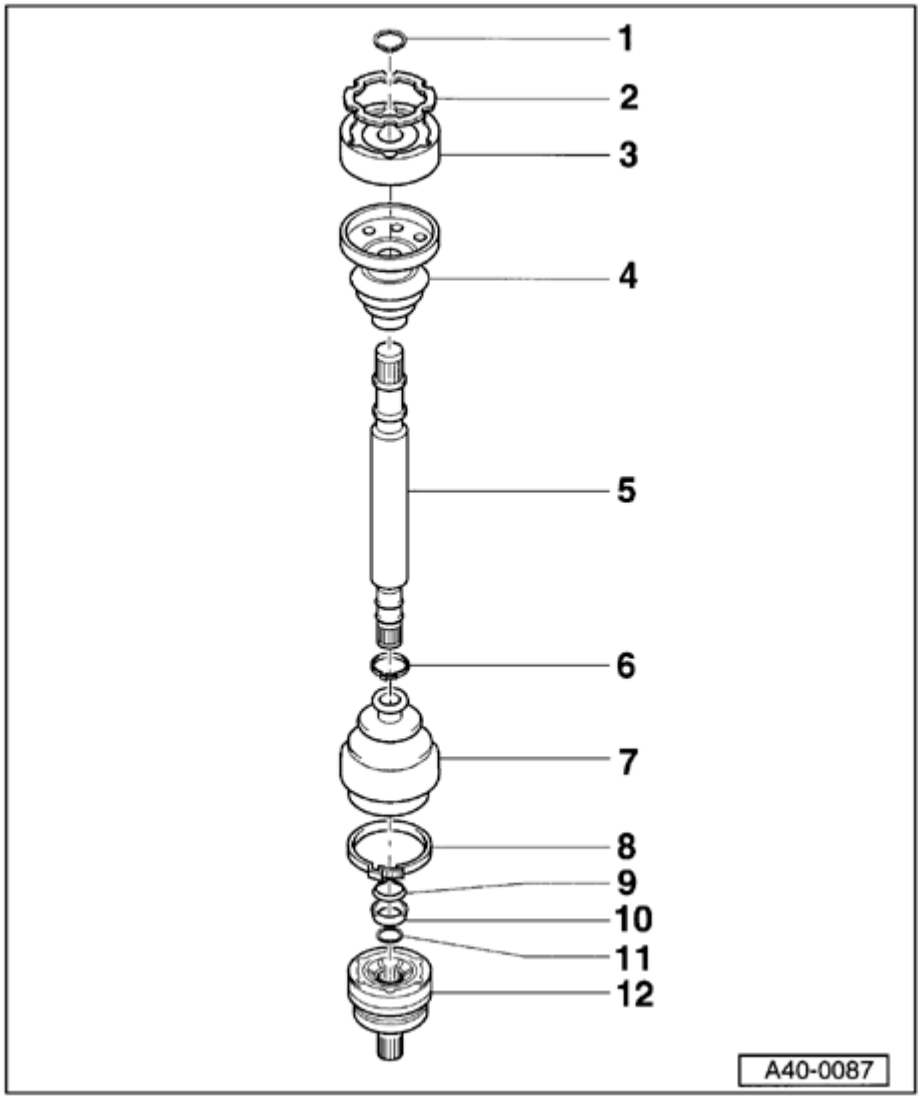
- Installation position ⇒ page 40-27

11 - Circlip

- Always replace
- Insert into groove in shaft

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40-23



12 - Outer CV joint

- Outer diameter 88 or 98 mm (3.5 or 3.9 in.), depending on engine/transmission application
- Replace only complete joint
- Pressing off ⇒ page 40-26
- Installing: Using plastic hammer, drive joint onto shaft until circlip locks in place in annular groove of CV joint
- Greasing ⇒ page 40-20

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Plastic CV joint boots

Special tools, test equipment and auxiliary items

VAG1275	3207	VW411
VW401/402	VW412	VW522
40-204 A	VAG1682	3340

On the Audi A4, new plastic CV joint boots are installed on the 88 mm outer joint (wheel end) of the front axle.

The plastic boots can be identified because they are made out of a harder material than the rubber boots.

The harder plastic boots necessitates the use of stainless steel clamps for attaching the boots.

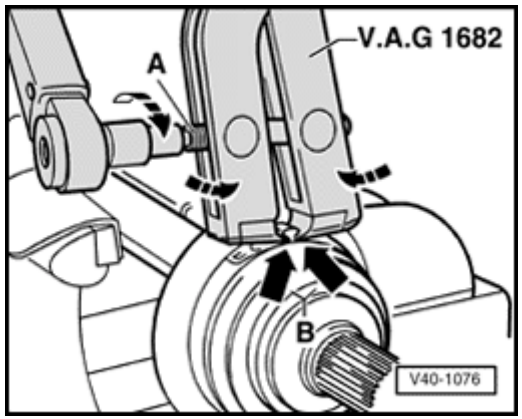
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40-25

Clamps used on rubber joint boots are tightened using VAG1275 pliers.

The following instructions are only for stainless steel clamps

Tightening clamp on outer CV joint

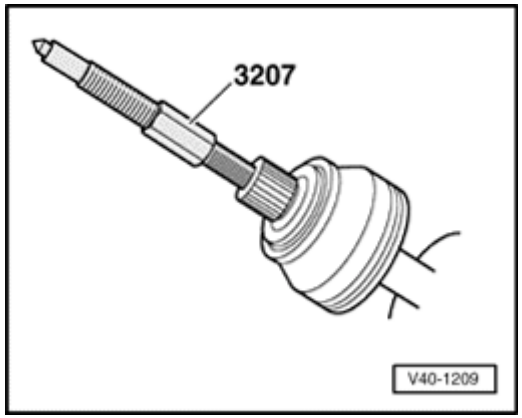


- Position VAG1682 pliers as shown in illustration. Make sure jaws of pliers seat in grooves of clamp (arrows -B-).
- Using torque wrench, turn spindle -A- and tighten clamp.
  - Do not cant pliers
  - Tightening torque: 20 Nm (15 ft lb)

Notes:

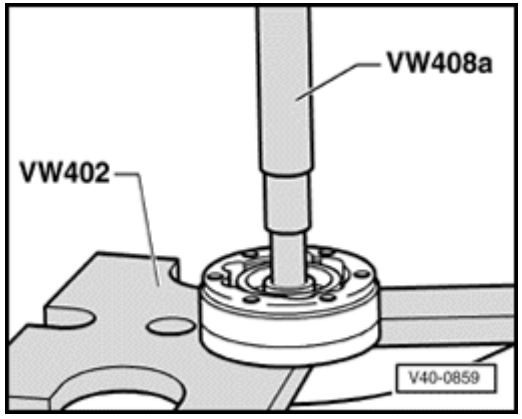
- *Use a torque wrench with a range of 5-50 Nm (approx. 4-40 ft lb) (e.g. VAG1331).*
- *Make sure spindle -A- turns freely. If necessary lubricate the spindle threads with MOS2 grease.*
- *If the spindle does not turn freely (e.g. spindle is dirty), the clamping force required on the clamp will not be achieved even though the correct tightening torque is indicated.*

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Pressing off outer constant velocity joint

- Clamp drive axle in vise using protective jaw covers.
- Remove clamp and slide back boot.
- Thread 3207 pressure spindle (with M16 and M14 threaded sections) into end of constant velocity joint until joint is pressed off of axle shaft.



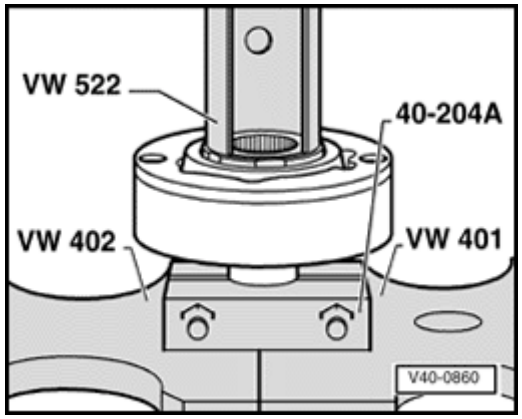
Pressing off inner constant velocity joint

Notes:

- *First use a drift to drive off the boot.*
- *Support the ball hub.*

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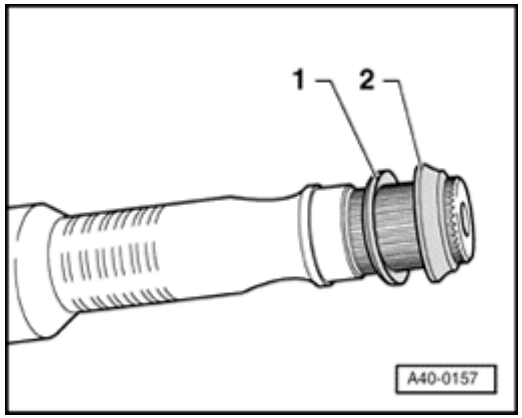


Pressing on inner constant velocity joint

- Press joint on up to stop.
- Install circlip.

Note:

The chamfer on the inner diameter of the ball hub (splines) must face the contact shoulder on the drive axle.

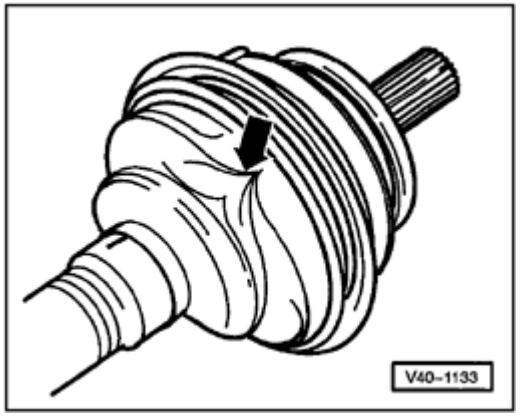


Installation positions of spacer washer and spring washer (outer CV joint end)

1 - Spring washer

2 - Spacer washer (plastic)

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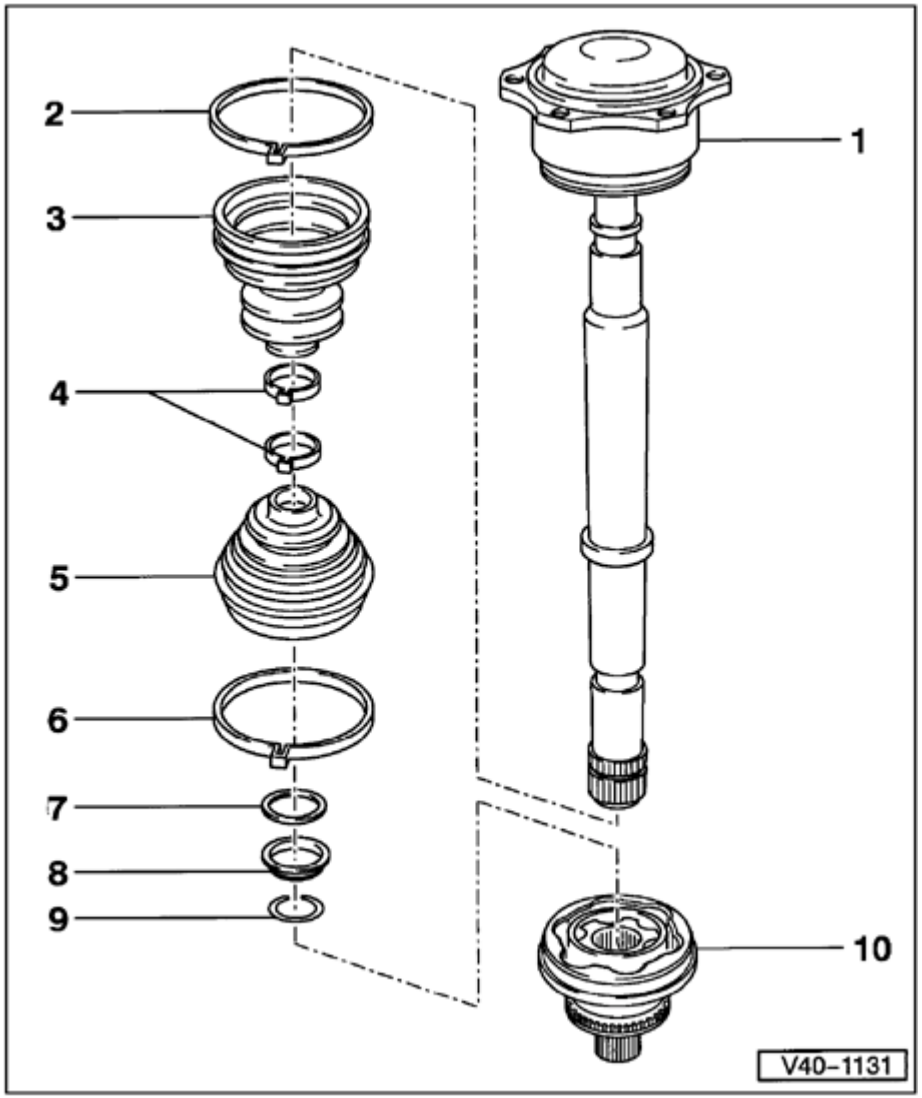
Ventilating joint boot

Only for rubber joint boot.

The joint boot is often pressed in while being installed on the body of the joint. This creates a vacuum inside the boot which draws it inward with a fold (arrow) while driving. Therefore after installing, lift the boot at the small diameter end to equalize pressure.

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Drive axle with triple-rotor joint, servicing

Grease quantity and type

Note:

Pack the outer constant velocity joints with the following greases:

- *88 mm joint diameter: G 000 603*
- *98 mm joint diameter: G 000 633*

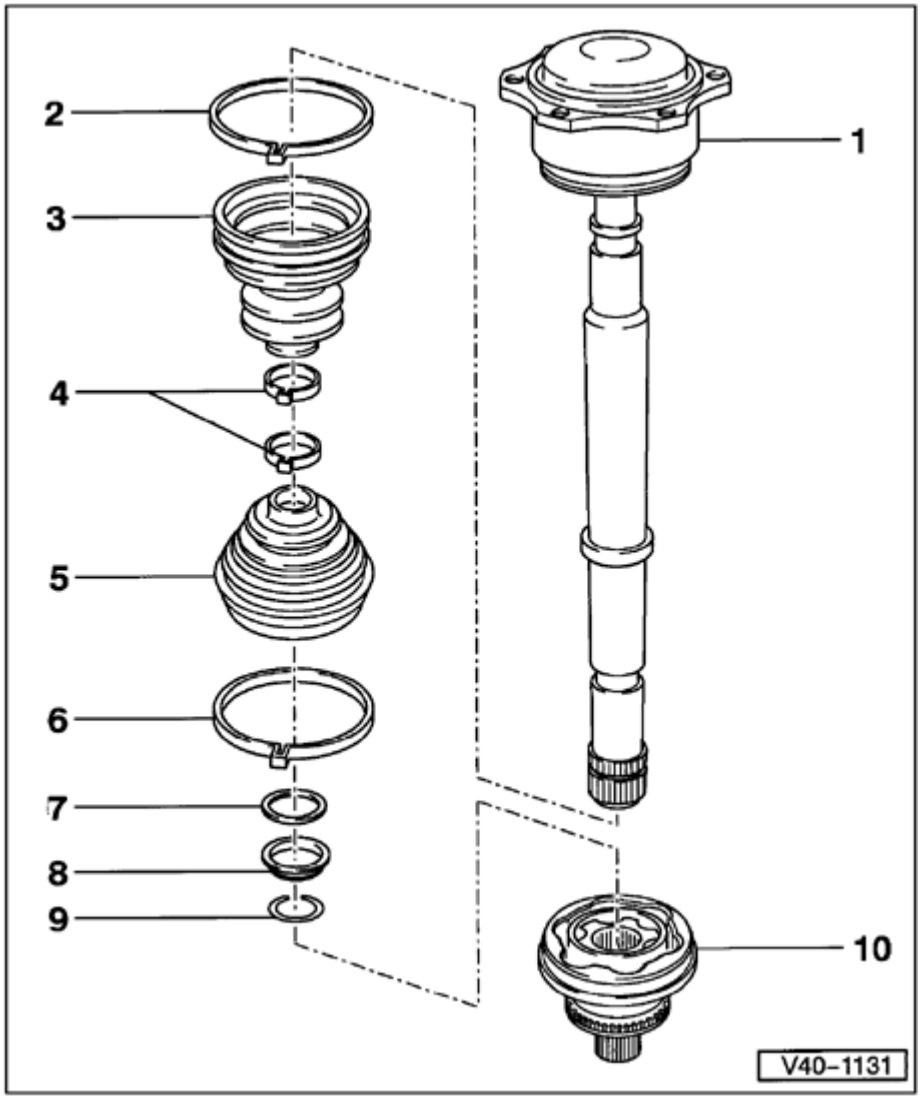
CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

Outer joint dia.	Total amt. of grease	Proportions	
		Joint	Boot
88 mm (3.5 in.)	100 g (3.5 oz.)	50 g (1.8 oz.)	50 g (1.8 oz.)
98 mm (3.9 in.)	120 g (4.2 oz.)	80 g (2.8 oz.)	40 g (1.4 oz.)

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1 - Drive axle with triple-rotor joint

- Replacement part supplied with boot and filled with grease

2 - Clamp

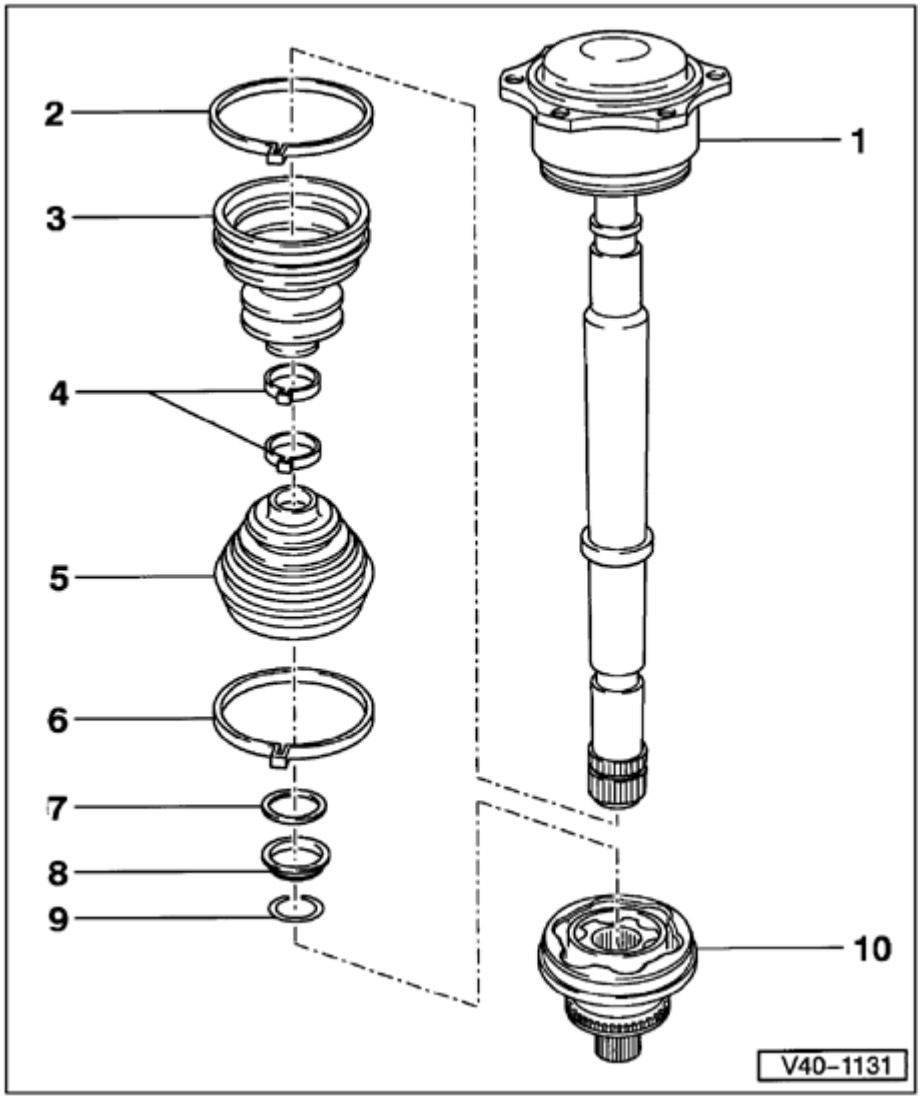
- Always replace
- Tightening ⇒ Fig.1

3 - Boot for inner triple-rotor joint

- Check for splits and abrasions
- Only 32 mm diameter shafts have replaceable inner boots
- To replace, drive off outer constant velocity joint
- When slipping onto profiled shaft, apply small quantity of grease to bead on profiled shaft and use VAG1474/5 wedge (part of VAG1474) to carefully position boot ⇒ Fig. 4

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4 - Clamps

- Always replace
- Tightening ⇒ Fig.1

5 - Boot for outer constant velocity joint

- Check for splits and abrasions
- Before tightening clamp, briefly lift end of boot to equalize pressure (ventilate) ⇒ Fig. 3
- As of chassis no. 8DTA 279 794, new boots were introduced for 88 mm outer joint (wheel end) ⇒ Fig. 1

6 - Clamp

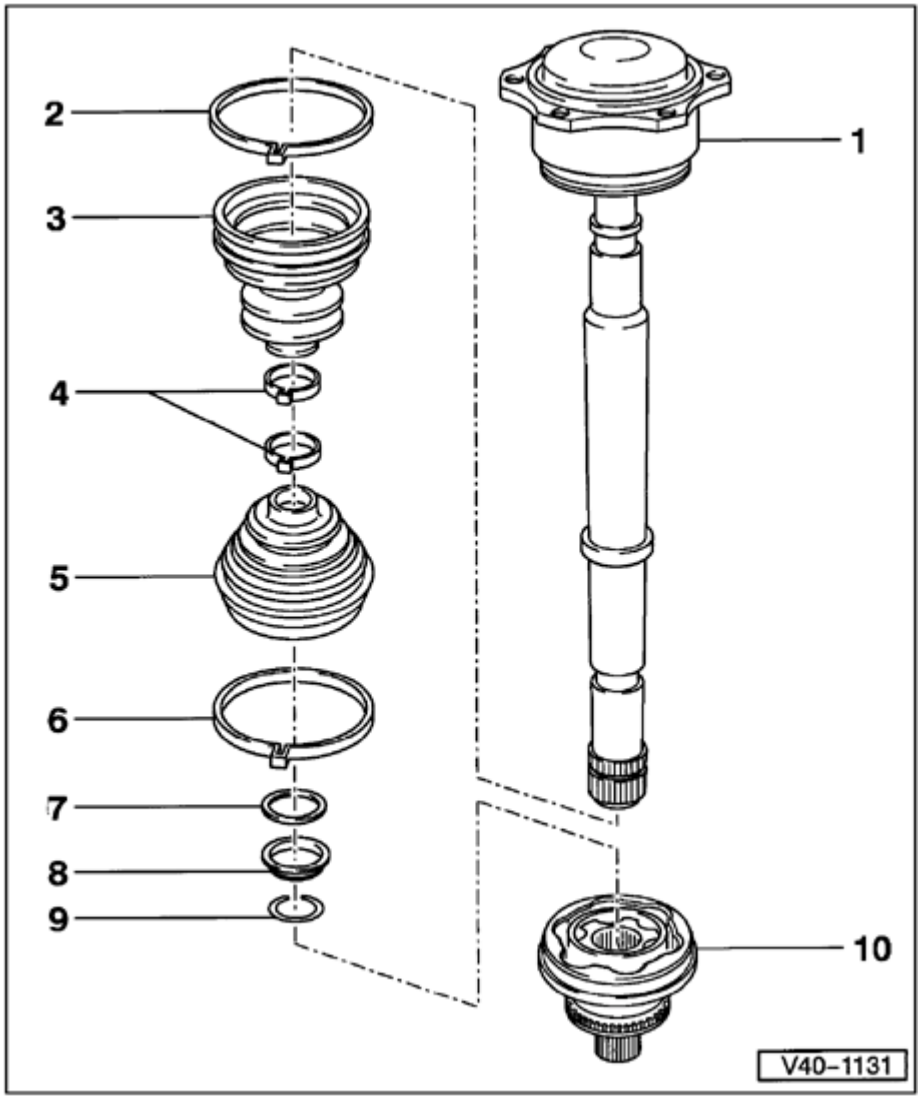
- Always replace
- Tightening ⇒ Fig. 1

7 - Spring washer

- Installation position ⇒ Fig. 5

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8 - Spacer washer (plastic)

- Installation position ⇒ Fig. 5

9 - Circlip

- Always replace
- Install into circular groove on axle shaft before installing joint
- Not visible with joint installed

10 - Outer constant velocity joint

- Outer diameter 88 or 98 mm, depending on engine/transmission combination
- Replace as complete part only
- Pressing off ⇒ Fig. 2 (with hollow shaft ⇒ page 40-36)
- Installing: use plastic hammer to drive onto axle shaft until circlip engages
- Greasing ⇒ page 40-29

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Clamps used on rubber joint boots are tightened using VAG1275 pliers

Instructions in Fig. ⇒ 1 are only for stainless steel clamps

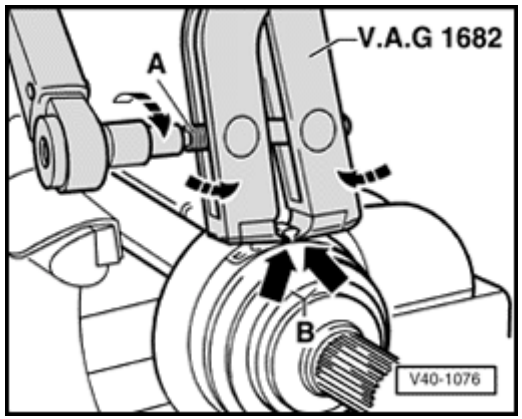


Fig. 1 Tightening clamp on outer CV joint

- Position VAG1682 pliers as shown in illustration. Make sure jaws of pliers seat in grooves of clamp (arrows -B-).
- Using torque wrench, turn spindle -A- and tighten clamp.
  - Do not cant pliers
  - Tightening torque: 20 Nm (15 ft lb)

Notes:

- *Use a torque wrench with a range of 5-50 Nm (approx. 4-40 ft lb) (e.g. VAG1331).*
- *Make sure spindle -A- turns freely. If necessary lubricate the spindle threads with MOS2 grease.*
- *If the spindle does not turn freely (e.g. spindle is dirty), the clamping force required on the clamp will not be achieved even though the correct tightening torque is indicated.*

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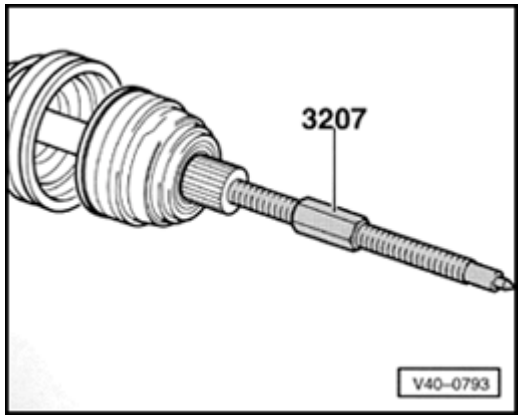


Fig. 2 Pressing off outer constant velocity joint

- Clamp drive axle in vise using protective jaw covers.
- Remove large clamp and slide back boot.
- Thread special tool into end of constant velocity joint until joint is pressed off of axle shaft.

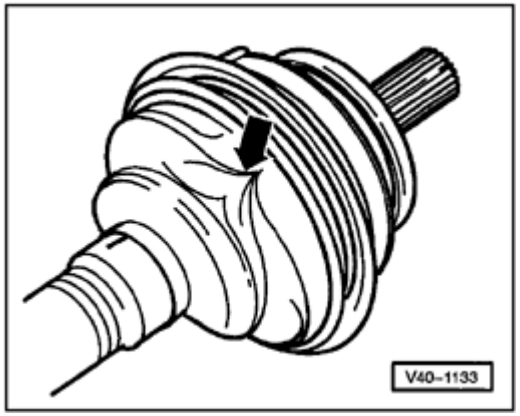


Fig. 3 Ventilating joint boot

Only for rubber joint boot

The joint boot is often pressed in while being installed on the body of the joint. This creates a vacuum inside the boot which draws it inward with a fold (arrow) while driving. Therefore after installing, lift the boot at the small diameter end to equalize pressure.

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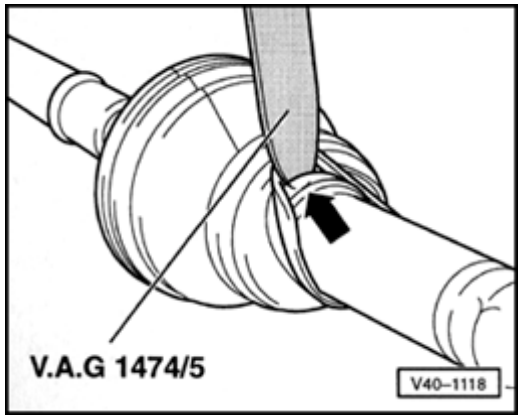


Fig. 4 Positioning boot over bead of profiled shaft

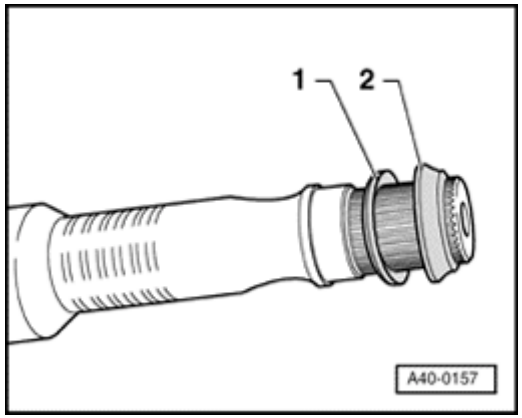


Fig. 5 Installation positions of spacer washer and spring washer (outer CV joint end)

1 - Spring washer

2 - Spacer washer (plastic)

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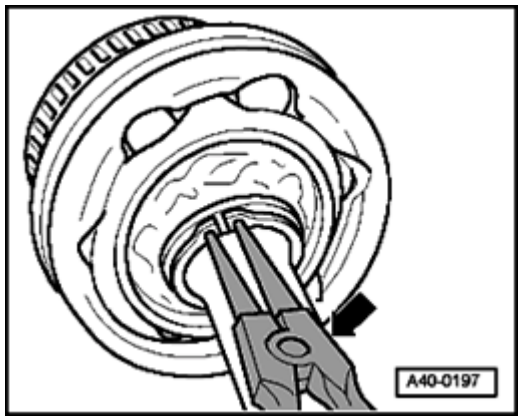
Axle shaft (hollow shaft), servicing

The axle shaft can be identified by a circlip on the axle shaft at the outer joint

Removing outer joint

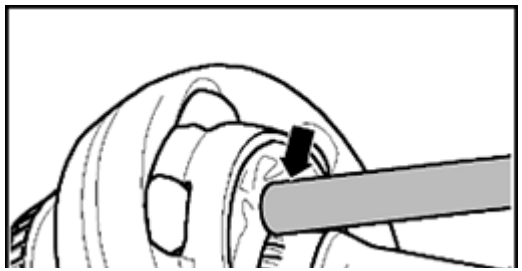
- Clamp drive axle in vise using protective jaw covers.

- Remove clamps (large and small) and slide back boot.



- Remove circlip using pointed pliers (arrow) and push back spring washer and spacer washer.

Driving off outer joint



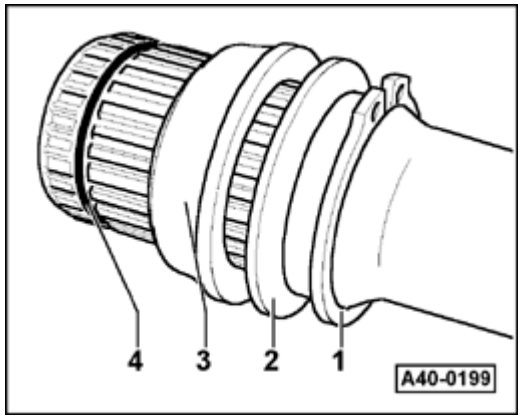
- Only drive off using drift (brass or copper) at ball hub (arrow).

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Assembly

- When slipping boot onto profiled shaft, apply small quantity of grease to bead on profiled shaft and carefully position boot.



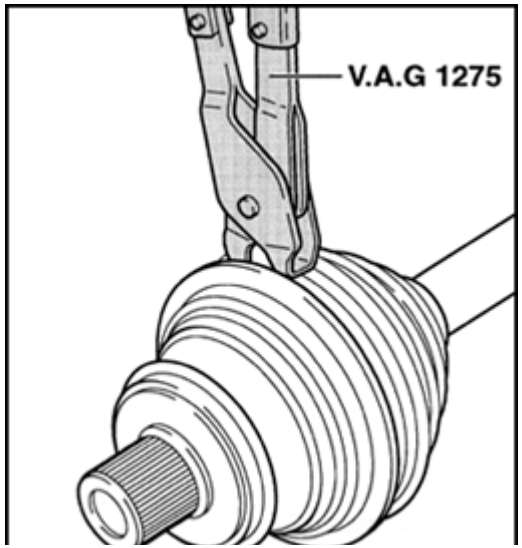
1 - Circlip

2 - Dished washer

3 - Spacer washer (plastic)

4 - Circlip (snap ring)

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



Tightening clamp

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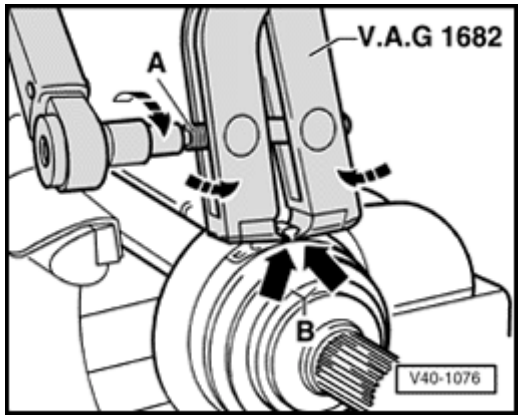
Plastic CV joint boots

On the Audi A4, new plastic CV joint boots are installed on the 88 mm outer joint (wheel end) of the front axle.

The plastic boots can be identified because they are made out of a harder material than the rubber boots.

The harder plastic boots necessitates the use of stainless steel clamps for attaching the boots.

Instructions for stainless steel clamps only



Tightening clamp on outer CV joint

- Position VAG1682 pliers as shown in illustration. Make sure jaws of pliers seat in grooves of clamp (arrows -B-).
- Using torque wrench, turn spindle -A- and tighten clamp.
  - Do not cant pliers
  - Tightening torque: 20 Nm (15 ft lb)

Notes:

- *Use a torque wrench with a range of 5-50 Nm (approx. 4-40 ft lb) (e.g. VAG1331).*
- *Make sure spindle -A- turns freely. If necessary lubricate the spindle threads with MOS2 grease.*
- *If the spindle does not turn freely (e.g. spindle is dirty), the clamping*

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force required on the clamp will not be achieved even though the correct tightening torque is indicated.

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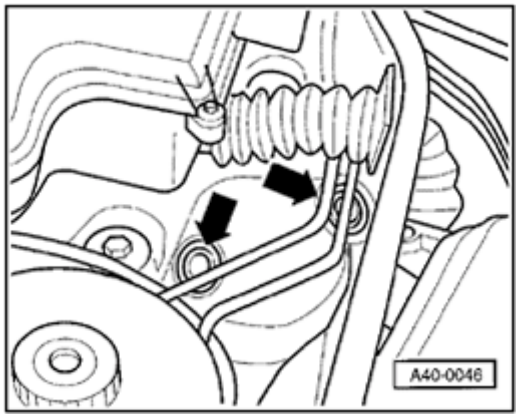
Suspension strut, removing and installing

Removing

- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap.

- Remove wheels.



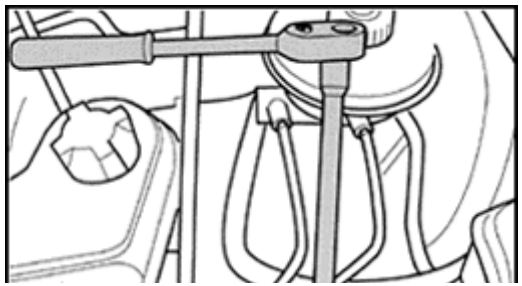
- Remove rubber grommets in plenum chamber (arrows).

Note:

For vehicles with headlight range control ⇒ page 40-14 .

CAUTION!

To prevent damage to the joint of the lower links from excessive rebound, support using VAG1383-A (engine and transmission lifter).



- Remove suspension strut nuts -1- from body.
- Detach ABS wheel speed sensor wire from bracket at brake caliper.

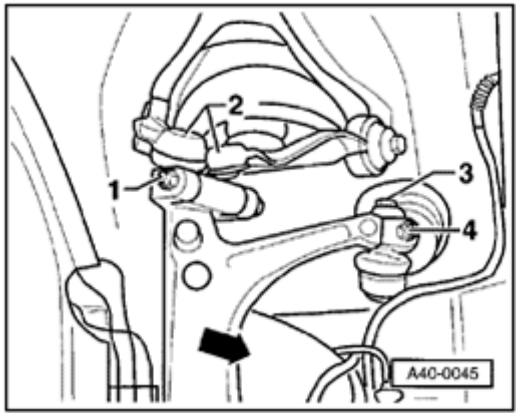
CAUTION!

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Be careful not to damage the surface of the brake lines.

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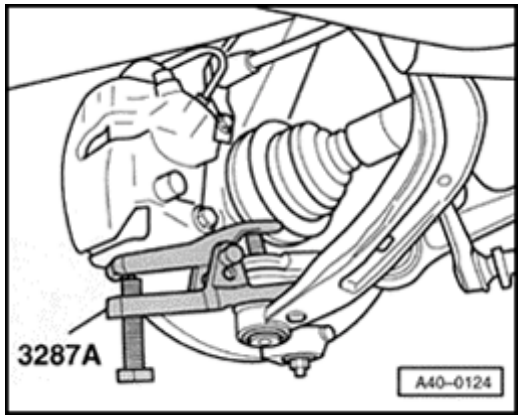
- Remove nut -1- and bolt, then pull both links -2- upward and out.
- Swivel wheel bearing housing aside in direction of arrow.

CAUTION!

- ***Do not use a chisel (or similar) to widen the slots in the wheel bearing housing.***
- ***Do not loosen bolts -3- and -4-. Otherwise, the wheel alignment must be checked.***

The guide link must be removed from the wheel bearing housing in order to be able to remove the bolt mounting the suspension strut to the track control link.

- If necessary, counterhold ball joint using 4 mm hex wrench.



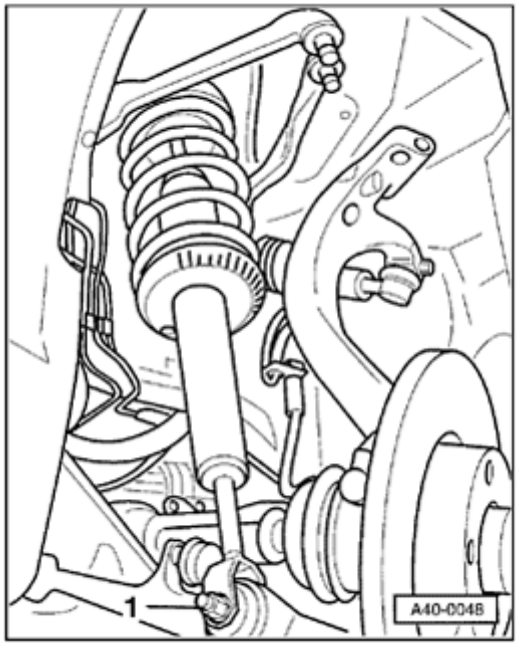
- Unscrew nut for guide link ball joint and press out ball joint.

Note:

Be careful not to damage the boot.

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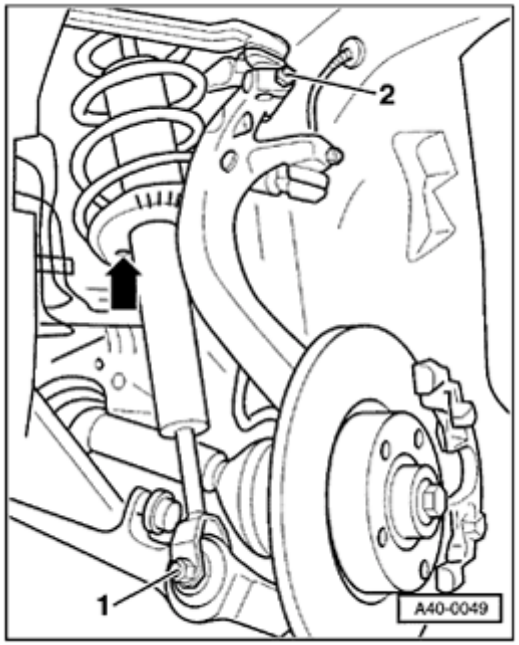
- Remove bolt -1- mounting suspension strut to lower track control link.
- Remove suspension strut downward.

Notes:

- *When removing the suspension strut, make sure that the CV joint boot is not damaged.*
- *Servicing suspension strut* ⇒ *page 40-44* .

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Installing

- Install suspension strut.

- Hole in spring plate (arrow) faces toward middle of vehicle.

CAUTION!

The bonded rubber bushings can only be turned to a limited extent. The bolted connections between the suspension strut and the lower track control links should therefore only be tightened when the vehicle is standing on the ground.

- Bolt suspension strut to track control link and tighten new nut -1-.

  Tightening torque: 90 Nm (66 ft lb)

- Insert both upper control links into wheel bearing housing and tighten new nut -2-.
  - Tightening torque: 40 Nm (30 ft lb)
  - Upper link joint with collar must be pushed onto wheel bearing housing as far as possible when installing.
- Tighten nut at ball joint.
  - Tightening torque: 100 Nm (74 ft lb)
  - If necessary, counterhold ball joint using 4 mm hex wrench

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- Insert ABS wheel speed sensor wire into holder at brake caliper.

- Install new nuts for both suspension struts and tighten to 20 Nm (15 ft lb).

CAUTION!

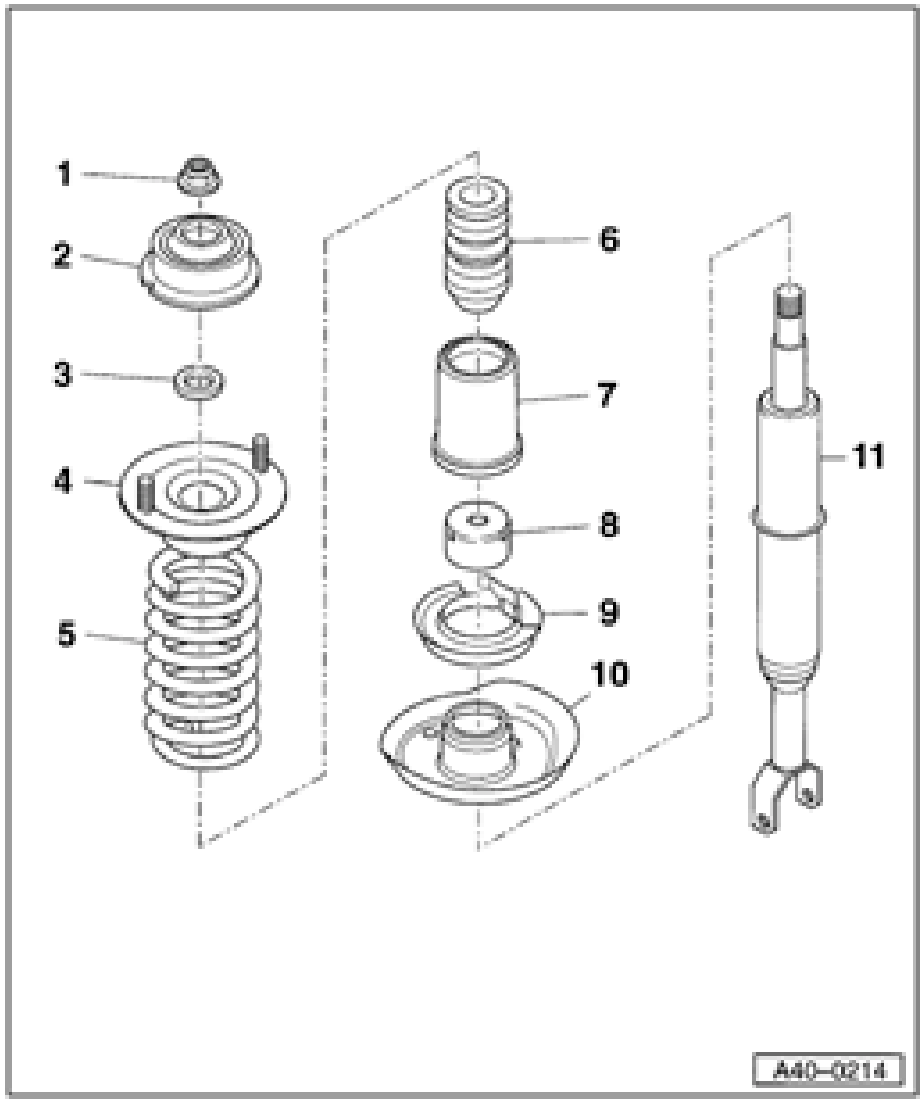
Be careful not to damage the surface of the brake lines.

- Re-install rubber grommets into plenum chamber.

- Install wheel and tighten bolts to 120 Nm (89 ft lb).

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Suspension strut, servicing

1 - Nut

- Always replace
- 60 Nm (44 ft lb)

2 - Suspension strut mount

3 - Washer

4 - Upper spring plate

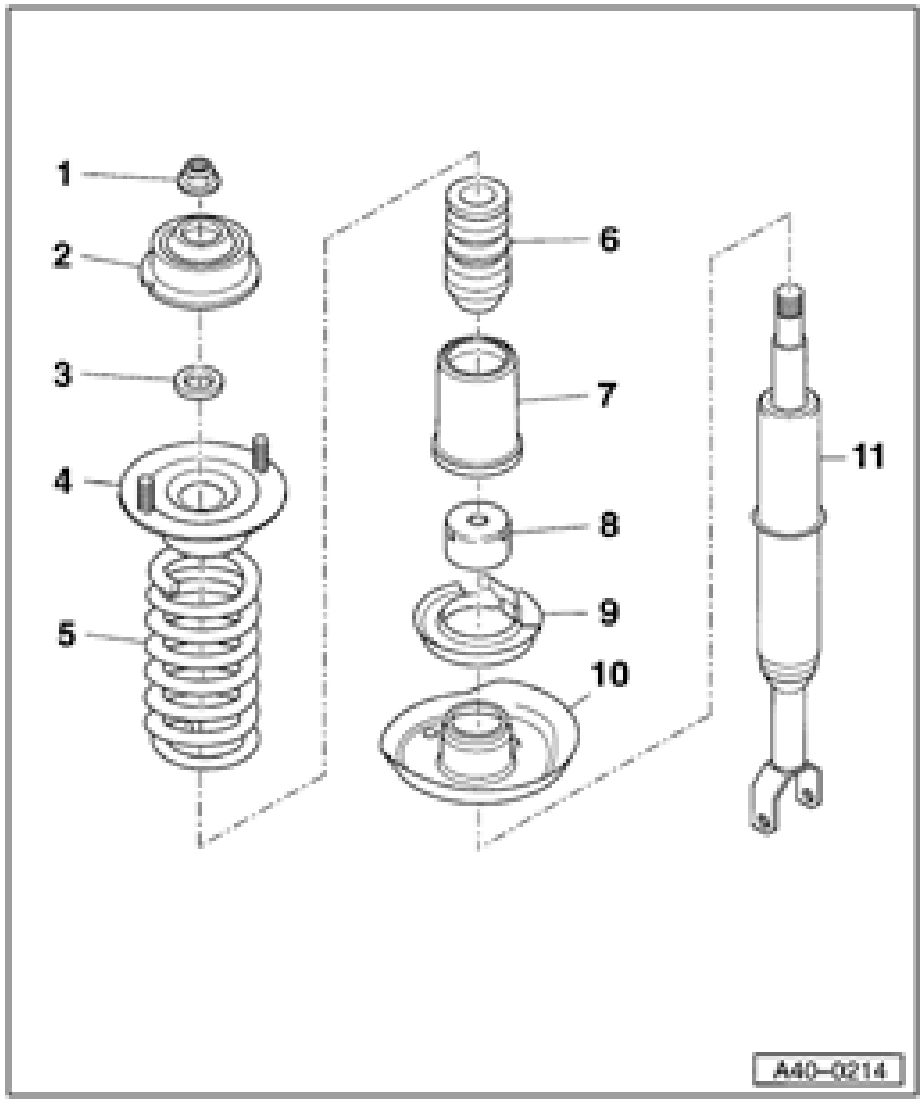
- Installation position ⇒ Fig. 8
- Installing ⇒ Fig. 7
- Both steel and aluminium versions
- Do not mix steel and aluminium versions

5 - Coil spring

- Be careful not to damage surface of coil spring
- Observe color coding
- Removing ⇒ Figs. 1 , ⇒ 2 and ⇒ 3
- Installing ⇒ Figs. 6 and ⇒ 9
- Observe different versions, refer to vehicle data label ⇒ page 40-46

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6 - Stop buffer

- Insert into upper spring plate

7 - Protective sleeve

8 - Protective cap

9 - Lower spring base

- Fixed with recess in bead at spring plate

10 - Lower spring plate

- Installation position ⇒ Fig. 5

11 - Shock absorber

- Replacing ⇒ Fig. 4
- Allocation ⇒ parts catalog microfiche
- Checking shock absorber for leaks and noises ⇒ Special Information, binder

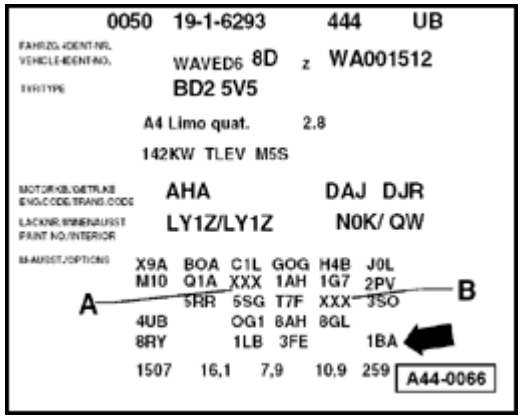
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40-46

Information on weight codes (code number)

From model year 1998 ➢, spring/shock assemblies will be classified according to weight codes (code number) so that suspension components can be matched easily.

The spring/shock assemblies installed in the vehicle is indicated by the weight code on the vehicle data label.



➢ **Example of vehicle data label**

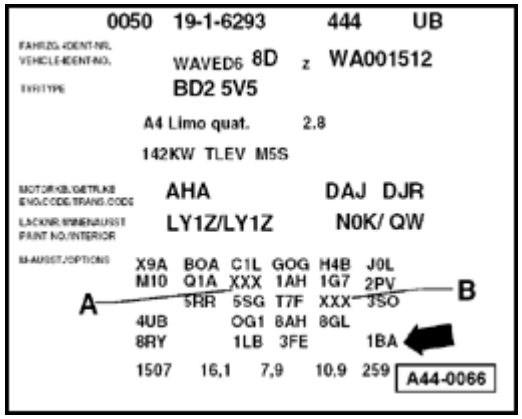
A - Weight code for front suspension

B - Weight code for rear suspension

The vehicle data label is located in the spare wheel well and in the vehicle Maintenance booklet.

The weight codes can be used to identify the correct spring/shock assemblies on the parts catalog microfiche.

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The weight code for the different suspension versions is indicated by the arrow in the illustration.

- 1BA: Standard suspension
- 1BE: Sport suspension
- 1BB: Heavy duty suspension (approx. 20 mm or 0.79 in. higher)
- 1BC: Special purpose vehicles
- 1BD: Sport suspension, Audi S4
- 1BH: USA
- 1BT: Heavy duty suspension (approx. 7 mm or 0.28 in. higher)
- 1BP: Heavy duty suspension (ride height same as 1BA but with limited bump)

Special tools, test equipment and auxiliary items

VAG1752/1	VAG1752/2	VAG1752/7
VAG1752/28	3353	

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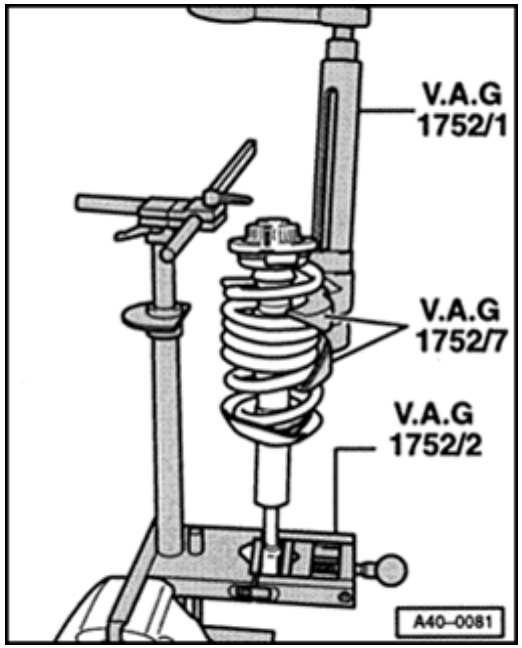


Fig. 1 Removing coil spring

- Clamp VAG1752/2 spring mounting tool in vise.
- Clamp forked end of suspension strut in VAG1752/2 spring mounting tool.

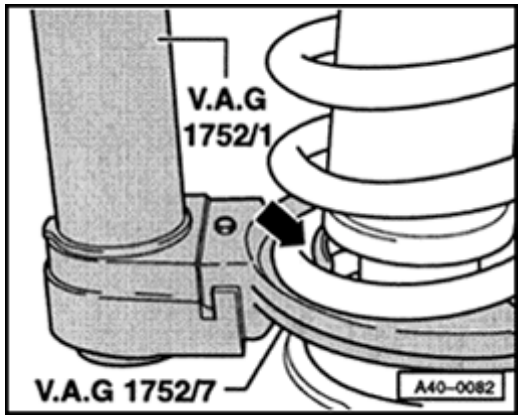


Fig. 2 Removing coil spring, continued

- Using VAG1752/1 tensioning device, compress coil spring until upper spring plate is free.

WARNING!

Make sure coil spring is properly seated in VAG1752/7 spring holder (arrow).

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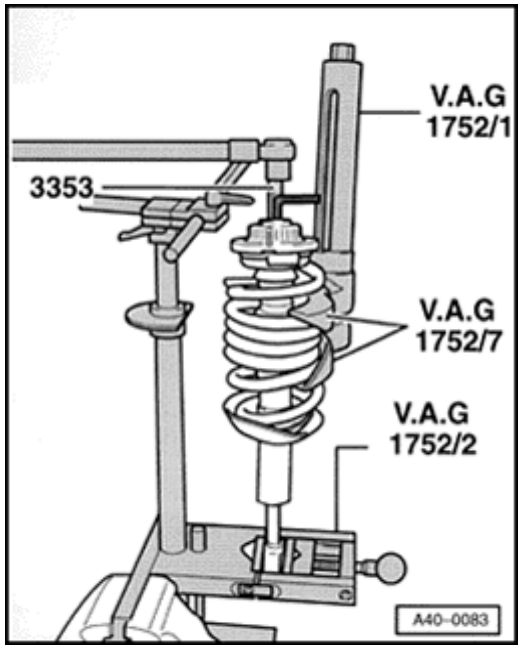


Fig. 3 Removing coil spring, continued

- Remove nut from piston rod (counter-hold with hex wrench).
- Using VAG1752/1 tensioning device, remove components of suspension strut and compressed coil spring.

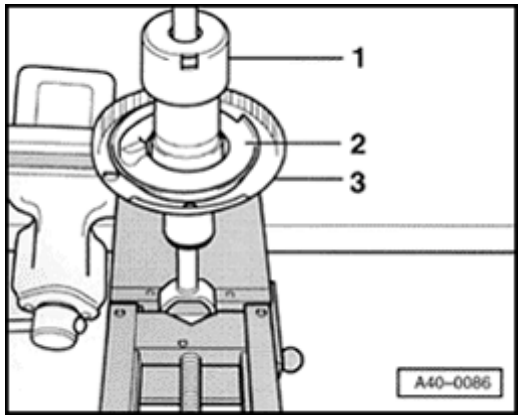


Fig. 4 Replacing shock absorber

The following steps are required to remove the shock absorber:

- Remove protective cap -1- and lower spring base -2-.
- Using plastic hammer, loosen and remove lower spring plate -3-.

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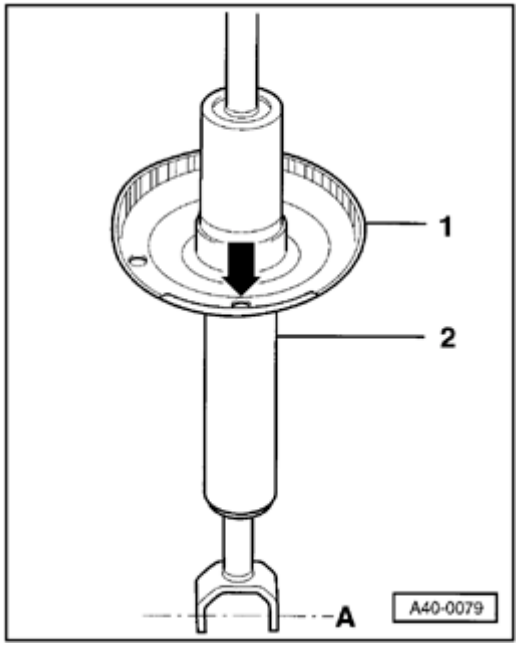


Fig. 5 Installation position of lower spring plate

- Make sure lower spring plate is correctly positioned before installing coil spring:
  - ♦ Hole (arrow) in spring plate -1- should be perpendicular (90 °) to bolt axis -A- of shock absorber -2-
  - ♦ Allowable deviation: ± 2 °

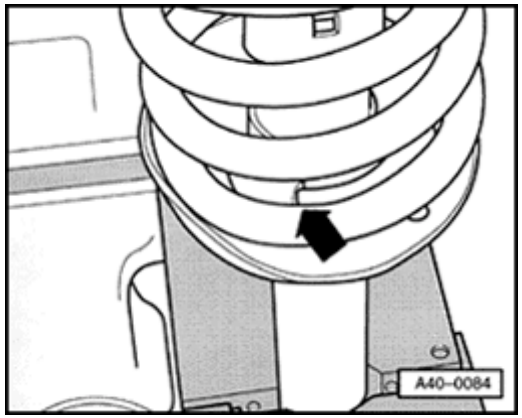


Fig. 6 Installing coil spring

The lower spring support is located by a recess in the spring plate.

- Install protective cap and stop buffer.
- Install coil spring onto lower spring base using VAG1752/1 tensioning device.
  - • End of coil spring must lie against stop (arrow)

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40-51

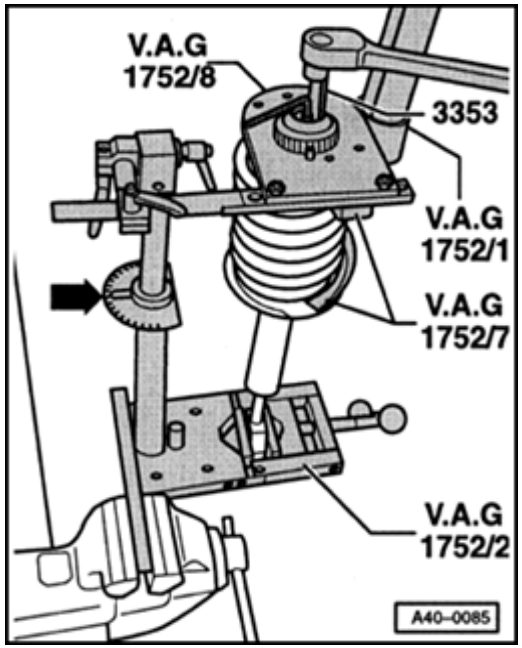


Fig. 7 Installing upper spring plate

- Set angle scale (arrow) on VAG1752/2 spring mounting tool to 0°.
- Install upper spring plate, washer and suspension strut mount.
- Using VAG1752/8 adjustment gauge for struts, position upper spring plate to 11°.

  The 11° position on the adjustment gauge is indicated by "left-front" or "right-front"

The 11° positions on the spring plates are always mirror images on the left and right-hand sides.

Installation position of upper spring plate ⇒ Fig. 8 .

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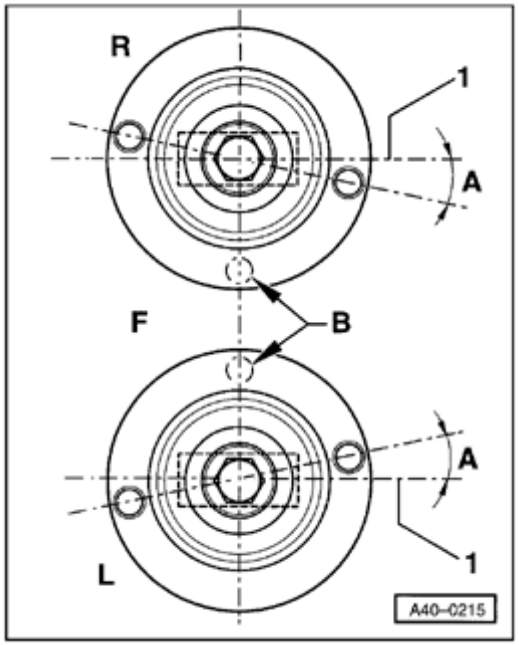


Fig. 8 Installation position of upper spring plate

A - 11° ± 2°

F - Direction of travel

L - Spring plate on left-hand side

R - Spring plate on right-hand side

The studs in upper spring plate are offset 11° to the bolt axis -1- of the forked end of the shock absorber.

Holes -B- in the lower spring plates face the center of the vehicle.

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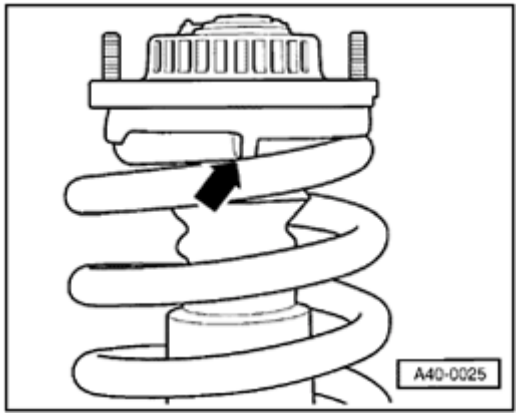


Fig. 9 Installing coil spring

- End of spring must lie against stop on upper spring plate (arrow)

- Install new nut using 3353 specialty socket wrench.

  Tightening torque: 60 Nm (44 ft lb)

- Relieve tension on coil spring.
- Remove VAG1752/8 adjustment gauge for struts.

When installed correctly, the upper and lower spring plates should be parallel to each other.

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Wheel bearing housing, removing and installing

Removing

- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap.

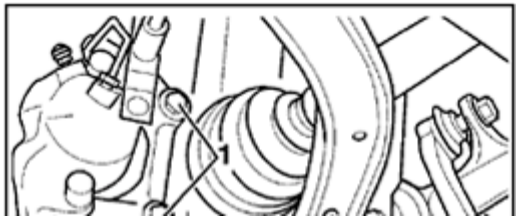
- Remove bolt for drive axle.

WARNING!

The vehicle must be standing on it's wheels when loosening or tightening the bolt for the drive axle. Otherwise the risk of an accident exists.

- Remove wheel and secure brake disc using wheel bolt.

- Detach ABS wheel speed sensor wire from bracket on brake caliper.



- Remove bolts -1- for brake caliper and remove caliper.

CAUTION!

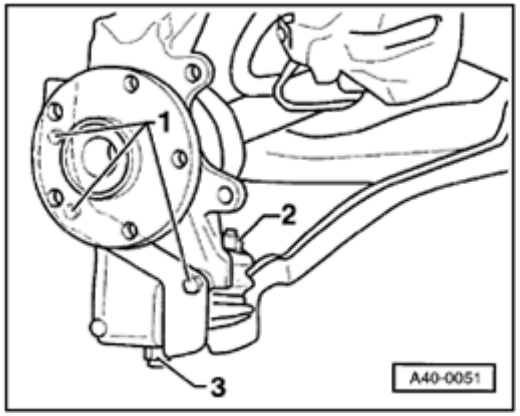
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- ***Suspend the brake caliper using a piece of wire. Do not allow the caliper to hang by the brake hose. The unsupported weight can stretch and damage the hose.***
- ***Do not loosen brake hoses or lines.***

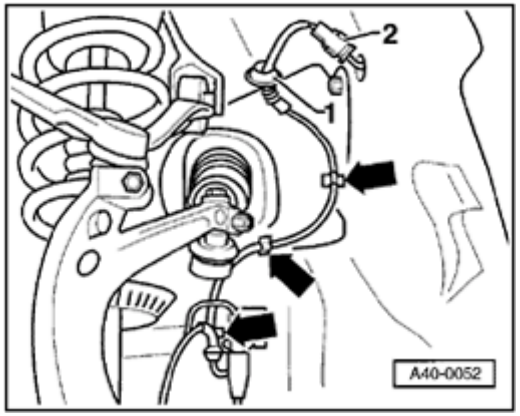
- Remove brake disc.

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40-55



- Remove bolts -1- for brake splash guard.
- Pull ABS wheel speed sensor out of wheel bearing housing.
- Loosen nuts -2- and -3-.

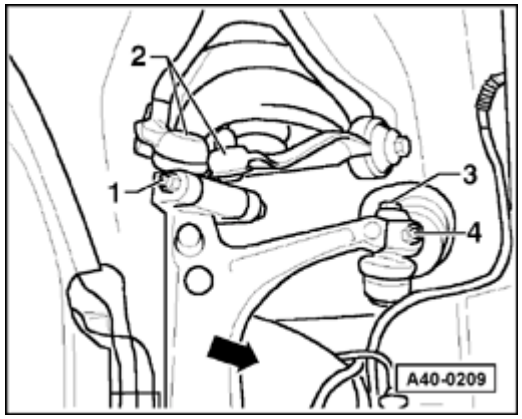


- Pull out rubber grommet -1- and disconnect harness connector -2-.
- Detach ABS wheel speed sensor wiring from retainers (arrows).
- Guide wiring through opening in wheel bearing housing and remove.

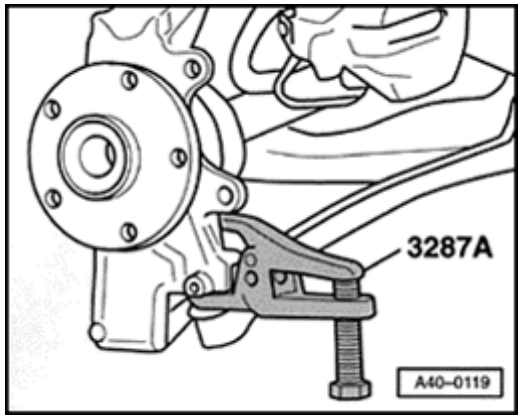
  Be careful not to damage the rubber grommet.

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- Remove bolt -3- and nut -4-.
- Disconnect tie rod end.
- Loosen nut from ball joint
  - If necessary, counterhold ball joint using 4 mm hex wrench.



- Press lower guide link ball joint from tapered seat.

  Be careful not to damage the joint boot.

Note:

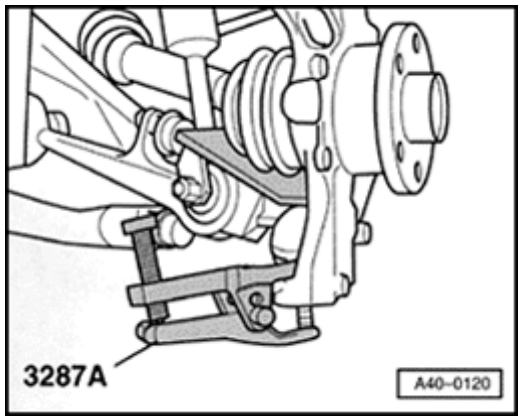
For vehicles with headlight range control ⇒ page 40-14 .

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40-57

Note:

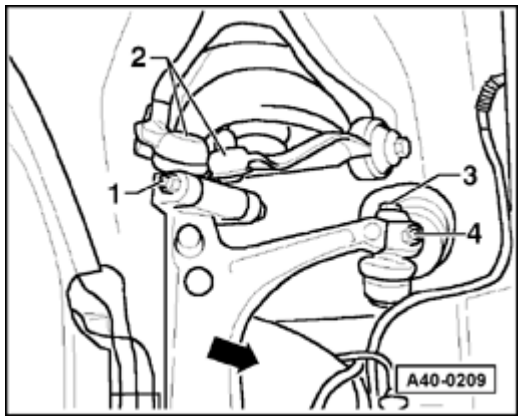
Cover the CV joint boot (e.g. by inserting a piece of leather) to protect it from damage.



- Press lower track control link ball joint from tapered seat.

CAUTION!

For safety reasons, reinstall the flanged nut onto the lower track control link ball joint (approx. 4 turns).



- Remove nut -1- and bolt and remove both links -2- upward.

CAUTION!

Do not use a chisel (or similar) to widen the slots in the wheel bearing housing.

- Swing wheel bearing housing aside in direction of arrow and remove outer CV joint from wheel hub.
- Remove nut from lower track control link ball joint.
- Remove wheel bearing housing.

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Installing

- Install wheel bearing housing.

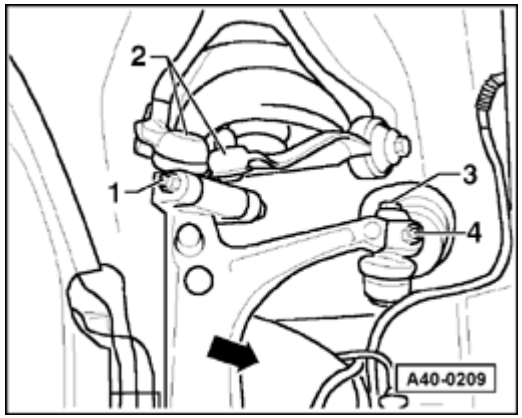
- Slide drive axle outer CV joint into wheel hub and tighten new bolt hand tight.

- Install ball joints for lower track control link and and guide link in wheel bearing housing.

- Install new self-locking nuts and tighten to: 100 Nm (74 ft lb).

  - If necessary, counterhold ball joint using 4 mm hex wrench.

- Install both upper link ball joints into wheel bearing housing.



- Install new self-locking nut -1- and tighten to 40 Nm (30 ft lb).

  - Press upper links downward as far as possible when tightening.

- Install tie rod end and new self locking nut -4-.

  Tightening torque: 50 Nm (37 ft lb)

- Tighten bolt -3-.

  Max tightening torque: 5 Nm (44 in. lb)

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- Install ABS wheel speed sensor.

- Attach linkage for headlight range control ⇒ page 40-14 .

- Bolt on brake splash guard.

  Tightening torque: 10 Nm (7 ft lb)

- Install brake disc.

- Install brake caliper and tighten bolts to 120 Nm (89 ft lb).

- Install wheels and tighten wheel lugs to 120 Nm (89 ft lb).

- Install new bolt for drive axle.

  Tightening torques:

  - M14: 115 Nm (85 ft lb) + 1/2-turn (180°)
  - M16: 190 Nm (140 ft lb) + 1/2-turn (180°)

WARNING!

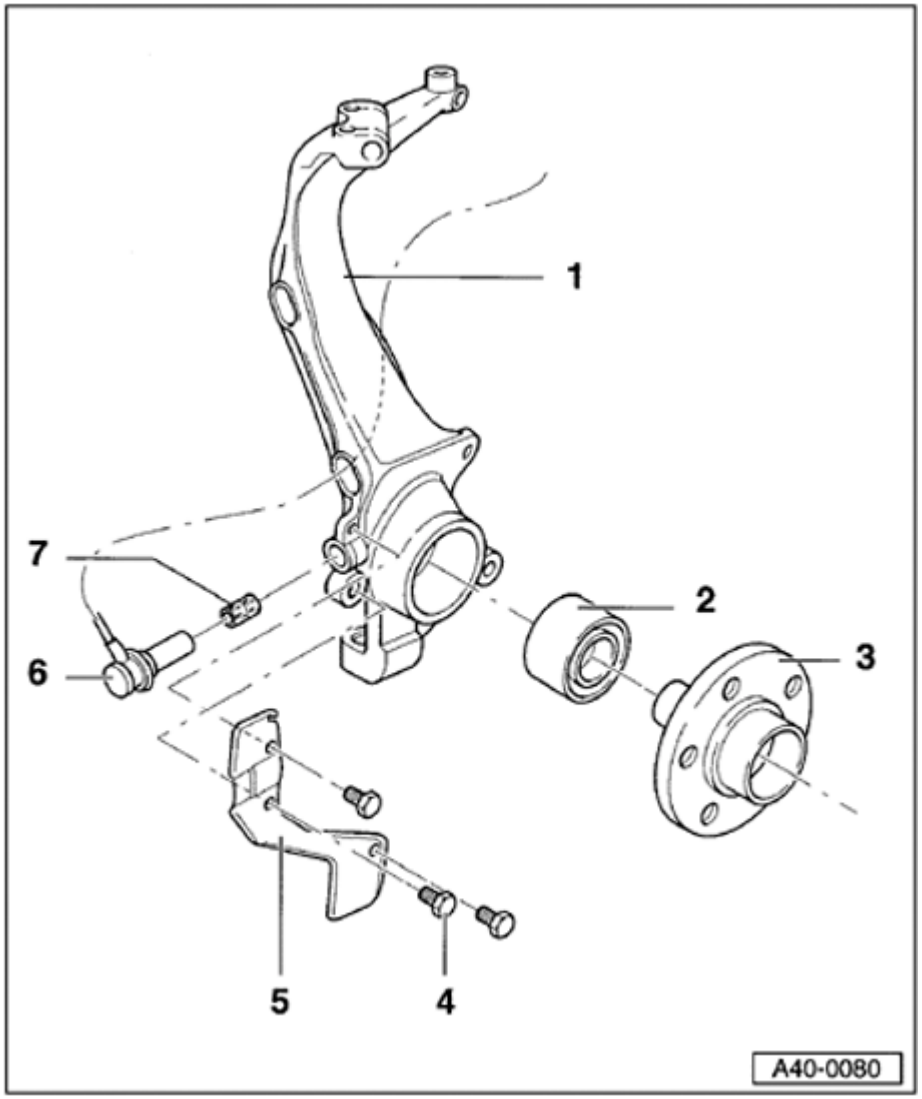
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The vehicle must be standing on it's wheels when loosening or tightening the bolt for the drive axle. Otherwise the risk of an accident exists.

- Check front suspension alignment and, if necessary, adjust using VW/Audi approved alignment equipment.

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Wheel bearing housing, servicing

1 - Wheel bearing housing

- Note different versions of suspension ⇒ parts catalog microfiche
- Removing and installing ⇒ page 40-54

2 - Wheel bearing

- Shoulder on inner diameter
- Installation position: side of wheel bearing with larger inner diameter faces wheel hub
- Removing bearing inner race from hub ⇒ Fig. 5 and Fig. ⇒ 6

With 75 mm diameter wheel bearing housing:

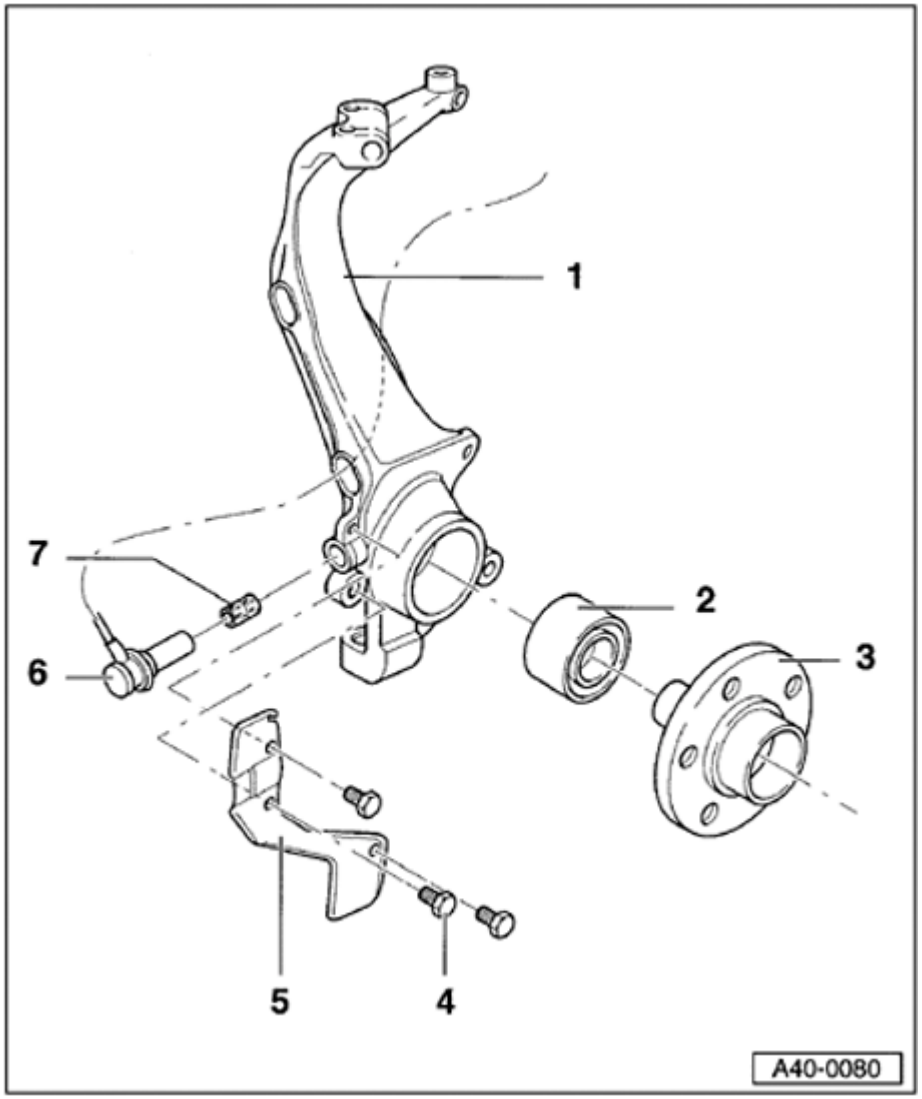
- Pressing bearing out ⇒ Fig. 3
- Pressing bearing in ⇒ Fig. 7

With 82 or 85 mm diameter wheel bearing housing:

- Pressing bearing out ⇒ Fig. 4
- Pressing bearing in ⇒ Fig. 8

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3 - Wheel hub

- Shouldered

With 75 mm diameter wheel bearing housing:

- Pressing hub out ⇒ Fig. 1
- Pressing hub in ⇒ Fig. 9

With 82 or 85 mm diameter wheel bearing housing:

- Pressing hub out ⇒ Fig. 2
- Pressing hub in ⇒ Fig. 10

4 - Bolt

- 10 Nm (7 ft lb)

5 - Brake splash guard

6 - ABS wheel speed sensor

- Pull out to remove
- Install drive axle before installing speed sensor
- Press into clamping sleeve up to stop
- Routing wiring ⇒ page 40-55

7 - Clamping sleeve

- Always replace

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- Left and right sides identical
- Before installing, lubricate hole in wheel bearing housing with brake cylinder paste
- Press into wheel bearing housing up to stop

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Special tools, test equipment and auxiliary items

VW401	VW402	VW412
VW416B	VW519	VW407
VW432	VW447I	3291/2
3124	3345	30-100
Separating device Kukko 15-17		3005

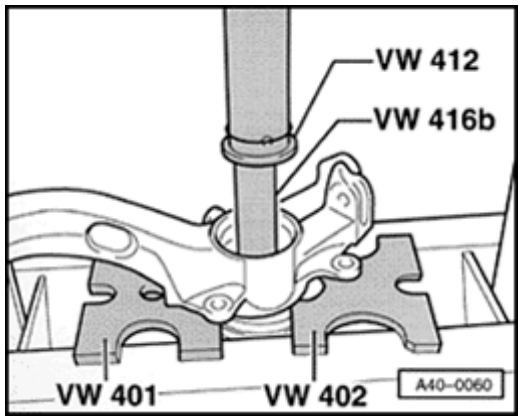


Fig. 1 Pressing wheel hub out of 75 mm diameter wheel bearing housing

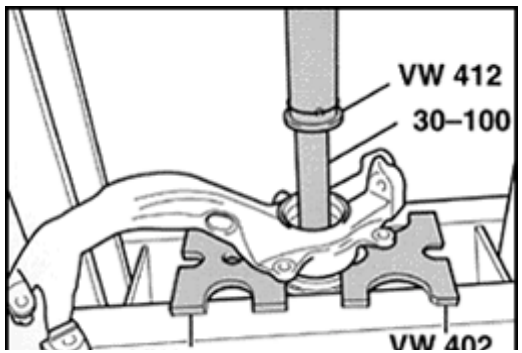


Fig. 2 Pressing wheel hub out of 85 mm diameter wheel bearing housing

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40-63

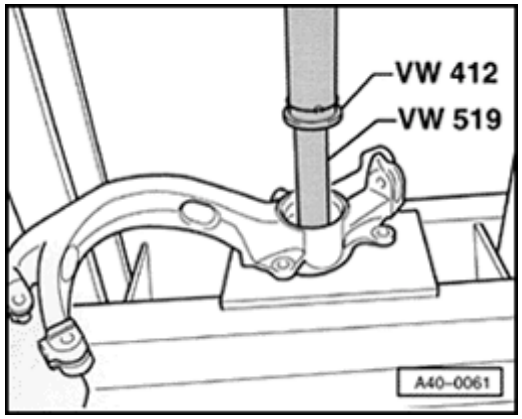


Fig. 3 Pressing wheel bearing out of 75 mm diameter wheel bearing housing

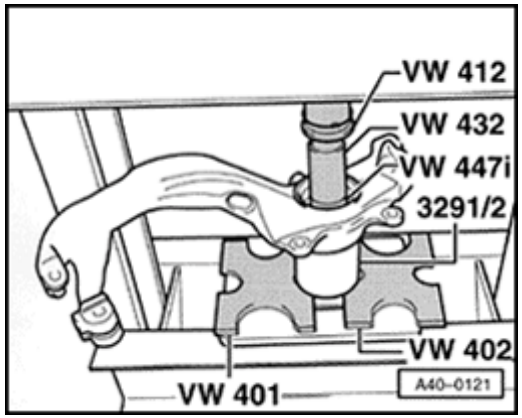


Fig. 4 Pressing wheel bearing out of 85 mm diameter wheel bearing housing

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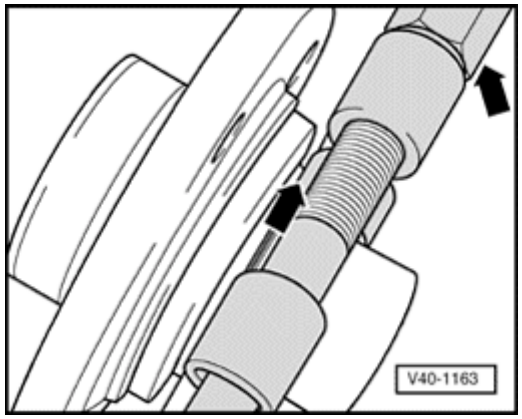


Fig. 5 Installing separating device

- Install separating device into bearing inner race circumferential groove (left arrow) and tighten spindle (right arrow).

Note:

Use a standard, commercially available bearing separator (i.e. Kukko 15-17).

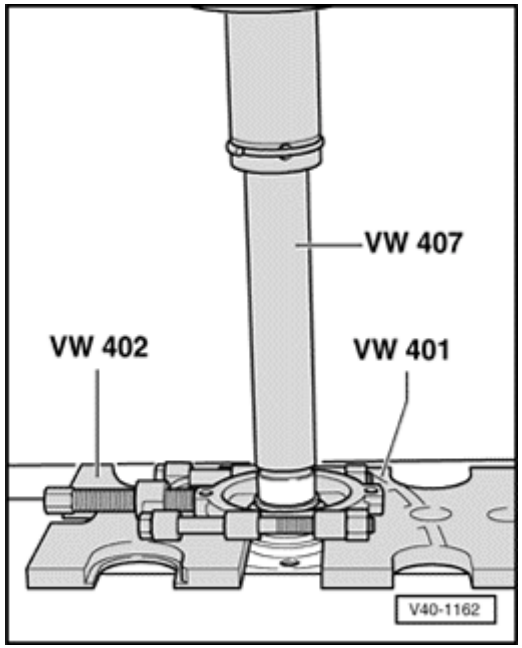


Fig. 6 Pressing inner bearing race off of wheel hub

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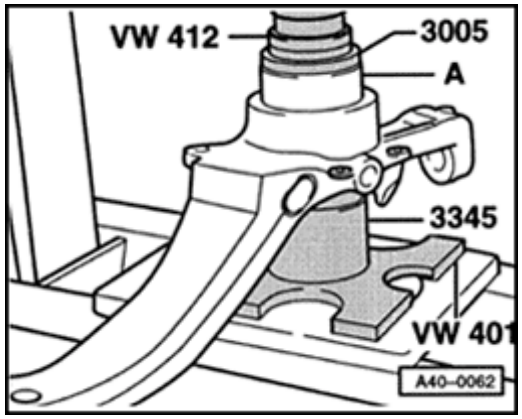


Fig. 7 Pressing wheel bearing into 75 mm diameter wheel bearing housing

Note:

Large inner diameter of wheel bearing faces toward wheel hub.

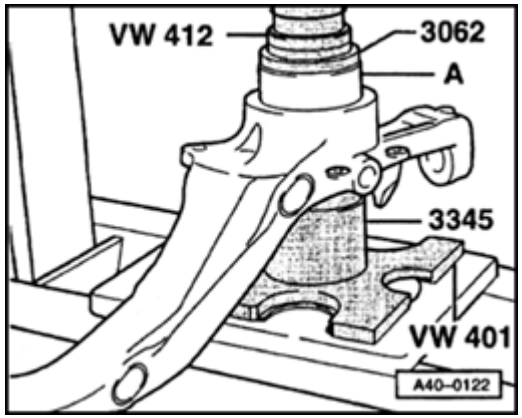


Fig. 8 Pressing wheel bearing into 85 mm diameter wheel bearing housing

Note:

Large inner diameter of wheel bearing faces toward wheel hub.

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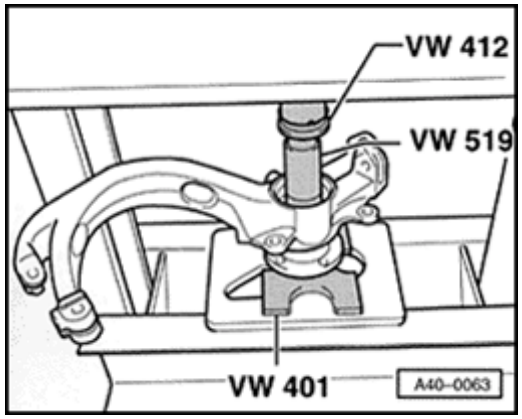


Fig. 9 Pressing wheel hub into 75 mm diameter wheel bearing

CAUTION!

- ***When installing, VW519 sleeve must exert force only against the bearing inner race.***
- ***Make sure that the wheel bearing housing does not exert force against the wheel hub. Otherwise there is the risk of damaging the wheel bearing.***
- ***The wheel bearing housing must remain as horizontal as possible when pressing in the hub. Otherwise the wheel hub will cant in the wheel bearing, which will lead to early wheel bearing damage.***

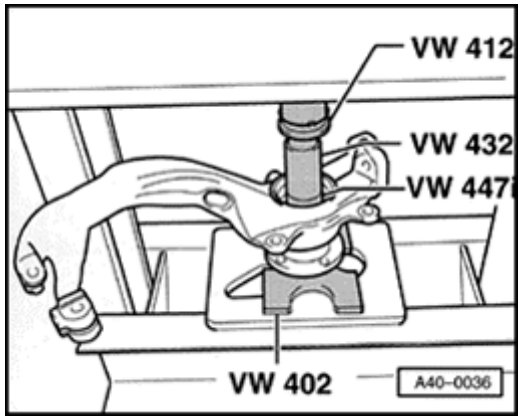


Fig. 10 Pressing wheel hub into 85 mm wheel bearing

CAUTION!

- ***When installing, VW447i thrust pad must only exert force only against the bearing inner race.***
- ***Make sure that the wheel bearing housing does not exert force against the wheel hub. Otherwise there is the risk of damaging the wheel bearing.***
- ***The wheel bearing housing must remain as horizontal as possible when pressing in the hub. Otherwise the wheel hub will cant in the wheel bearing, which will lead to early wheel bearing damage.***

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Wheel bearing housing, servicing with VAG1459 B

There is an alternative to using the VAG1290 A workshop press to service the wheel bearing housing. VAG1459 B hydraulic wheel bearing and wheel hub removal and installation tool together with the VAG1459 B/2 accessory can be used instead.

Advantages:

- Wheel bearing housing does not need to be completely disassembled.
- Tie rod end remains in wheel bearing housing and therefore wheel alignment does not need to be carried out.

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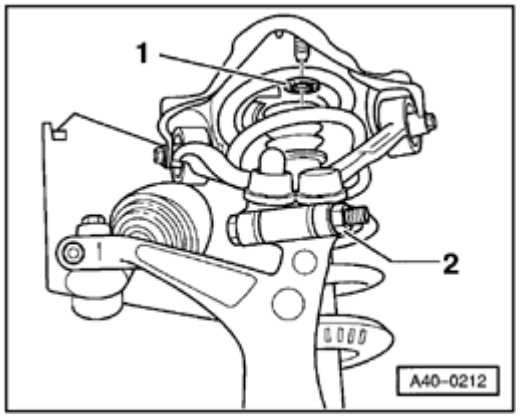
Mounting bracket, removing and installing

Removing

- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap.

- Remove wheel.



- Use pliers to remove clip -1-.

Note:

The clip does not need to be reinstalled.

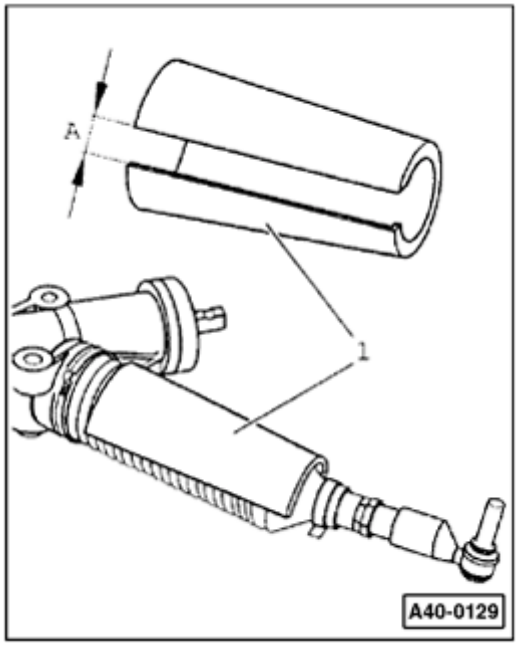
- Remove nut -2- and bolt.
- Pull both control arms upward and out.

CAUTION!

Do not use a chisel (or similar) to widen the slots in the wheel bearing housing.

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- Cover steering gear boot to protect from damage.

Note:

- *The illustration shows the steering gear removed for clarity.*
- *Protective sleeve -1- can be ordered (Part No. 893 512 137).*

CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

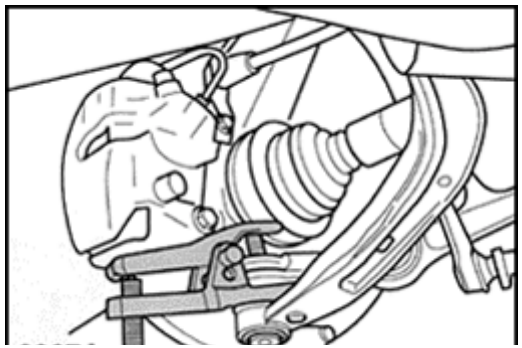
- Cut out part of sleeve -1- and de-burr cut edges.

  Width -A- = 20-25 mm (approx. 7/8 to 1 in.)

- Slide protective sleeve over steering gear boot.

  • Open side of sleeve must face downward

To remove the bolt mounting the suspension strut to the lower track control link, the lower guide link must first be disconnected from the wheel bearing housing.



- Remove nut from guide link ball joint and press off ball joint.
  - If necessary, counter-hold ball joint using 4 mm hex wrench.
  - Be careful not to damage boot.

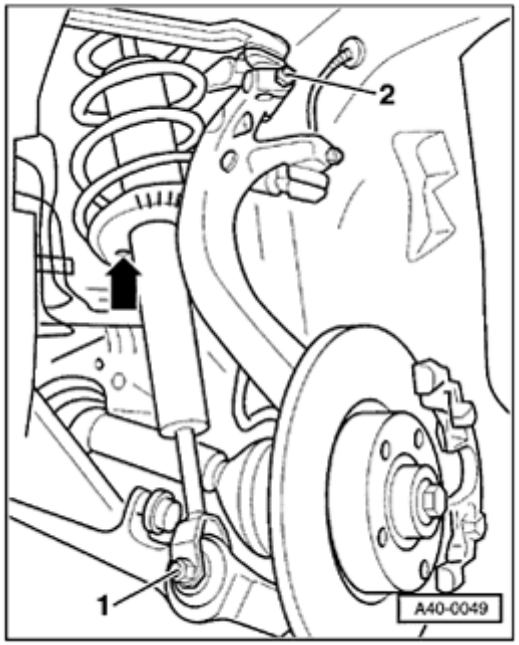
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- Detach ABS wheel speed sensor wire from bracket on brake caliper.

CAUTION!

Install a support device (e.g. VAG1383A transmission jack) to prevent damage to the lower link joints resulting from excessive rebound travel in the suspension.



- Remove bolt -1- attaching suspension strut to lower track control link.
- Swing wheel bearing housing aside.



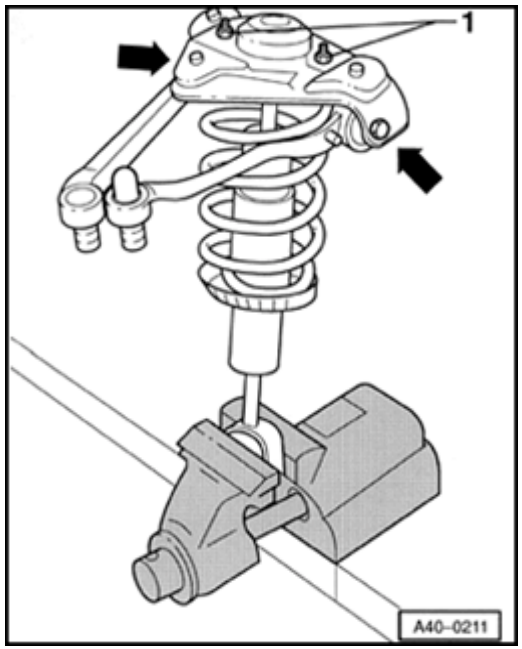
- Remove bolts -1- in plenum chamber.
- Remove suspension strut together with mounting bracket.

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Be careful not to damage boot.

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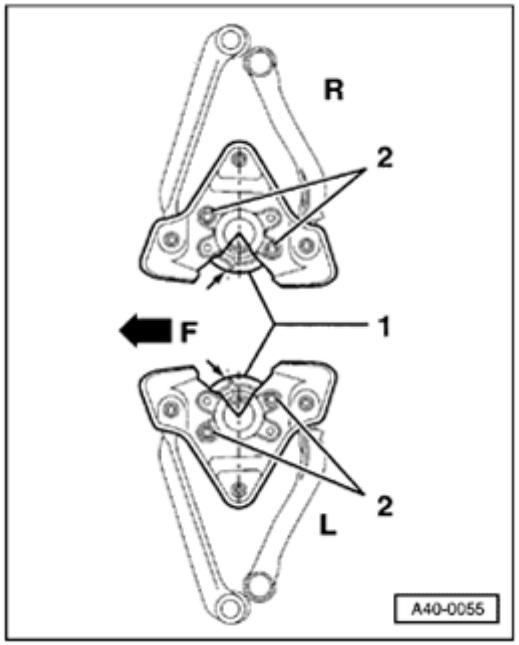
Removing upper links from mounting bracket

- Clamp suspension strut in vise (use protective jaw covers).
- Remove bolts and detach both links (arrows).
- Remove nuts -1- and remove mounting bracket.

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Installing



F - Forward

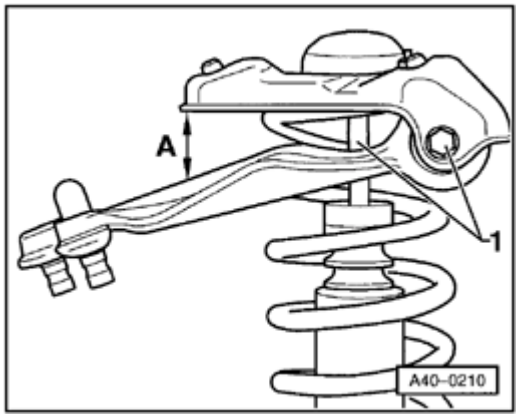
L - Left-side mounting bracket

R - Right-side mounting bracket

- Holes in suspension strut spring plate (small arrows) must face centerline of vehicle.

- Tighten nuts -2- to 20 Nm (15 ft lb).

Installing upper links to mounting bracket



- Align upper link.

  Dimension -A-: 47 mm ± 2 mm (1.85 in. ± 0.08 in.)

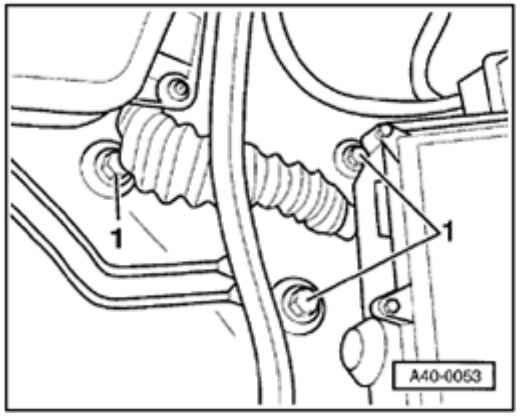
- Always replace nuts and bolts.

- Tighten bolts -1- for both links.

  Tightening torque: 50 Nm (37 ft lb) + 1/4-turn (90°)

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40-73



- Install suspension strut together with mounting bracket into suspension strut tower and tighten bolts -1-.

  Tightening torque: 75 Nm (48 ft lb)

Note:

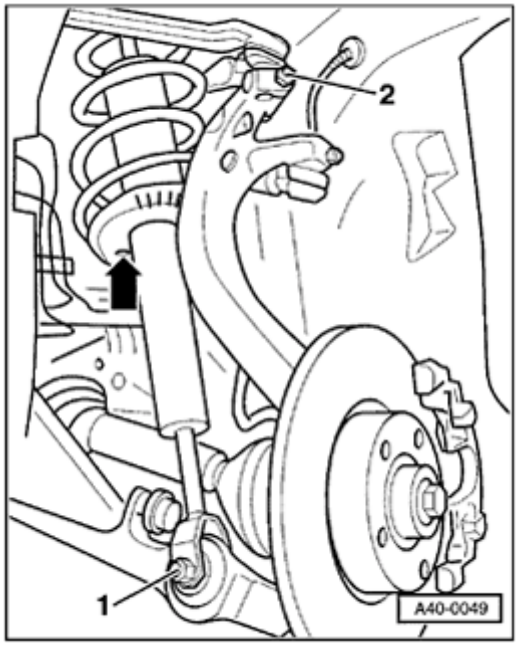
Make sure the washers are correctly positioned.

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CAUTION!

The bonded rubber bushings can only be turned to a limited extent. The bolted connections on the suspension links should therefore only be tightened when the vehicle is standing on the ground.



- Attach lower end of suspension strut to lower track control link with bolt and new nut and tighten nut -1- to 90 Nm (66 ft lb).
- Remove any residue from threads of ball joint.
- Tighten nut on ball joint to 100 Nm (74 ft lb).
- Install both upper links and tighten nut -2-.
  - Tightening torque: 40 Nm (30 ft lb)
  - When tightening, press upper links downward as far as possible
- Attach ABS wiring to retainer on brake caliper.
- Install wheel.
- Check front suspension alignment and, if necessary, adjust using VW/Audi-approved wheel alignment equipment.

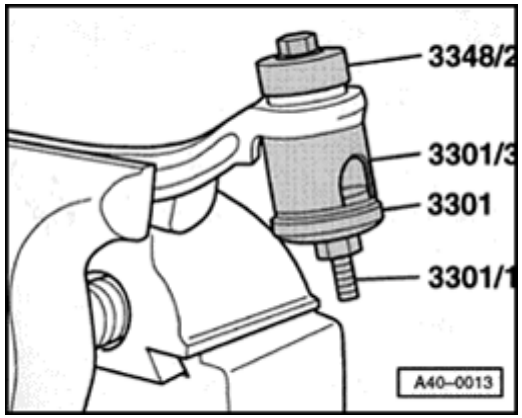
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Front and rear upper link bushings, replacing

The mounting bracket must be removed to replace the upper links or bushings ⇒ page 40-68 .

Special tools, test equipment and auxiliary items

3348/2	3301	3301/3
3301/1	3348/3	



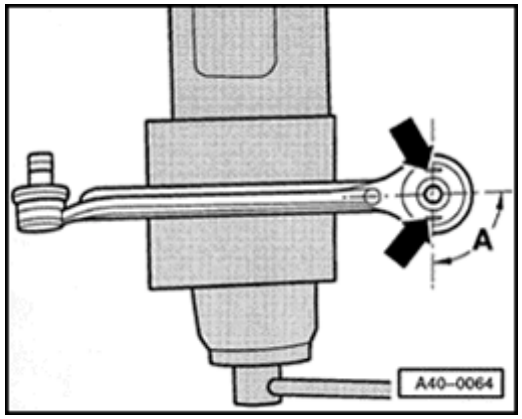
Pulling out bonded rubber bushing

Note:

Always use protective jaw covers when clamping an aluminium link in a vise.

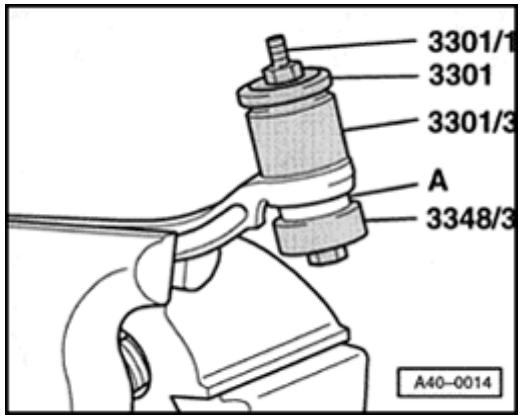
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40-76



Installation position

Angle -A-: 90° ± 5°



Installing bonded rubber bushing

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Subframe, removing and installing

WARNING!

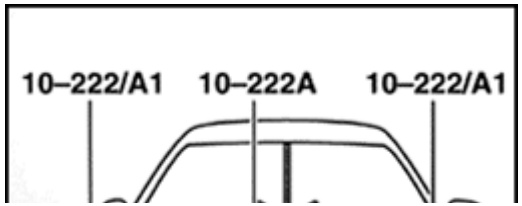
- ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

Special tools, test equipment and auxiliary items

10-222A Engine support bridge		10-222/1
3393		

Removing



- Support engine using engine support bridge.
- Remove wheel trim.

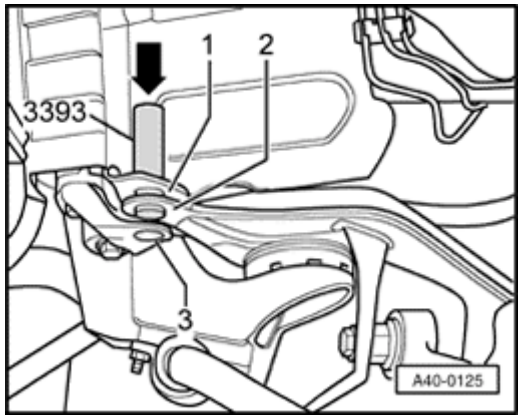
  On light alloy wheels use puller in vehicle tool kit to remove trim cap.

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- Remove wheels.
- Remove noise insulation panel.

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40-78



- Before loosening subframe, use 3393 testing mandrel to make sure that holes -1- and -2- are aligned.

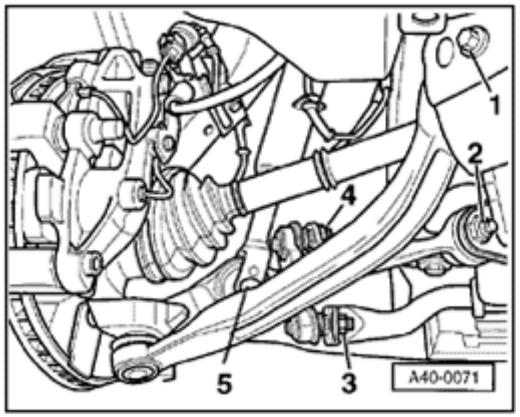
- If holes -1- and -2- are not aligned, carry out wheel alignment after installing subframe.

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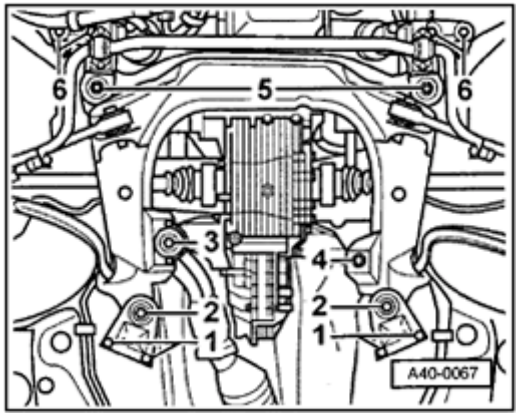
40-79

CAUTION!

Install a support device (e.g. VAG1383A transmission jack) to prevent damage to the lower link joints resulting from excessive rebound travel in the suspension.



- Remove nuts -3-.
- Loosen bolts -1- (attaching lower guide links to subframe).



- Remove bolts -1-.
- Remove bolts -2- and lower subframe at rear.

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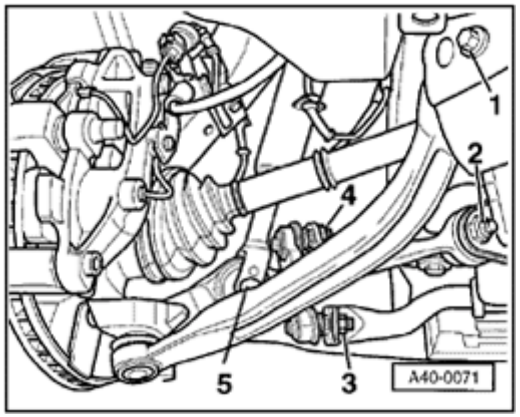
40-80

Note:

To prevent the outer joints on the lower track control link and guide link from being bent too far, secure the links to the car body using a piece of wire or similar.

- Remove bolts for lower guide links.

- Remove lower guide links from subframe.

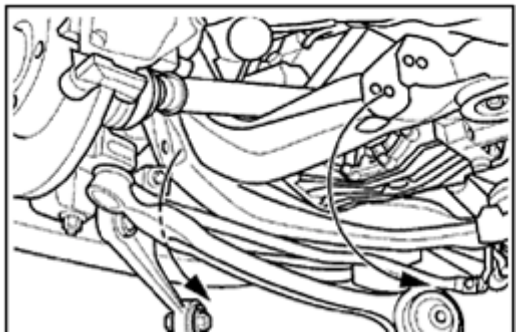


- Remove bolts -5-.

Note:

For vehicles with headlight range control ⇒ *page 40-14* .

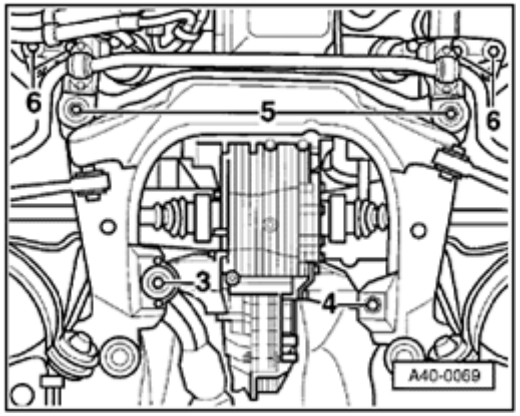
- Remove nuts -2- (attaching lower track control links to subframe) and remove bolts.
- Disconnect ABS wheel speed sensor wiring from retainers on brake calipers.



- Remove lower track control links from subframe.

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40-81



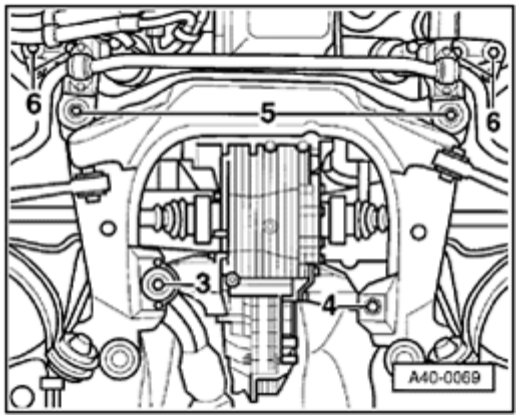
- Remove nuts -3- and -4-.
- Remove bolts -5-.
- Loosen bolts -6- until subframe can be removed.

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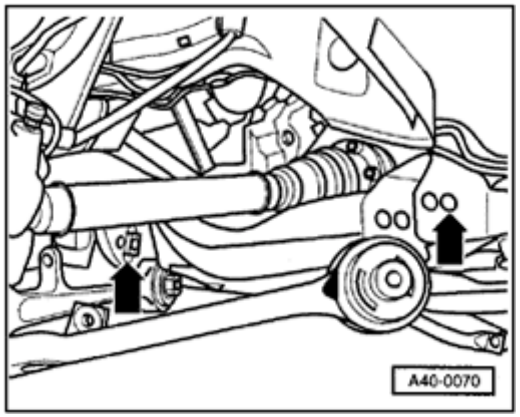
40-82

Installing

- All nuts and bolts must be replaced



- Install subframe; install bolts -5- and -6- hand-tight.
- Install bolts securing suspension struts to lower track control links.



- Install lower track control links and lower guide links in subframe.
  - Install bolts in inner holes (arrows).

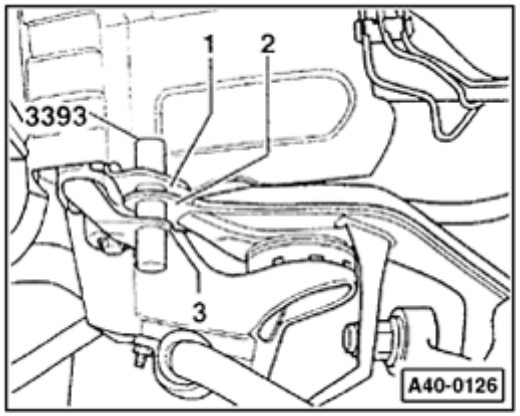
Note:

For vehicles with headlight range control ⇒ page 40-14 .

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40-83

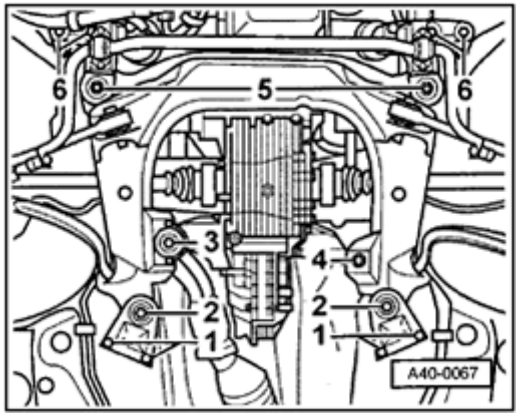
- Before tightening, 3393 testing mandrel must be installed to align subframe to body



- Hole -1-, subframe hole -2- and aluminium bracket hole -3- must align on both sides

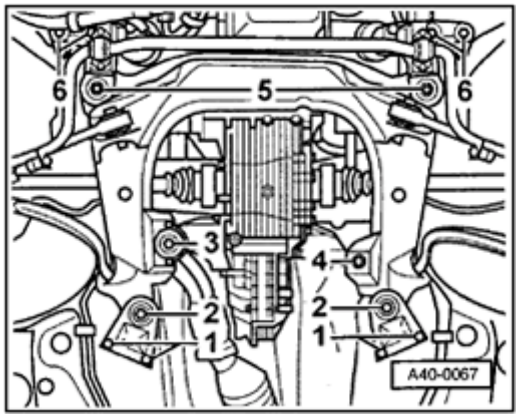
Notes:

- *When installing the complete subframe, the 3393 testing mandrel can be used to align the subframe to the body only if holes -1- and -2- were aligned before the repairs were made.*
- *If the 3393 testing mandrel is not used when installing the subframe or if holes -1- and -2- did not align before repairs were made a wheel alignment will need to be carried out.*



- Loosely install bolts -1- and -2-.
- Loosely install bolts -3- and -4-.
- Carry out corrosion protection measures, as needed, to holes used for 3393 testing mandrel.

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Tightening sequence

CAUTION!

The bonded rubber bushings can only be turned to a limited extent. The bolted connections on the suspension links should therefore only be tightened when the vehicle is standing on the ground.

- Tighten bolts -2- and -5- to 110 Nm (81 ft lb) + 1/4-turn (90 °).
- Tighten bolts -6- to 75 Nm (55 ft lb).
- Tighten bolts -1- to 23 Nm (17 ft lb).
- Tighten nuts -3- and -4- to 40 Nm (30 ft lb).
- Tighten bolts for lower track control link to 80 Nm (59 ft lb) + 1/4-turn (90 °).
- Tighten guide link bolts to 90 Nm (66 ft lb) + 1/4-turn (90 °).
- Attach coupling link to stabilizer bar using new ribbed nuts and tighten to 100 Nm (74 ft lb).
- Attach suspension strut to lower track control link.

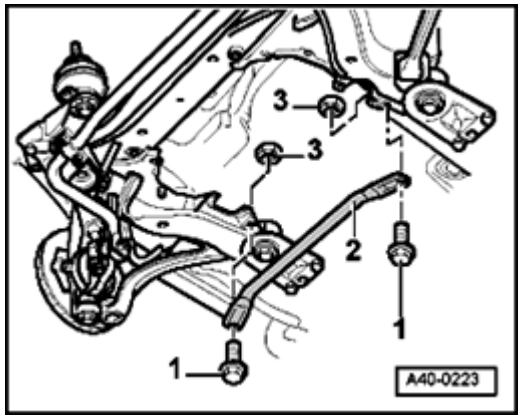
  Tightening torque: 90 Nm (66 ft lb)
- Install ABS wheel speed sensor wiring into retainer on brake caliper.
- Install wheels.

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40-85

Lower cross member, removing and installing

From m.y. 1998 ➢, various subframes (⇒ parts catalog microfiche) are equipped with a lower cross member.



➢

1 - Bolts M10 x 22

Tightening torque: 40 Nm (30 ft lb) +1/4-turn (90°)

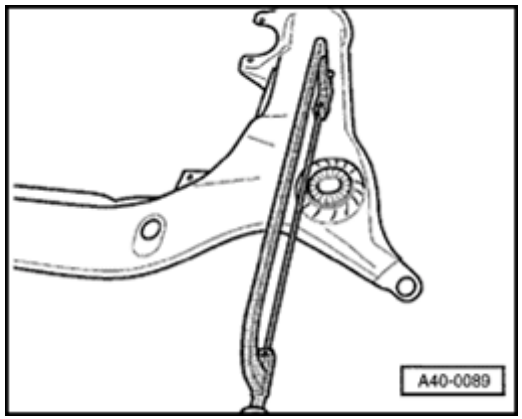
2 - Cross member

3 - Nuts

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40-86

Subframe bushings, replacing

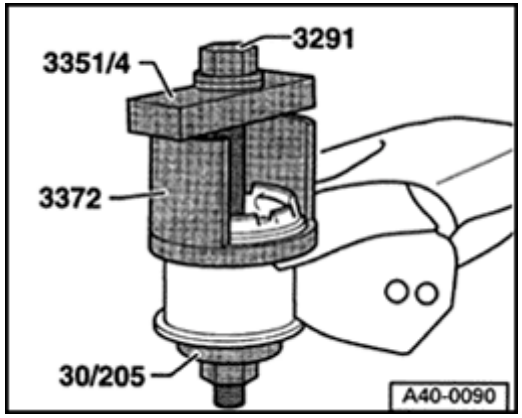


Removing bonded rubber mounts

- Saw or cut off rubber bead on subframe up to outer mounting bushing.

Note:

If the paint on the surface of the subframe is damaged, carry out corrosion protection measures.

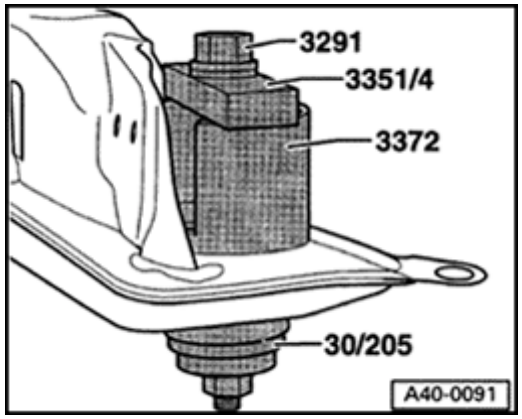


Pulling out rear bonded rubber mounts

- Make sure that 3372 installation device is properly positioned and cannot tilt.

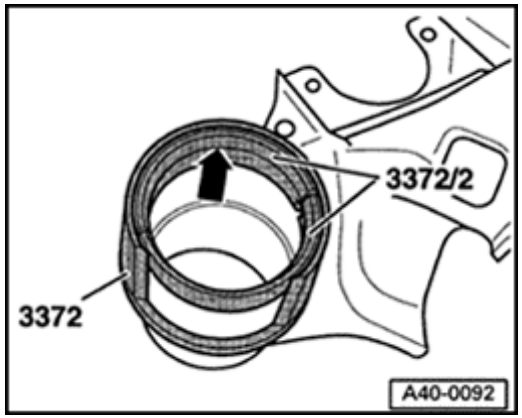
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40-87



Pulling out bonded rubber mounts

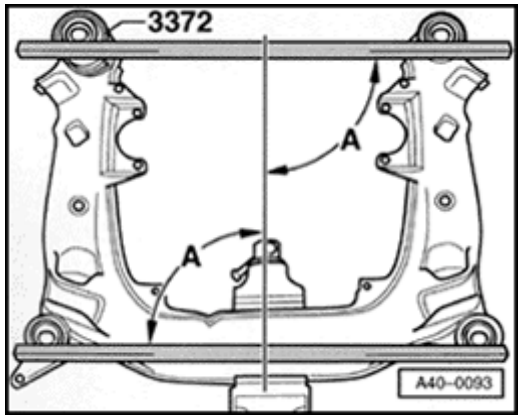
All of the bonded rubber subframe mounts are pulled out using the same tool.



Assembly preparations for pulling in subframe bonded rubber mounts

- Install installation device and insert 3372/2 thrust pieces.

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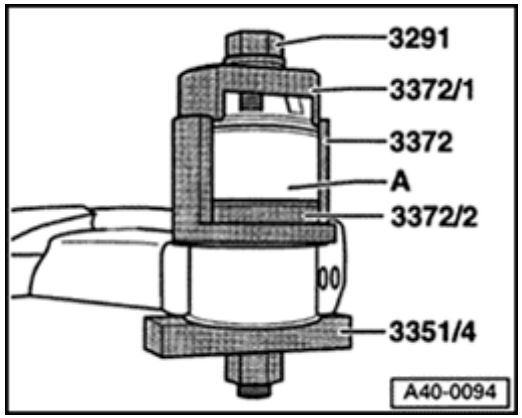
Aligning bonded rubber mounts

- Bonded rubber mounts must be aligned using a long rectangular tube or a straight-edge.

Angle -A-: 90° + 5°

Note:

Always use protective jaws when clamping the subframe in a vise.

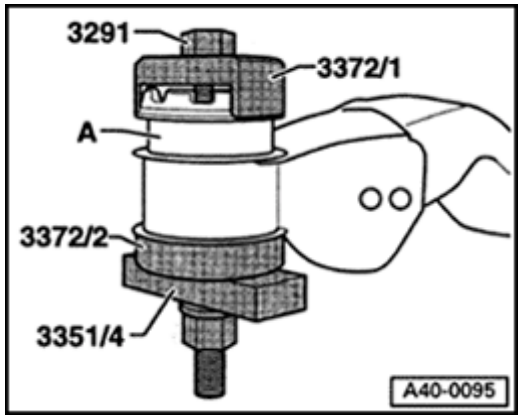


Pulling in rear bonded rubber mounts

- Use G 294 421 A1 lubricating oil when pulling in bonded rubber mounts.
- Pull in mount -A- until 3372/1 thrust piece aligns with upper edge of 3372 installation device.
- Remove 3372 installation device and 3372/2 thrust pieces upward.

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40-89

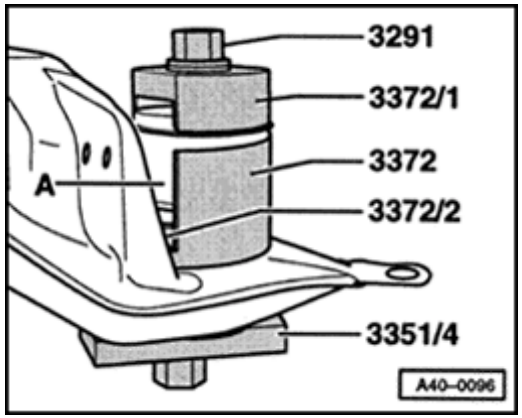


Pulling in rear bonded rubber mounts

- Install 3372/2 thrust pieces between 3351/4 bridge and subframe.
- Pull bonded rubber mount in up to stop.

Note:

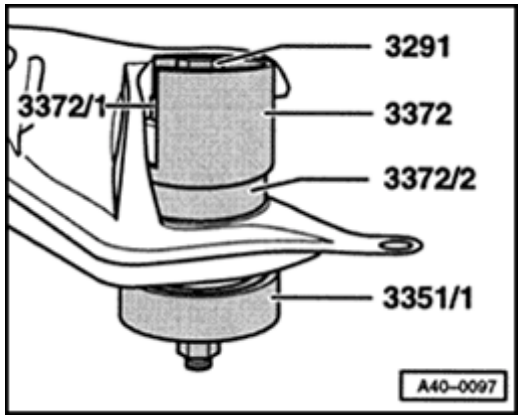
If the paint on the surface of the subframe is damaged, carry out corrosion protection measures.



Pulling in front bonded rubber mount

- Use G 294 421 A1 lubricating oil when pulling in bonded rubber mounts.
- Install 3372/2 thrust pieces into 3372 installation device.
- Pull in bushing -A- until 3372/1 press tool is flush with upper edge of 3372 installation device.

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Pulling in front bonded rubber mounts

- Lift 3372 installation device and remove 3372/2 thrust pieces.
- Replace 3351/4 bridge with 3351/1 thrust piece and then pull bonded rubber mount in up to stop.

Note:

If the paint on the surface of the subframe is damaged, carry out corrosion protection measures.

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40-91

Lower track control link, removing and installing

Removing

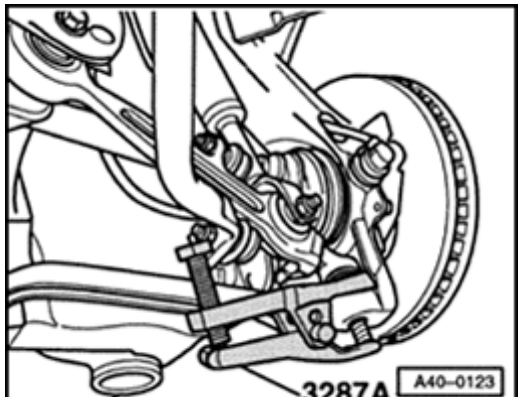
- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap.

- Remove wheel.

Notes:

- *Cover the CV joint boot (e.g. by inserting a piece of leather) to protect it from damage.*
- *For vehicles with headlight range control* ⇒ *page 40-14* .

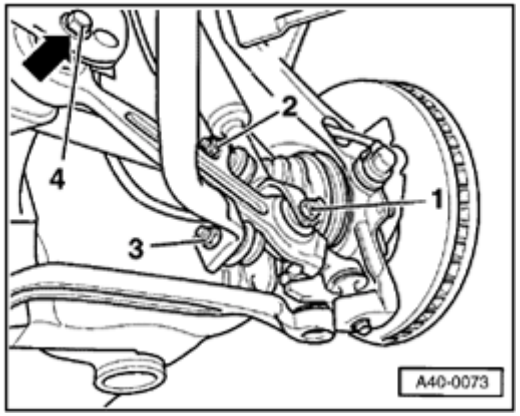


- Remove nut from ball joint of lower track control link, then press ball joint from tapered seat.
  - If necessary counterhold ball joint using 4 mm hex wrench.

Be careful not to damage the boot.

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40-92



- Remove bolt -1-.
- Remove ribbed nuts -2- and -3-, then remove connecting link.

CAUTION!

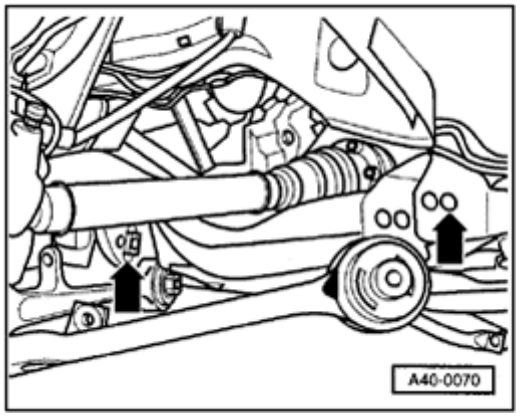
Install a support device (e.g. VAG1383A transmission jack) to prevent damage to the upper link joints resulting from excessive rebound travel in the suspension.

- Remove bolt -4-.
- Remove lower track control link.

Installing

- All nuts and bolts must be replaced

Notes:



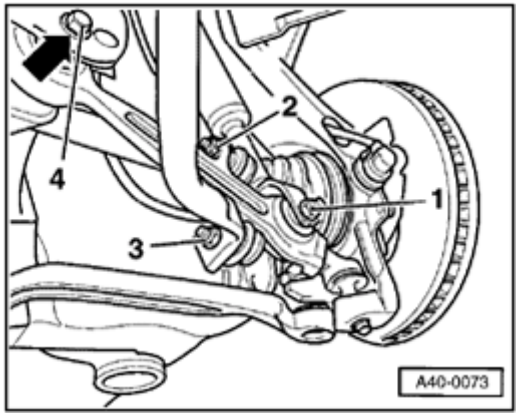
- *Only use inner holes (arrows).*
- *Remove any residue from threads of ball joint.*

CAUTION!

The bonded rubber bushings can only be turned to a limited extent. The bolted connections on the suspension links should therefore only be tightened when the vehicle is standing on the ground.

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40-93



- Install new bolt -4- and new nut.

  Tightening torque: 80 Nm (59 ft lb) + 1/4-turn (90°)

- Tighten nuts at ball joints (lower guide and track control links) to 100 Nm (74 ft lb).
- Tighten nut -1- to 90 Nm (66 ft lb).
- For vehicles with headlight range control, install linkage ⇒ page 40-14 .

Arrow on the connecting link points in the direction of travel.

- Tighten nut -2- to 40 Nm (30 ft lb) + 1/4-turn (90°).
- Tighten nut -3- to 100 Nm (74 ft lb).

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40-94

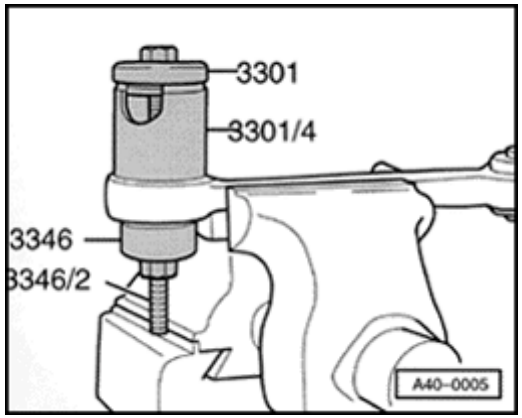
Lower track control link bushings, replacing

Special tools, test equipment and auxiliary items

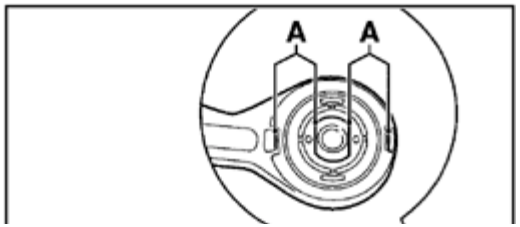
3301	3301/4	3346
3346/2	3346/3	3350/1

Note:

Always use protective jaw covers when clamping an aluminium link in a vise.



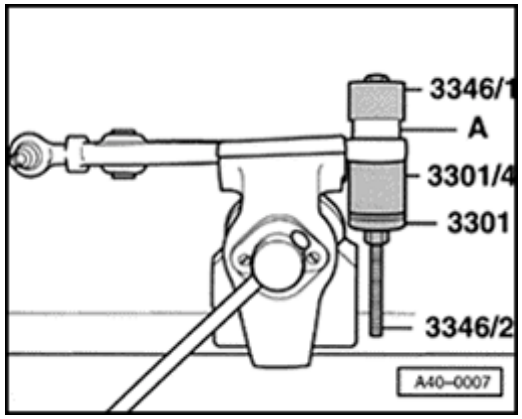
Pulling out inner bushing



Installation position of bushing

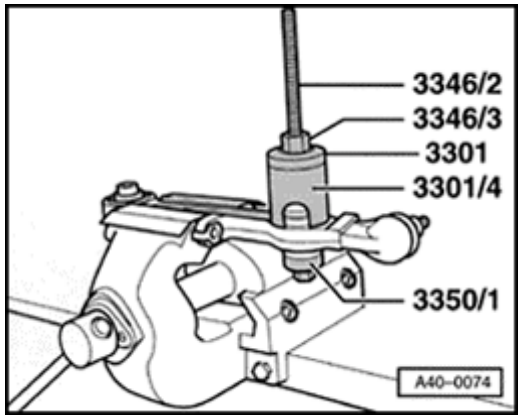
The markings on the lower track control link and on the side of the bushing should be parallel.

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Pulling in inner bushing

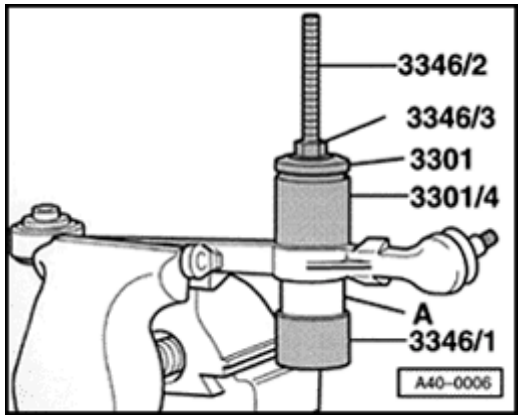
- Insert bushing -A- 3.2 mm (1/8 in.) into recess of 3346/1 thrust piece.
- Pull bushing in up to stop.



Pulling out outer bushing

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40-96



Pulling in outer bushing

- Insert bushing -A- 8 mm (5/16 in.) into recess of 3346/1 thrust piece.
- Pull bushing in up to stop.

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40-97

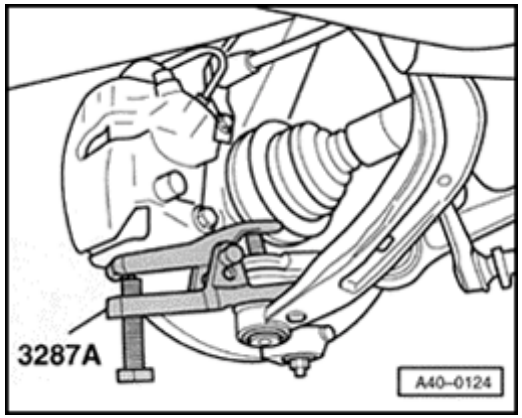
Lower guide link, removing and installing

Removing

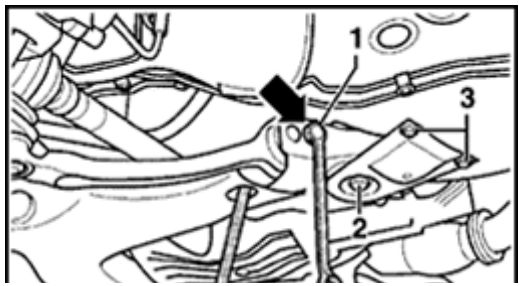
- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap.

- Remove wheel.



- Remove nut from lower guide link ball joint and press off ball joint.
  - If necessary counterhold ball joint using 4 mm hex wrench.



- Loosen bolt -1-.

CAUTION!

Be careful not to damage the undercoating or the surfaces of the brake lines.

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Subframe must be lowered at rear to remove bolt -1-.

- Loosen support plate bolts -3- and subframe bolts -2-.
- Remove guide link.

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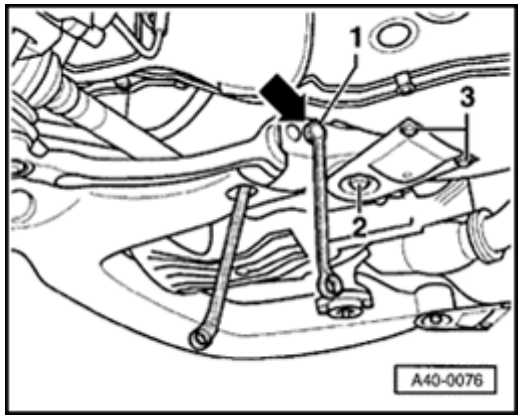
Installing

CAUTION!

The bonded rubber bushings can only be turned to a limited extent. The bolted connections on the suspension links should therefore only be tightened when the vehicle is standing on the ground.

- All nuts and bolts must be replaced

When installing pay particular attention to the following points:



- Tighten nut at ball joint to 100 Nm (74 ft lb).

Notes:

- *Remove any residue from the ball joint threads.*
- *Use only the inner holes (arrow above).*
- *Press the guide link inward when tightening.*

- Install new bolt -1- and new nut.

  Tightening torque: 90 Nm (66 ft lb) + 1/4-turn (90°)

- Tighten bolts -3- ⇒ page 40-10 , Fig. 3:
  - Ribbed bolt tightening torque: 75 Nm (55 ft lb)
  - Non-ribbed bolt tightening torque: 25 Nm (18 ft lb)

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- Install new subframe bolts -2- and tighten to 110 Nm (81 ft lb) + 1/4-turn (90°)

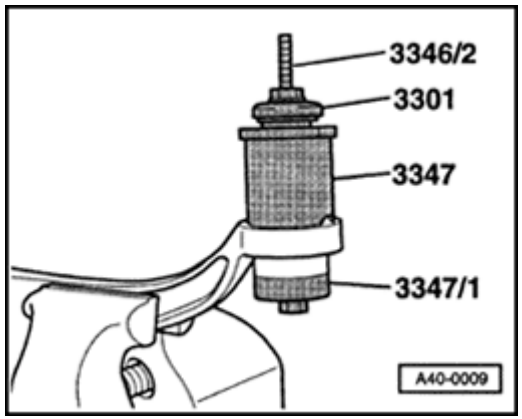
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40-99

Lower guide link hydraulic bushings, replacing

Special tools, test equipment and auxiliary items

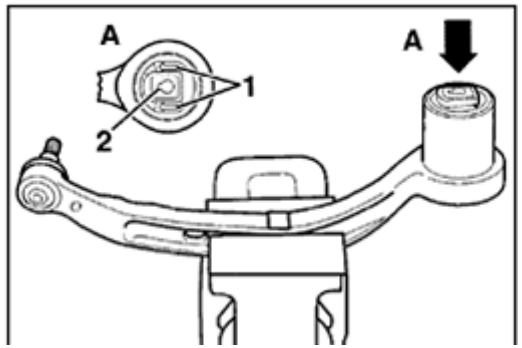
3346/2	3301	3347
3347/1	3346/2	3347/2
3346/3		



Pulling hydraulic bushing out of link

Note:

Always use protective jaw covers when clamping an aluminium link in a vise.



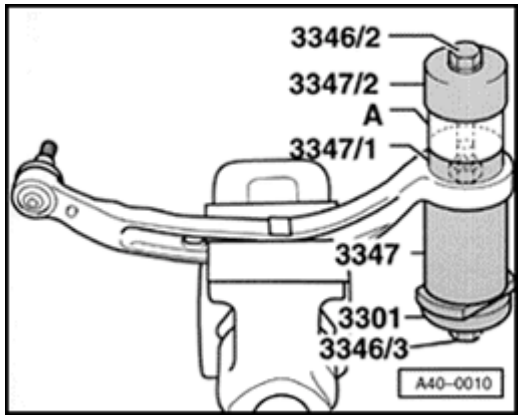
Hydraulic bushing installation position

The arrows on hydraulic bushing -1- and groove -2- point toward the ball joint.

The maximum permissible deviation is ± 5°.

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40-100



Pulling in hydraulic bushing

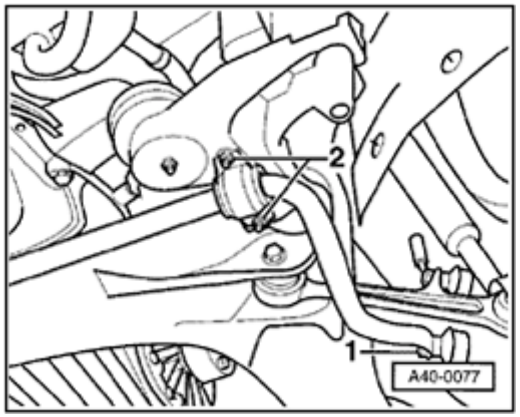
- Insert hydraulic bushing -A- into 3347/2 special tool.
- Tighten 3347/1 sleeve, 3346/2 spindle and nut together.
- Pull hydraulic bushing -A- in up to stop.

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40-101

Stabilizer bar, removing and installing

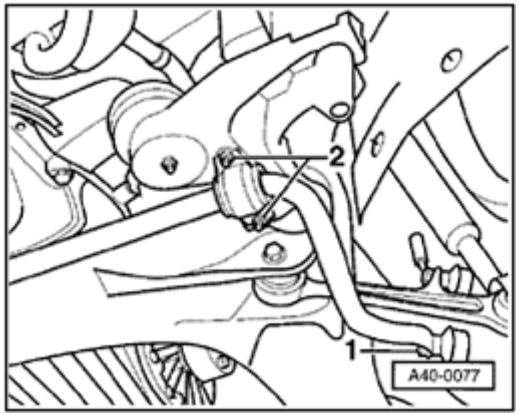
Removing



- Remove noise insulation panel.

- Remove nuts -1-.
- Remove connecting links from stabilizer bar.
- Remove nuts -2-.

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Installing

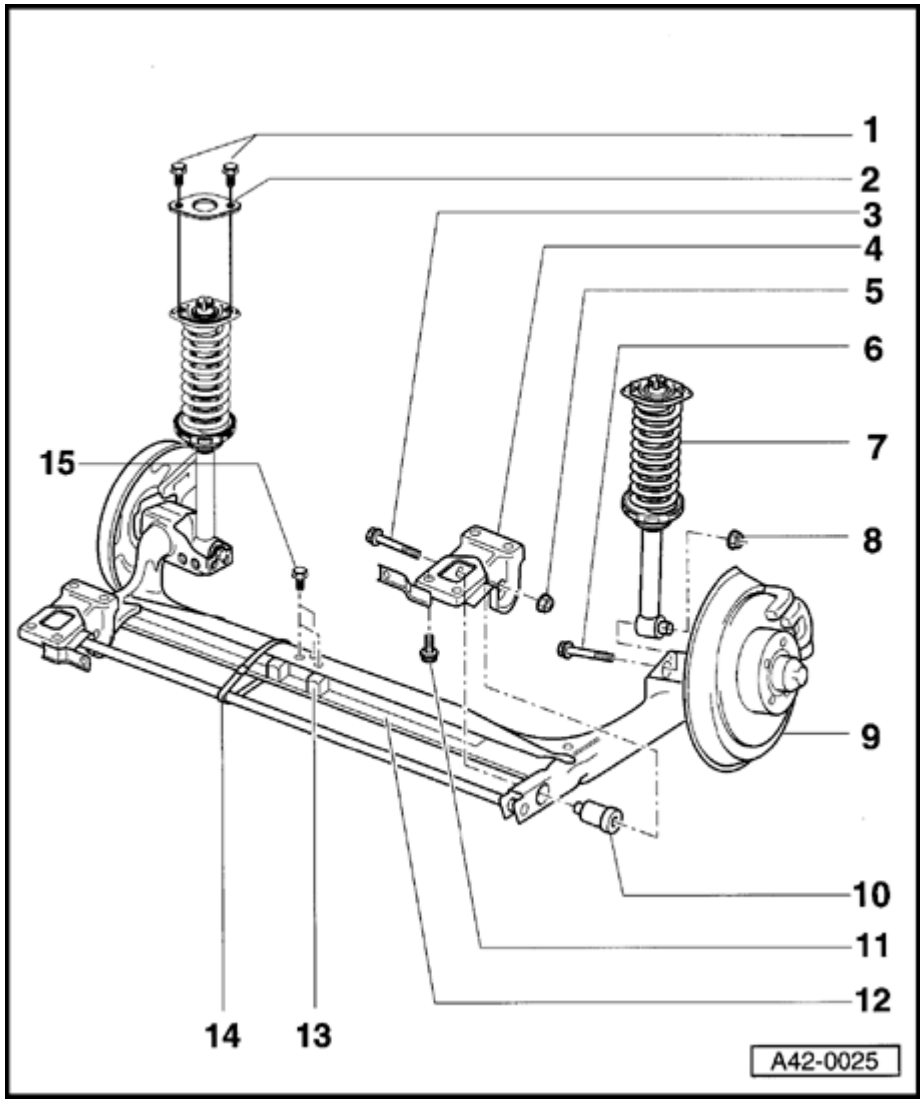
- Install bushings and stabilizer bar.
  - Do not apply grease
  - Arrows on connecting links point in direction of travel
- If replacing stabilizer bar, check which suspension version vehicle is equipped with.

Tightening torques:

- Connecting link to stabilizer bar: 100 Nm (74 ft lb) (always use new ribbed nuts)
- Nuts -2-: 25 Nm (18 ft lb) (always replace)

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42-1



Rear axle, servicing (front-wheel-drive vehicles)

WARNING!

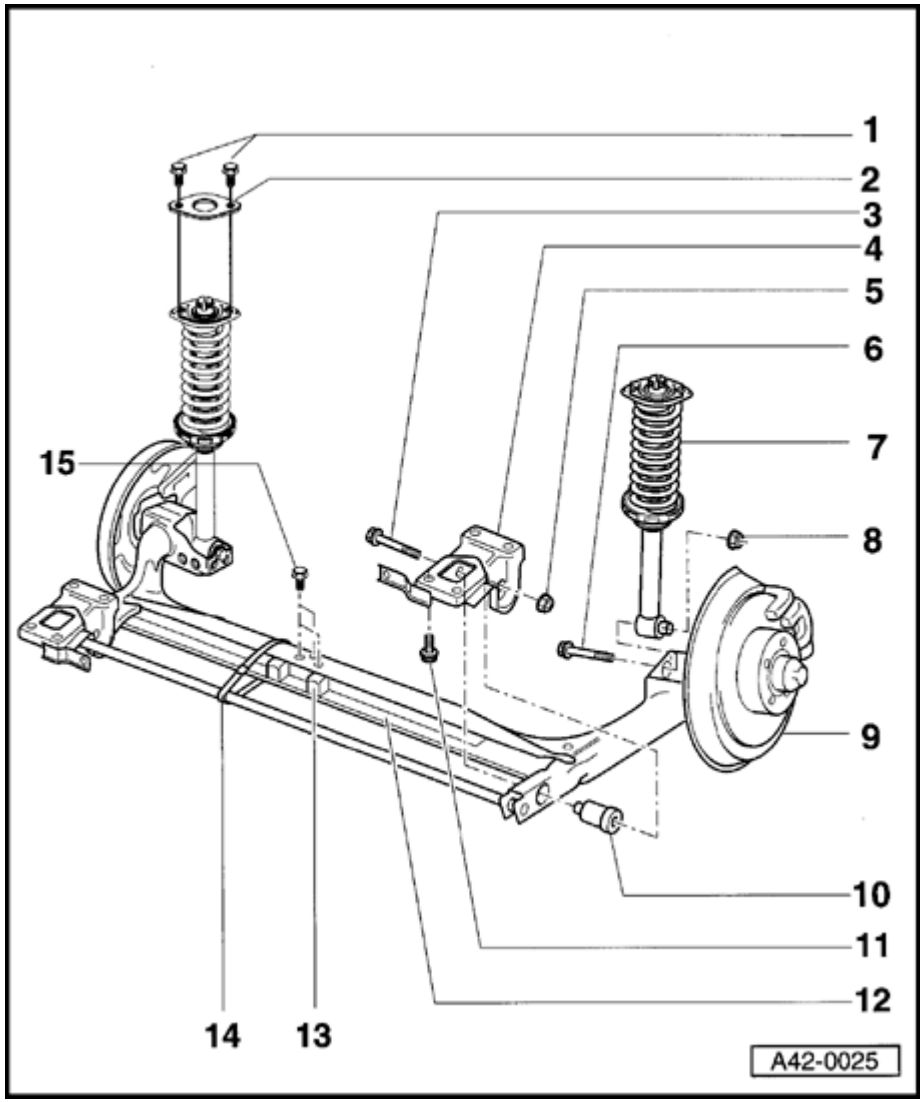
- ***Do not attempt to weld and/or straighten the axle beam.***
- ***Do not re-use fasteners that are worn or deformed in normal use.***
- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

CAUTION!

If using power tools (pneumatic or electric), do not tighten the bolted connections more than hand-tight. Otherwise, the specified tightening torques could be exceeded.

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42-2



1 - Bolts

- 25 Nm (18 ft lb)

2 - Gasket

- Always replace

3 - Bolt

- Always replace

4 - Mounting bracket

- Do not remove in order to remove rear axle
- Be careful when installing bolts

Notes:

- *If mounting bracket - 4 - is removed, carry out a rough alignment of the rear axle after installation ⇒ Fig. 1 .*
- *After all installation work is completed, check and if necessary adjust the wheel alignment ⇒ page 44-13 .*

5 - Nut

- Always replace
- 80 Nm (59 ft lb) + 1/4-turn (90 °)

6 - Bolt

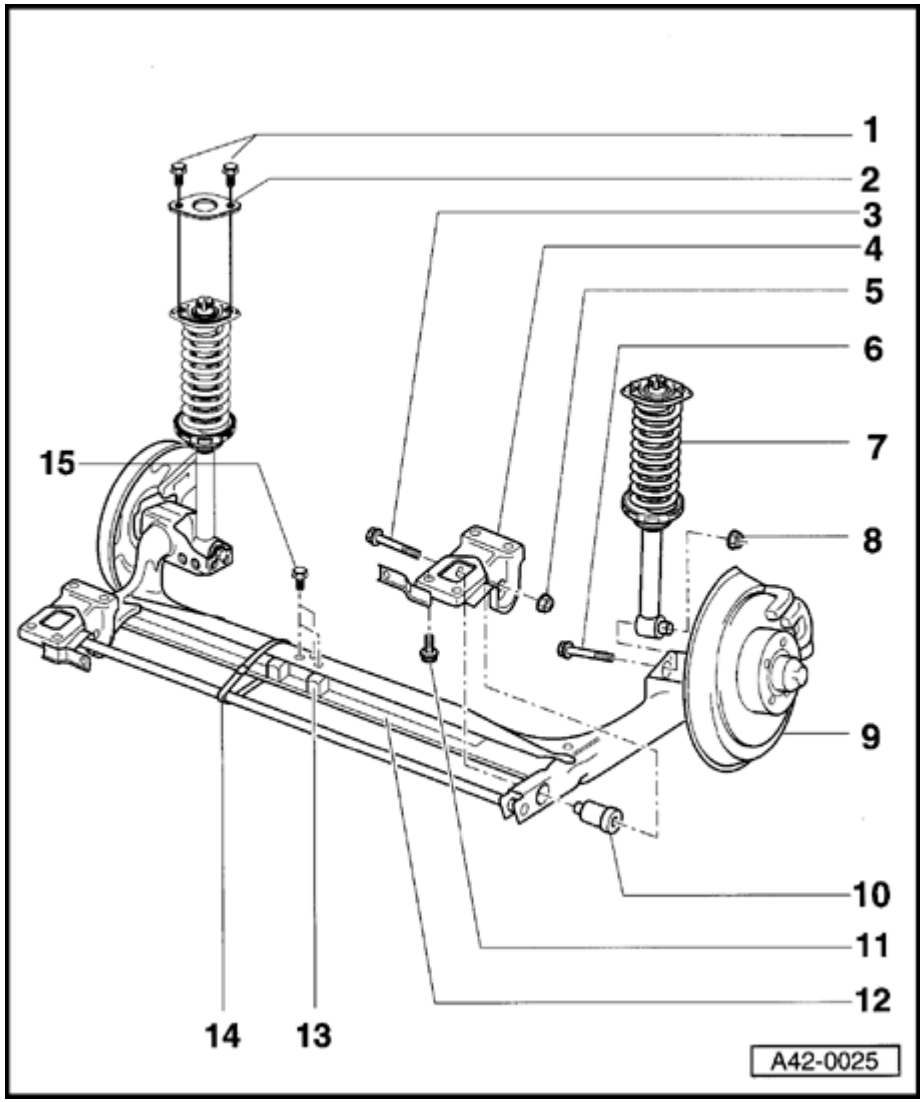
- Always replace

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♦ 50 Nm (37 ft lb) + 1/4-turn (90°)

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42-3



7 - Suspension strut

- Different versions ⇒ vehicle data label, page 42-5
- Do not mix different versions
- Identical part for left and right-sides
- Removing and installing ⇒ page 42-24
- Servicing ⇒ page 42-26

8 - Nut

- Always replace

9 - Wheel bearing and wheel hub

- Servicing ⇒ page 42-16

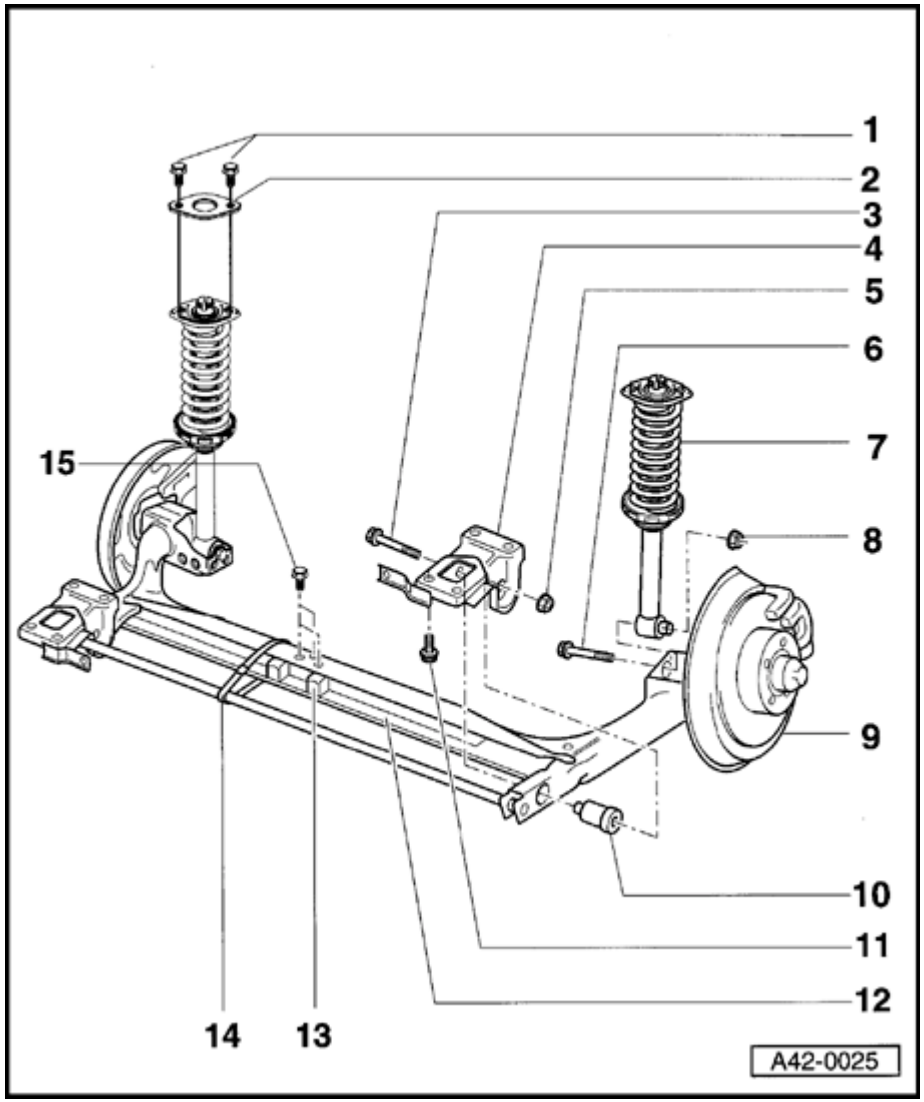
10 - Guide bushing

- Removing and installing ⇒ page 42-14

11 - Bolt

- Always replace
- 75 Nm (55 ft lb)

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12 - Axle beam

- Removing and installing ⇒ page 42-8

  Through m.y. 1998 on vehicles with xenon headlights a headlight range adjuster is installed

- If equipped with headlight range control ⇒ page 42-8
- Refer to Note ⇒ page 42-49
- Contact surfaces for wheel bearing/wheel hub and threaded holes must be free of paint or dirt
- After installing, check and if necessary adjust wheel alignment

13 - Balance weights

Note:

A new guide bushing has been introduced for the A4 Avant and sedan which replaces the old guide bushing and balance weights.

14 - Retaining strap

- Installing ⇒ Figs. 2 and ⇒ 3

15 - Bolt

- 20 Nm (15 ft lb)

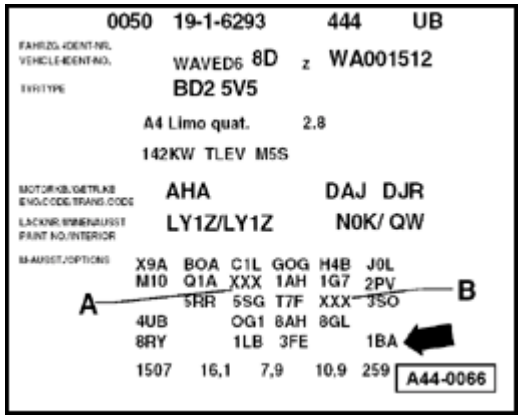
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42-5

Information on weight codes (code number)

From m.y. 1998 ➢, spring/shock assemblies will be classified according to weight codes (code number) so that suspension components can be matched easily.

The spring/shock assembly installed in the vehicle is indicated by the weight code on the vehicle data label.



➢ **Example of vehicle data label**

A - Weight code for front suspension

B - Weight code for rear suspension

The vehicle data label is located in the spare wheel well and in the vehicle Maintenance booklet.

The weight codes can be used to identify the correct spring/shock assemblies on the parts catalog microfiche.

The weight code for the different suspension versions is indicated by the arrow in the illustration.

- 1BA: Standard suspension
- 1BE: Sport suspension
- 1BB: Heavy duty suspension (approx. 20 mm (3/4 in.) higher)
- 1BC: Special purpose suspension

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- 1BD: Sport suspension, Audi S4
- 1BH: USA

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- 1BT: Heavy duty suspension (approx. 7 mm or 1/4 in. higher)

- 1BP: Heavy duty suspension (same ride height as 1BA but with limited bump)

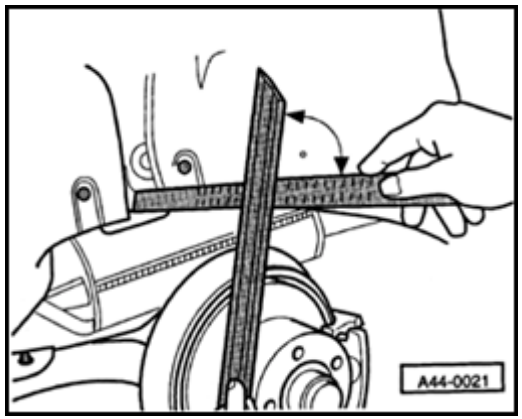


Fig. 1 Rough alignment of rear axle

- With mounting bolts loosened, push rear axle fully forward (direction of travel) and then center it from side-to-side using two rulers.

Checking wheel alignment ⇒ page 44-6 .

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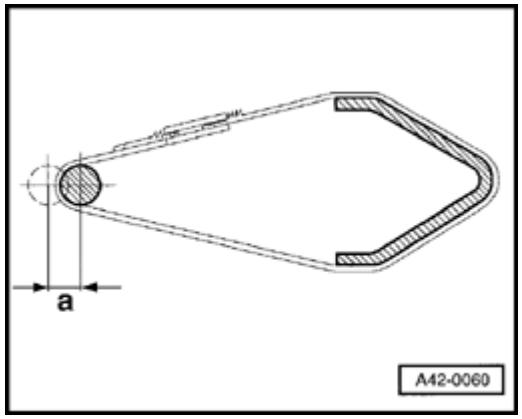


Fig. 2 Installing retaining strap

- Press center of stabilizer bar toward axle beam.

  Dimension -a-: approx. 8 mm (5/16 in.)

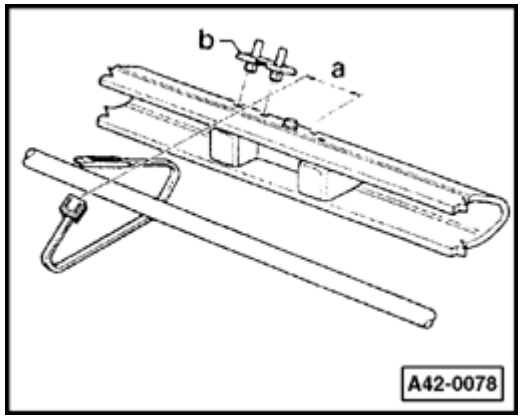


Fig. 3 Installing retaining strap (continued)

- Press stabilizer bar 8 mm (5/16 in.) toward axle beam, then install retaining strap off-set to right.

  Dimension -a-: 100 mm (3.94 in.)

- Make sure retaining strap contacts both axle beam and stabilizer bar then fasten strap (lock facing upward).

Note:

If the axle beam is supplied with pre-drilled holes for mounting retaining strap guide -b-, the guide must be used. Guide -b- correctly positions the retaining strap and dimension -a- can then be ignored.

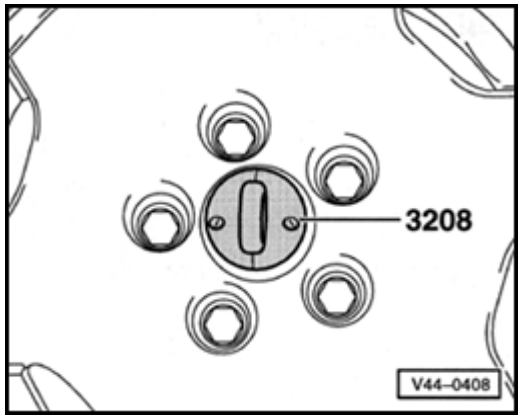
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42-8

Rear axle, removing and installing

Removing

- Vehicle must be standing on its wheels above vehicle lift



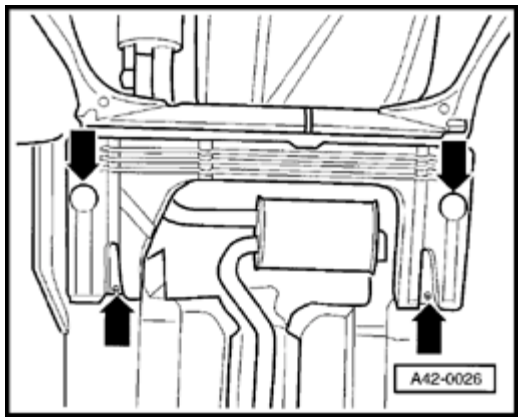
- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap

- Raise vehicle.
- Extract brake fluid from reservoir:

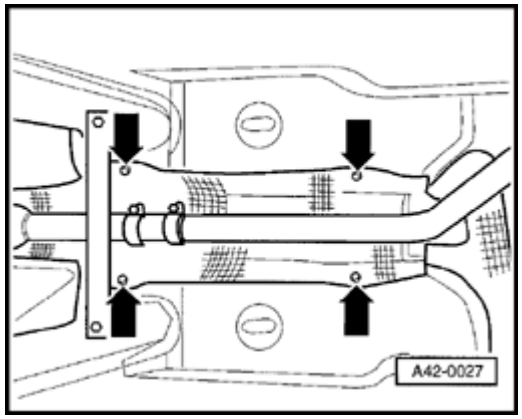
⇒ *Repair Manual, Brake System, Repair Group 47*

- Remove wheels.

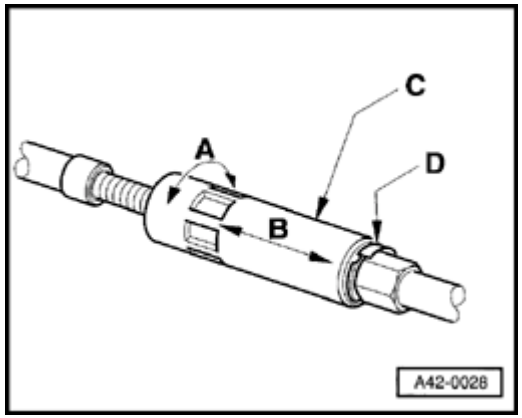


- Remove cover (arrows).

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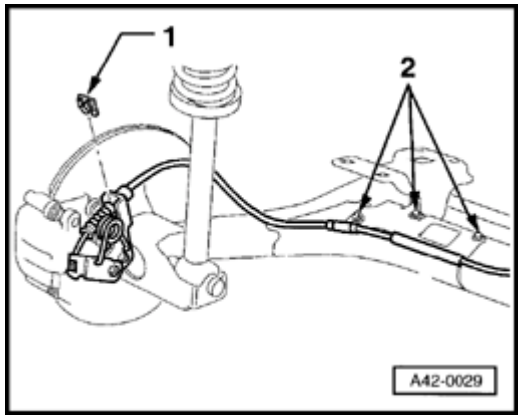
- Unbolt heat shield cover (arrows indicate bolted connections) and push forward until parking brake cable adjuster becomes accessible.



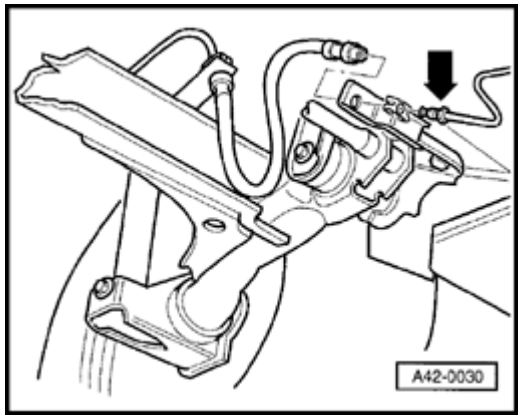
- Loosen both cable adjusters as follows:
  - Remove locking clip -D-.
  - Screw in adjusting nut -C- up to stop.
  - Push adjuster together.

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42-10



- Remove locking plates -1- on left and right-sides, slightly loosen bolts -2- for cable retaining plate, and remove cables from axle beam.



- Disconnect brake lines at rear axle (arrow) on both sides.

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42-11

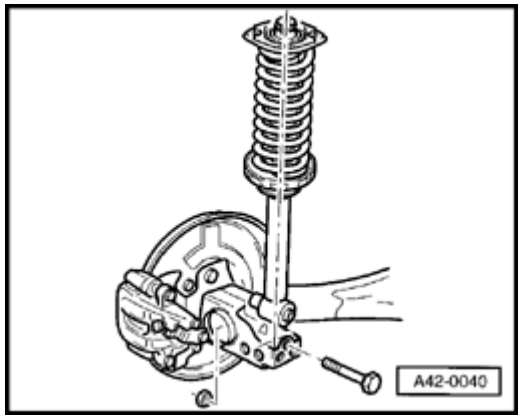
- Pull ABS wheel speed sensors out of mounting holes on both sides.

- Detach ABS wheel speed sensor wiring from rear axle.

- On vehicles with headlight range control remove linkage from axle beam.

Note:

Use VAG1383 gearbox lifter together with 1359/2 attachment for removing and installing the axle beam.



- Unbolt and remove suspension strut from axle beam.
- Remove bolts from guide bushings (⇒ page 42-2 , items -3- and -5-) and remove axle beam.

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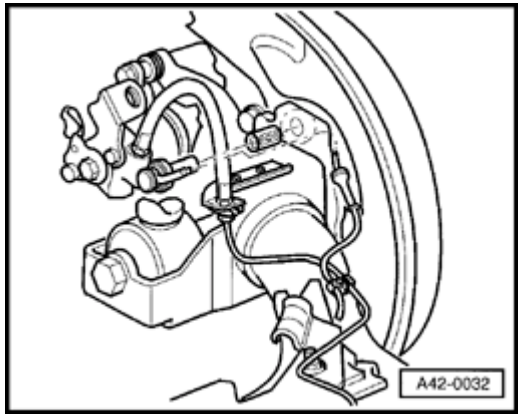
42-12

Installing

- Install axle together with guide bushings into mounting brackets and install bolts hand-tight.

- Install suspension struts and hand-tighten suspension strut to axle beam bolts.

- Coat O-ring for ABS wheel speed sensor with brake cylinder paste.



- Push ABS wheel speed sensors into wheel bearing housings up to stop.
- Install locking plates for ABS wheel speed sensors.
- Route parking brake cables and attach to brake calipers.
- Connect brake lines.
- Adjust parking brake:

⇒ *Repair Manual, Brake System, Repair Group 46*

- Install heat shield.
- Bleed brakes:

⇒ *Repair Manual, Brake System, Repair Group 47*

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CAUTION!

Vehicle must be standing on its wheels when tightening guide bushing to rear axle bolts. Otherwise bonded rubber bushings will be subjected to torsion resulting in shortened service life

- Tighten guide bushing bolts (⇒ page 42-2 , items -3- and -5-).

  Tightening torque: 80 Nm (59 ft lb) + 1/4-turn (90 °)

CAUTION!

Vehicle must be standing on its wheels when tightening suspension strut to rear axle bolts. Otherwise bonded rubber bushings will be subjected to torsion resulting in shortened service life

- Tighten suspension strut to axle beam bolts (⇒ page 42-2 , items -6- and -8-).

  Tightening torque: 50 Nm (37 ft lb) + 1/4-turn (90 °)

- On vehicles with headlight range control, tighten bolted connection between headlight range

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control linkage to axle beam.

Tightening torque: 3 Nm +1/-0 Nm (27 in. lb +9/-0 in. lb)

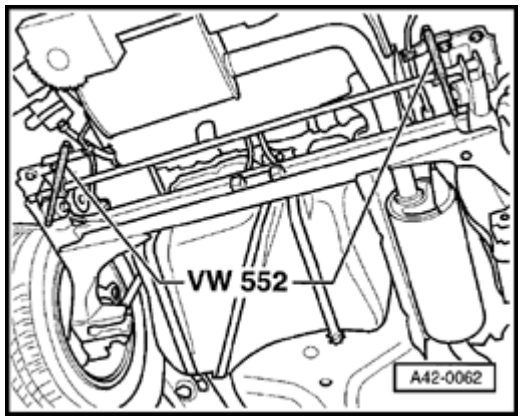
- Install cover below rear axle.

- Check wheel alignment and adjust if necessary ⇒ page 44-6 .

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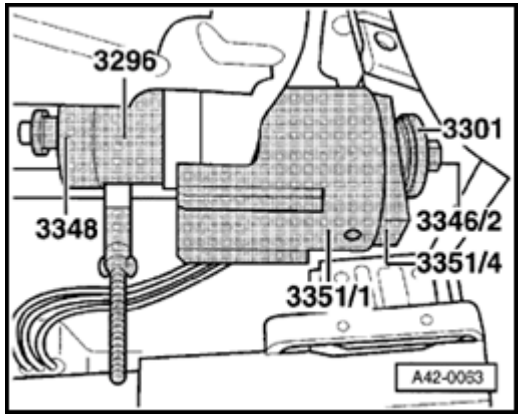
42-14

Guide bushings, removing and installing



Lowering rear axle

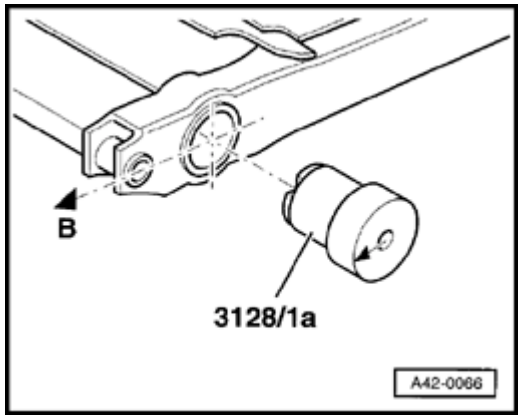
- On vehicles with headlight range control remove linkage from axle beam.
- Remove bolts from guide bushing mount and lower axle.
- Position VW552 guide piece to prevent brake lines from becoming stressed.



Removing guide bushing

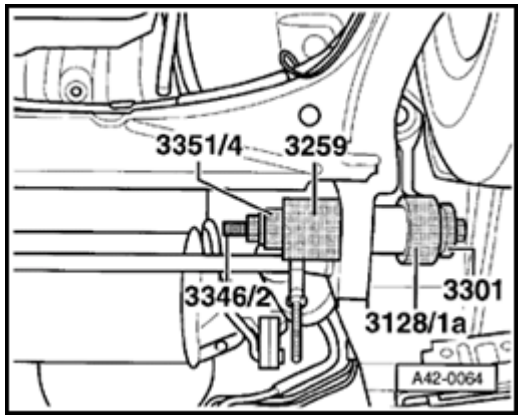
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42-15



Guide bushing installation position

The guide bushing must be pulled into the rear axle with the arrow on the 3128/1a installation piece pointing in direction -B-.



Pulling in guide bushing

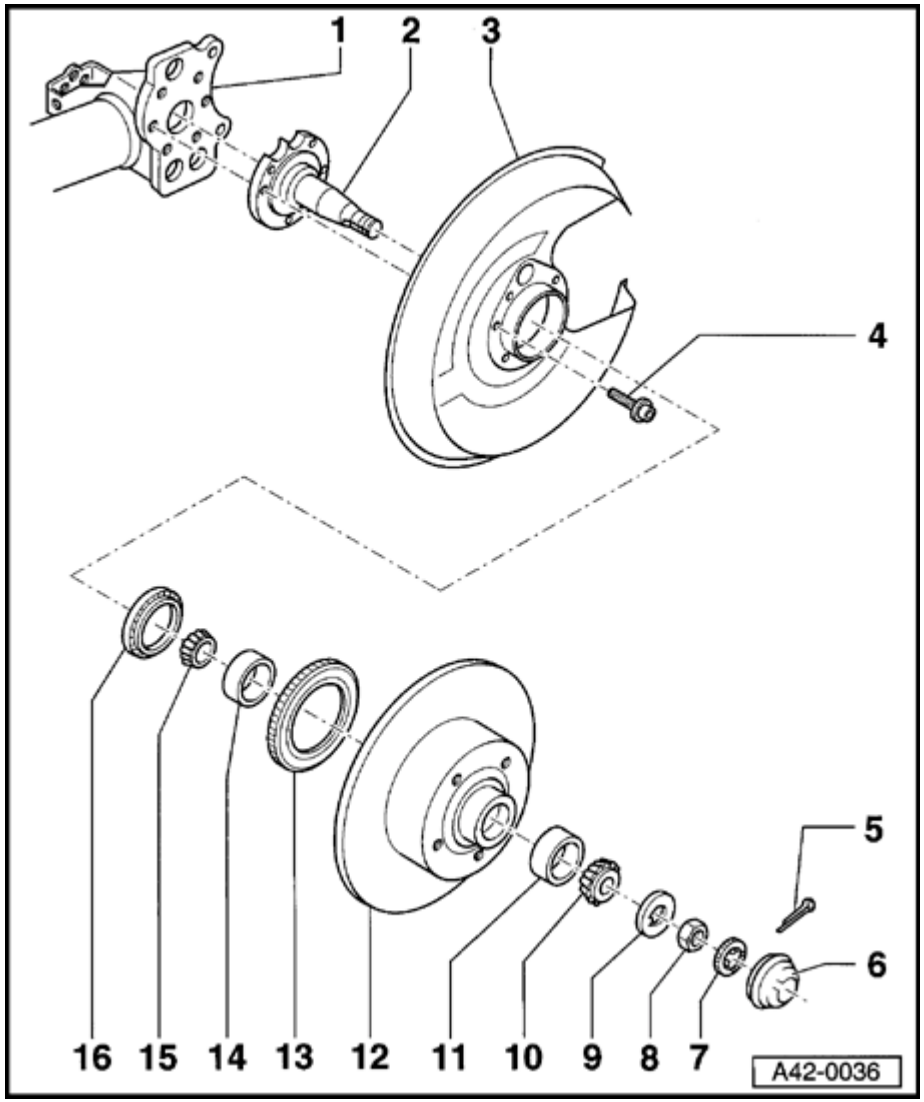
The remainder of the installation is the reverse of removal.

CAUTION!

Vehicle must be standing on its wheels when tightening guide bushing to rear axle bolts. Otherwise bonded rubber bushings will be subjected to torsion resulting in shortened service life

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42-16



Rear wheel bearing and wheel hub, servicing

Before carrying out work on the wheel bearings or wheel hub the wheel and brake caliper must be removed:

⇒ *Repair Manual, Brake System, Repair Group 46*

CAUTION!

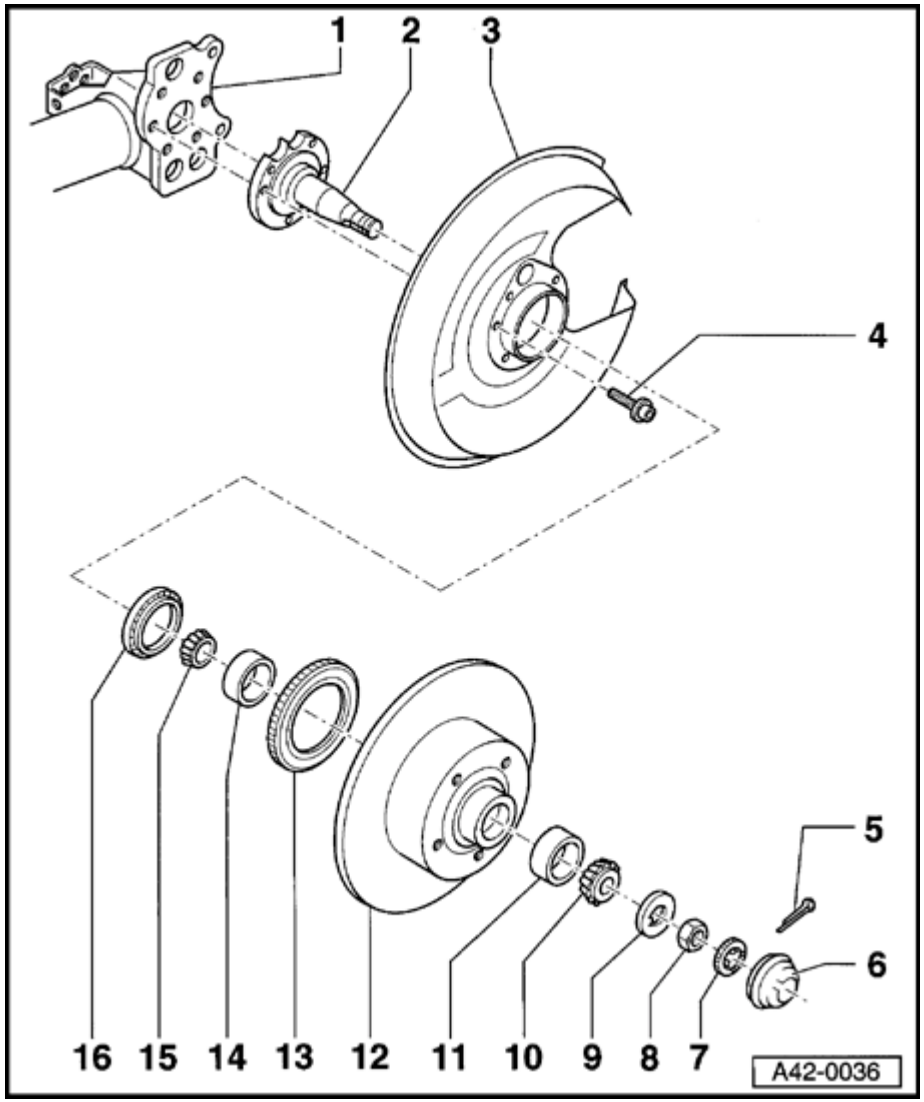
- ***Suspend the brake caliper using a piece of wire.***
- ***Do not allow the caliper to hang by the brake hose. The unsupported weight can stretch and damage the brake hose.***
- ***Do not attempt to weld or straighten the load bearing components or parts of the suspension***

Notes:

- *Only re-install clean bearings; do not wash out bearings.*
- *Make sure wheel bearing clearance is set carefully.*

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42-17



1 - Axle beam

- Contact surface for stub axle must be free of dirt

2 - Stub axle

- Different versions ⇒ parts catalog microfiche

3 - Splash shield

4 - Combi-bolt

- 30 Nm (22 ft lb)

5 - Cotter pin

- Always replace

6 - Grease cap

- Always replace
- Forcing off ⇒ Fig. 1
- Driving in ⇒ Fig. 2

7 - Slotted ring

- Install over nut - 8 -

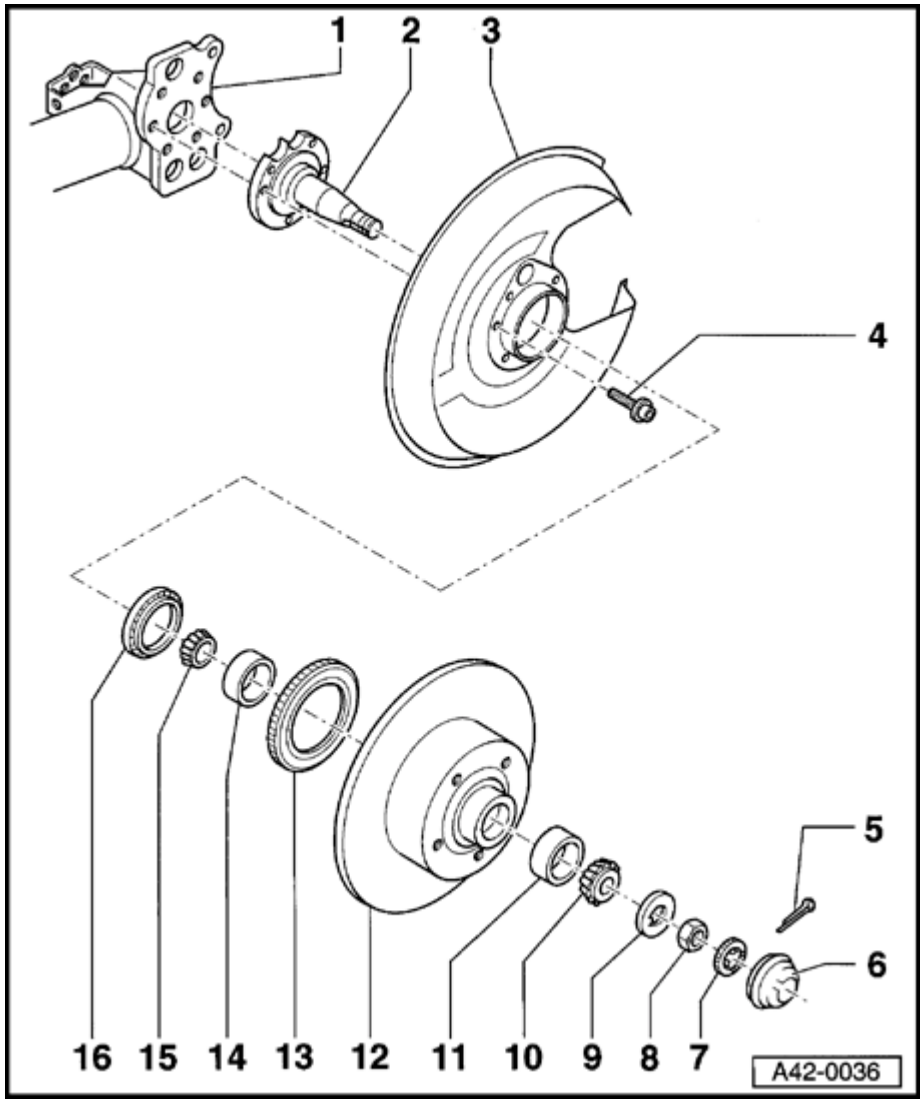
8 - Nut

- Setting wheel bearing clearance ⇒ Fig. 3

9 - Thrust washer

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42-18



10 - Outer wheel bearing

- Do not wash out if bearing is to be re-used

11 - Outer wheel bearing outer race

- Use copper arbor to drive out
- Pressing in ⇒ Fig. 4
- Apply small quantity of wheel bearing grease to wheel bearing seat before pressing in bearing race

12 - Brake disc with wheel hub

13 - ABS wheel speed sensor rotor

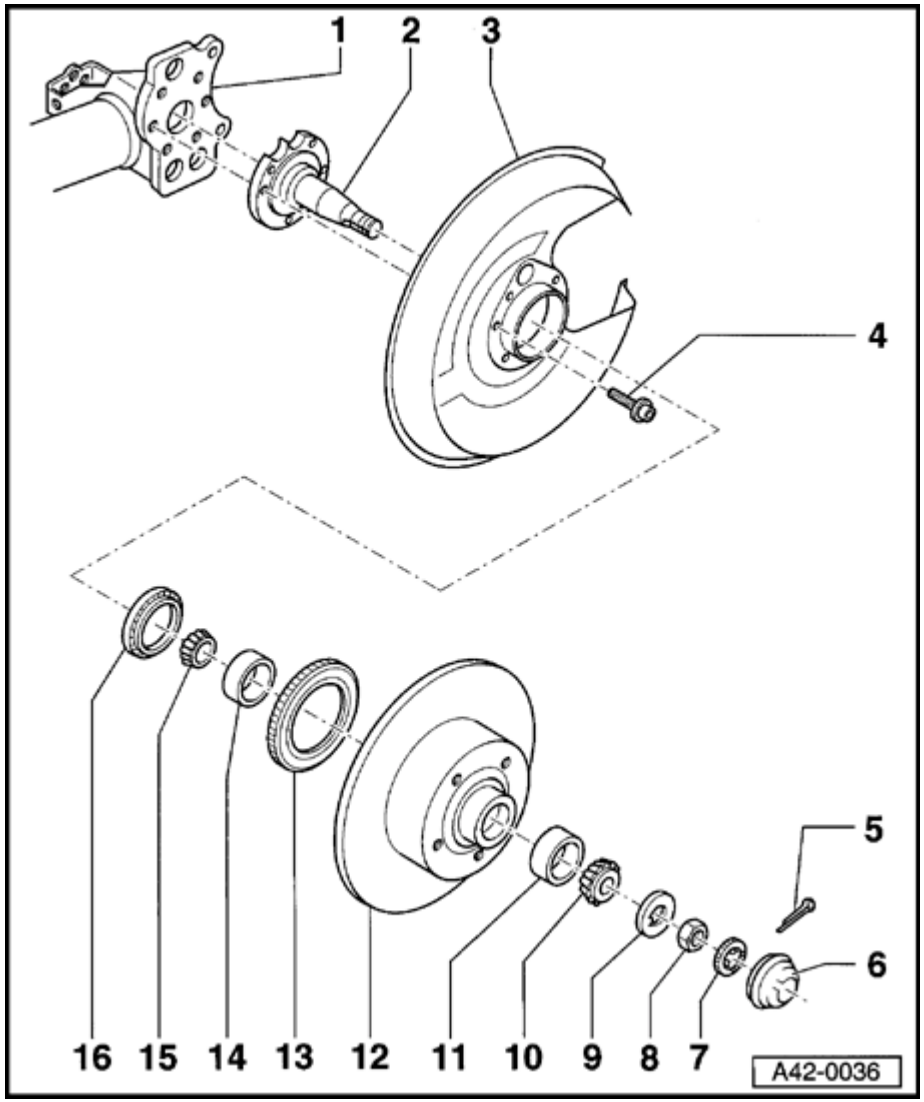
- Drive off evenly using copper arbor through tapped holes in wheel hub
- Pressing in ⇒ Fig. 5

14 - Inner wheel bearing outer race

- Use copper arbor to drive out outer race
- Apply small quantity of wheel bearing grease to wheel bearing seat before pressing in bearing race

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42-19



15 - Inner wheel bearing

- Do not wash out if bearing is to be re-used

16 - Seal

- Always replace
- Different versions ⇒ parts catalog microfiche
- Fill area between sealing lips with multi-purpose grease ⇒ Fig. 7

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42-20

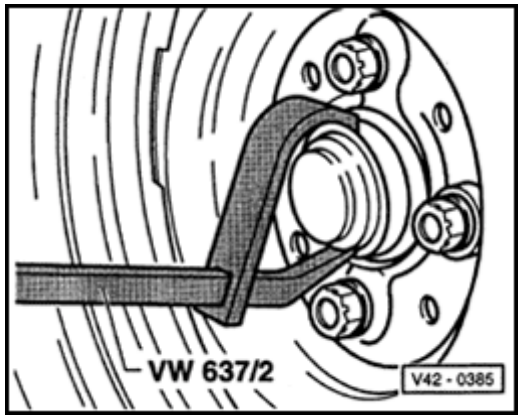


Fig. 1 Removing grease cap

- Remove grease cap from seat by tapping gently on claw of tool.

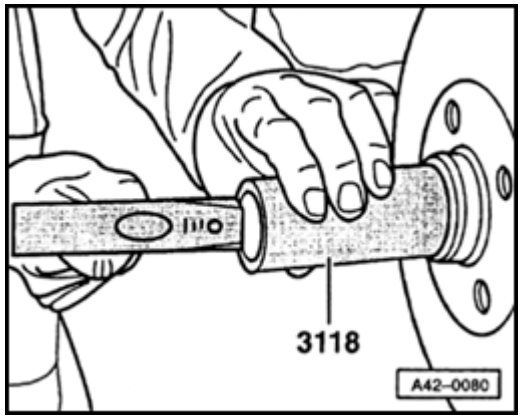


Fig. 2 Driving on grease cap

Notes:

- *Damaged (dented/buckled) grease caps permit the penetration of moisture and must always be replaced.*
- *When installing a grease cap always use the tool shown to prevent damage.*

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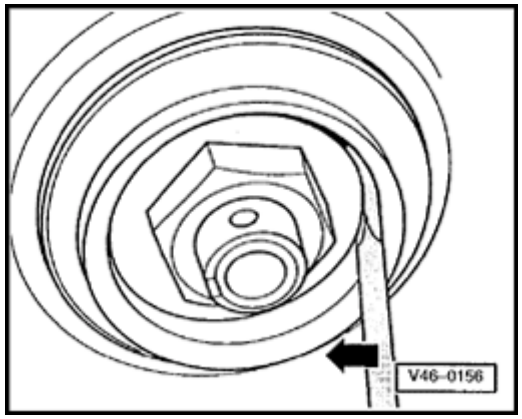


Fig. 3 Setting wheel bearing clearance

Note:

Wheel bearing play is correct when the thrust washer can just be moved using a screwdriver simply by applying pressure, without having to apply force.

- Secure with slotted ring and new cotter pin.

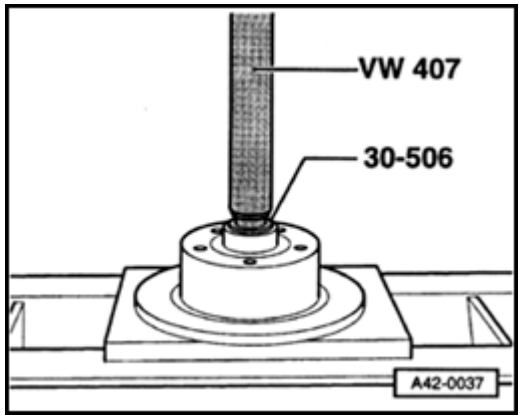


Fig. 4 Pressing in outer race for outer wheel bearing

- Apply small quantity of wheel bearing grease to wheel bearing seat before pressing in bearing race.

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42-22

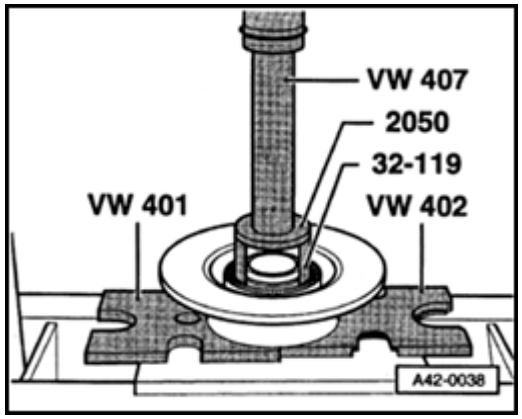


Fig. 5 Pressing in ABS wheel speed sensor rotor

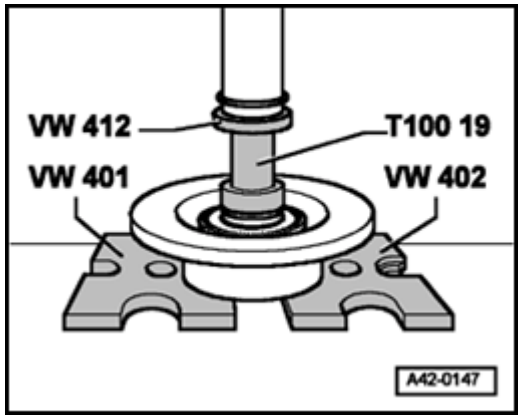


Fig. 6 Pressing in outer race for inner wheel bearing

- Apply small quantity of wheel bearing grease to wheel bearing seat before pressing in bearing race.

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42-23

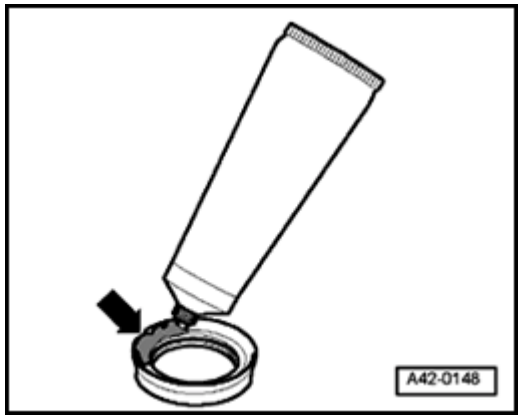


Fig. 7 Fill groove (arrow) with grease

From m.y. 1998 ➢, revised stub axles and dust lips will be installed ⇒parts catalog microfiche.

Note:

For greater clarity, the seal is shown removed.

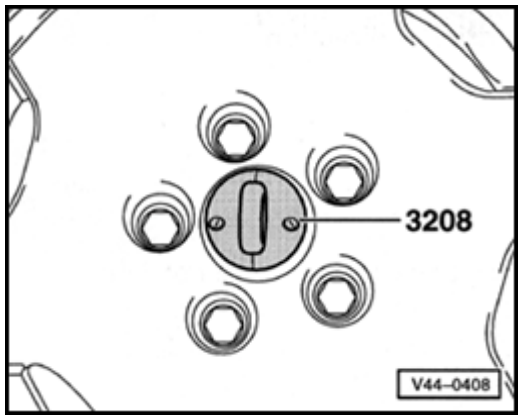
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42-24

Suspension strut, removing and installing

Removing

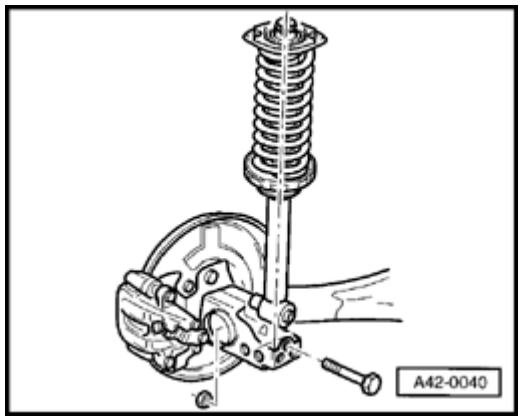
- Vehicle must be standing on its wheels above vehicle lift



- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap

- Raise vehicle.
- Remove wheel.



- Unbolt suspension strut from axle beam ⇒ page 42-2 , items -6- and -8-.
- Remove rear seat backrest side bolster cover or backrest:

⇒ *Repair Manual, Body Interior, Repair Group 72*

- Unbolt upper suspension strut mount ⇒ page 42-2 .

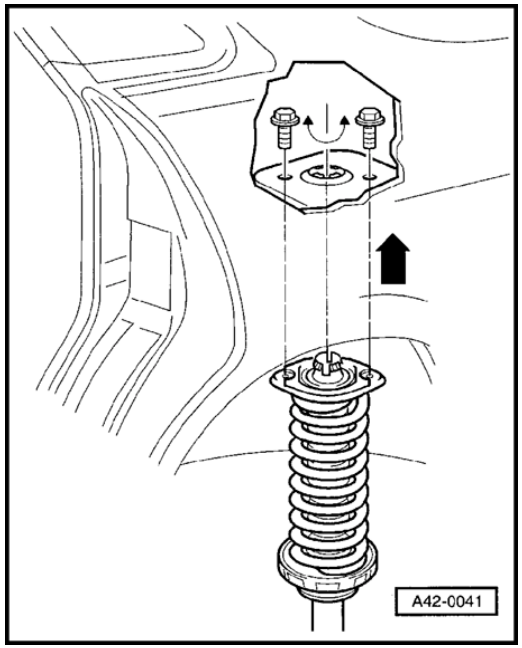
Note:

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In addition to the bolted connection, the suspension strut is also attached to the body by four retaining lugs.

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42-25



- Turn suspension strut until retaining lugs are positioned above recesses.
- Pull suspension strut downward out of its mount.

Installing

- Install in reverse order of removal.
- Replace gasket on upper spring plate. Thoroughly clean all sealing surfaces

Note:

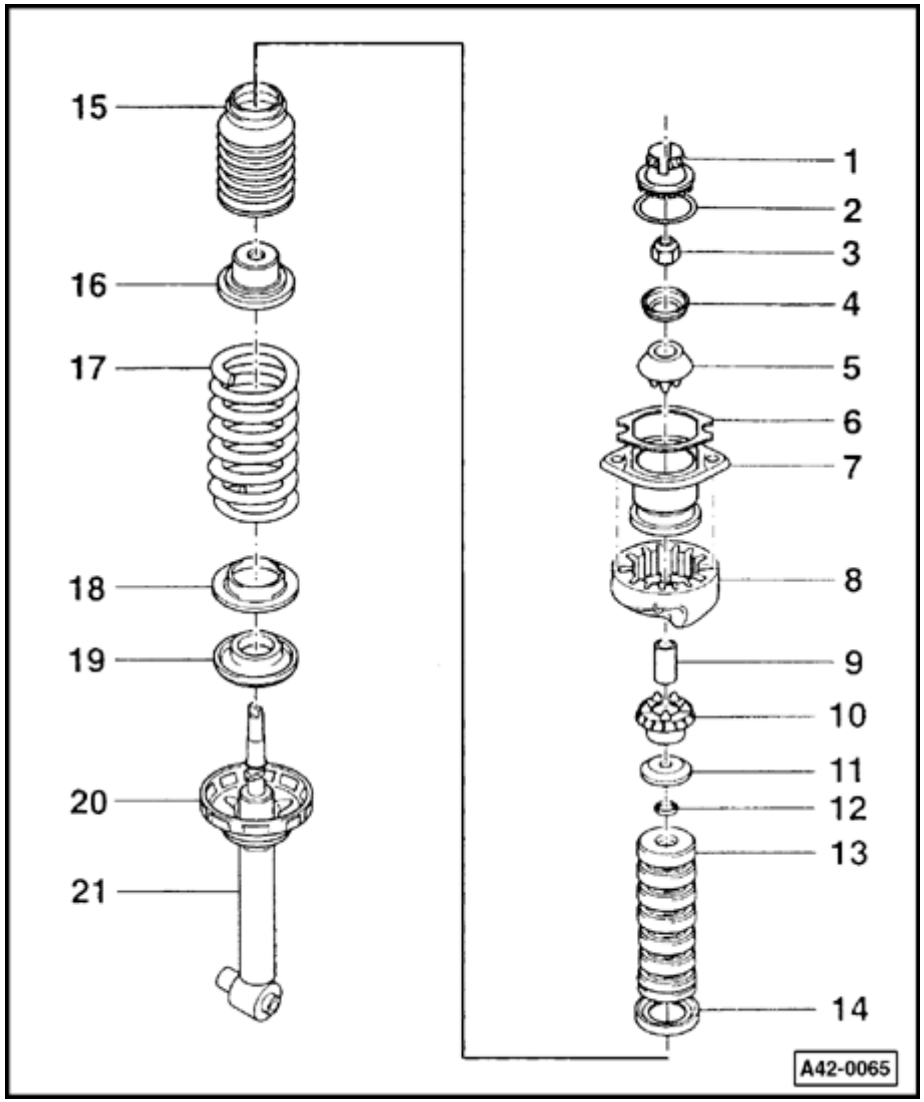
When installing, make sure that the retaining lugs engage properly.

CAUTION!

The bonded rubber bushings can only be turned to a limited extent. The bolted connections between the shock absorbers and the rear axle should therefore only be tightened when the vehicle is standing on the ground. Otherwise the bonded rubber bushings will be subjected to a torsional stress resulting in shortened service life

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42-26



Suspension strut, servicing

Component locations

1 - Cap

2 - O-ring

- Coat with silicone grease, Part No. G 000 405 A2

CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

3 - Self-locking nut

- Always replace
- 25 Nm (18 ft lb)

4 - Dished washer

5 - Mounting ring

- Make sure installation position is correct when installing

6 - Gasket (foam)

- Always replace

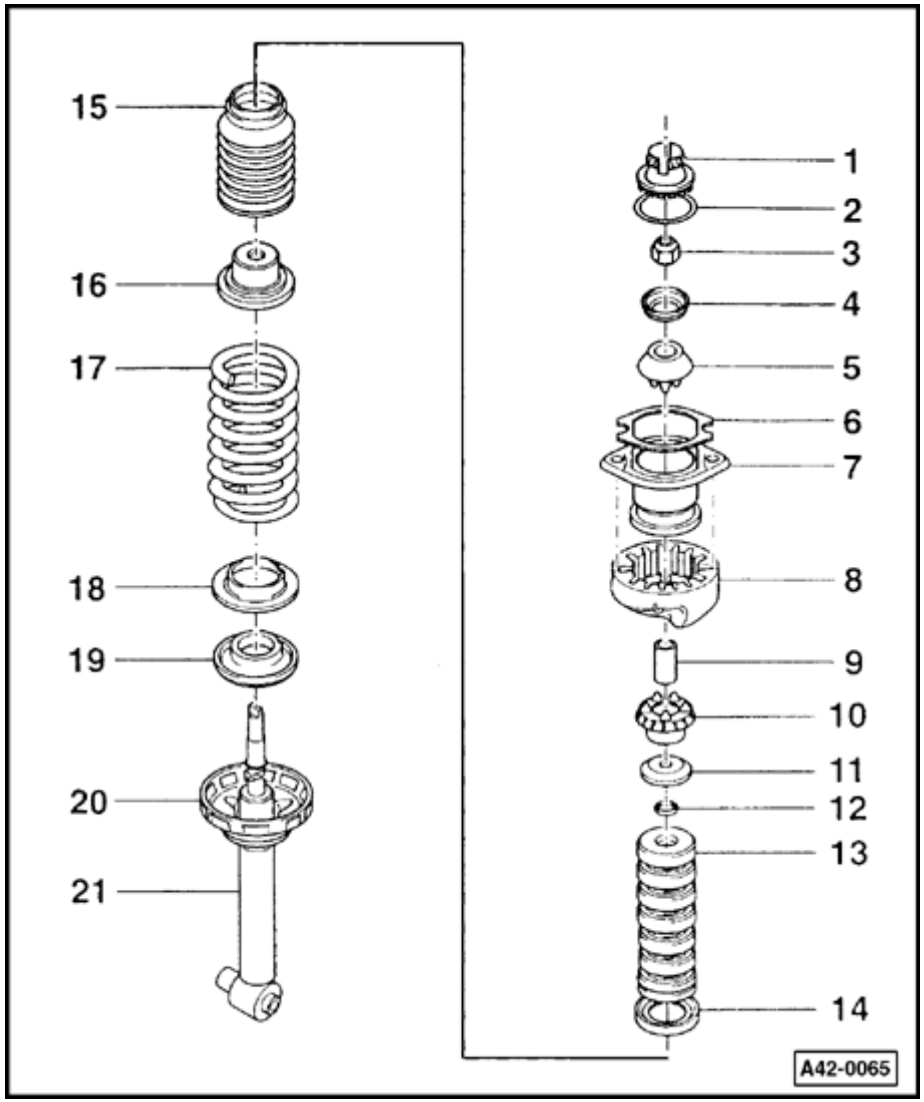
7 - Upper spring retainer

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8 - Upper spring mount

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42-27



9 - Spacer tube

10 - Mounting ring

- Make sure installation position is correct when installing

11 - Lower washer or cup

- Suspension versions 1BA, 1BP and 1BE have lower washer
- Suspension version 1BB has cup

12 - Ring

- Suspension version 1BB has different version

13 - Auxiliary spring

14 - Boot mounting ring

15 - Boot

16 - Protective cap

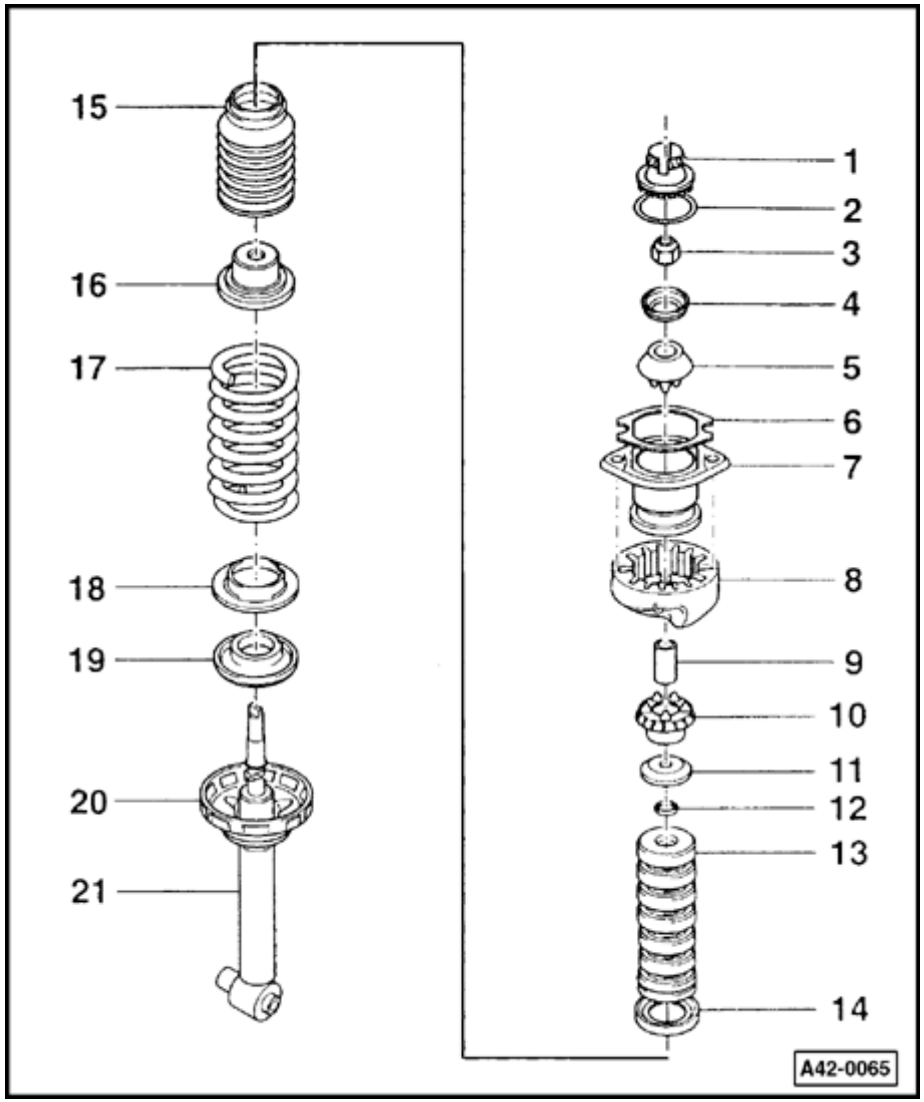
- Suspension version 1BB has different version

17 - Spring

- Different versions depending on suspension version ⇒ vehicle data label, page 42-5
- Always replace springs in pairs
- Install with color marking at bottom

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42-28



18 - Spring retainer

19 - Lower spring base

20 - Lower spring seat

CAUTION!

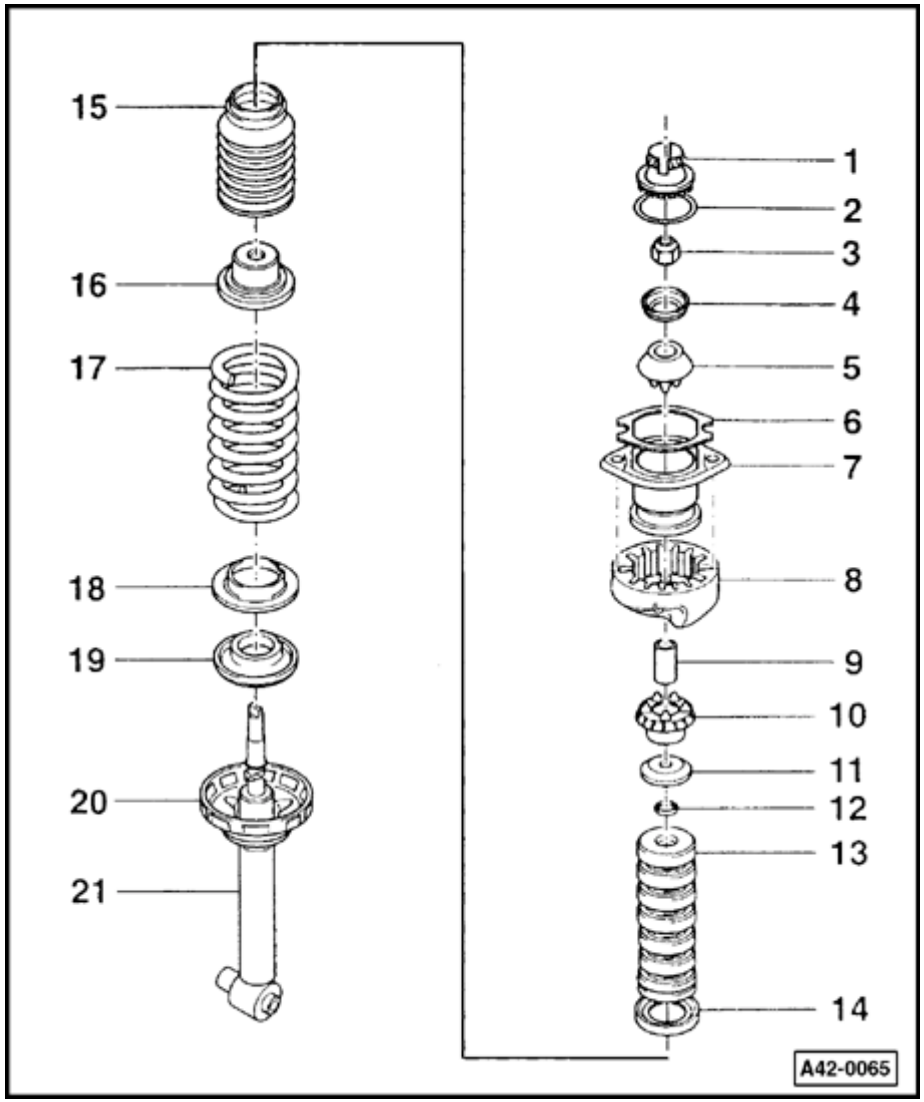
Do not damage the surface of the spring when driving on the lower spring base - 19 - and the spring retainer - 18 - during assembly.

21 - Gas shock absorber

- Different versions ⇒ parts catalog microfiche
- Can be replaced individually
- Supplied as replacement part with lower spring retainer pressed on
- Different versions depending on suspension version ⇒ vehicle data label, page 42-5
- Malfunctioning shock absorbers must be disposed of properly

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42-29



Checking:

- Compress shock absorber by hand. Do not press piston rod with excessive force against end stop otherwise valves could be damaged.

- Piston rod must move evenly and smoothly over entire stroke

- Release piston rod.

- Piston rod returns automatically back to starting position if gas charge is adequate

- Visually inspect shock absorber mount for settling and position of circlip on shock absorber piston rod should be checked ⇒ Special Information binder

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42-30

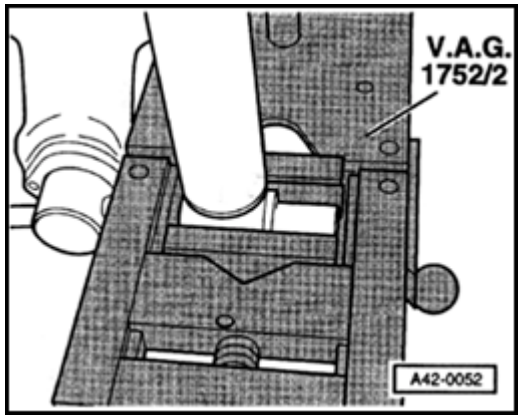
Disassembling and assembling suspension strut

Note:

Pay attention to the different components used in the various suspension versions (e.g. "Standard", "Sport" and "Heavy Duty" suspensions).

Disassembling

- Clamp VAG1752/2 spring mounting tool in vise.



- Install shock absorber into VAG1752/2 spring mounting tool.
- Use screwdriver to pry out cap ⇒ page 42-26 , item -1-.



- Place VAG1752/1 spring compressor onto coil spring.

WARNING!

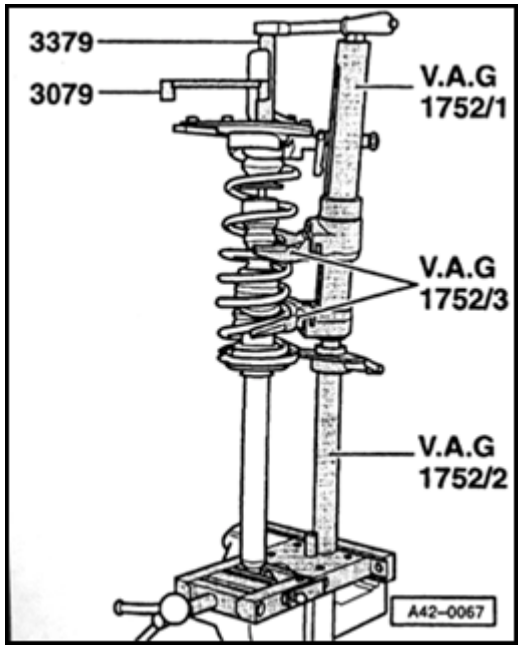
Make sure the coil spring is seated correctly in the VAG1752/3

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adapter (arrow).

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42-31

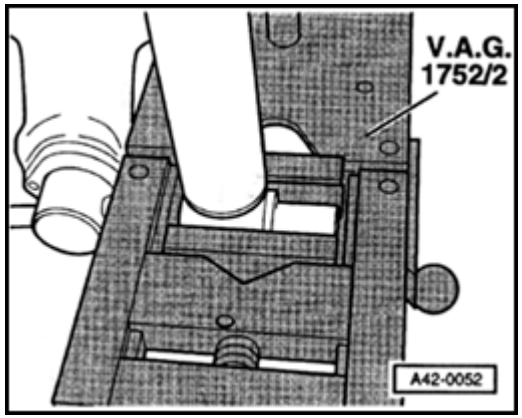


- Compress coil spring using VAG1752/1 spring compressor until upper spring retainer is free.
- Remove self-locking nut from piston rod (counter hold using hex wrench).
- Remove appropriate components.

Assembling

Note:

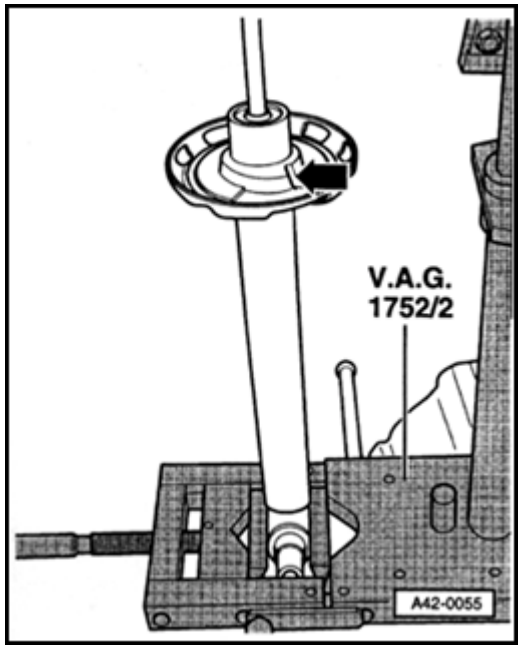
The left and right-side suspension struts are identical parts.



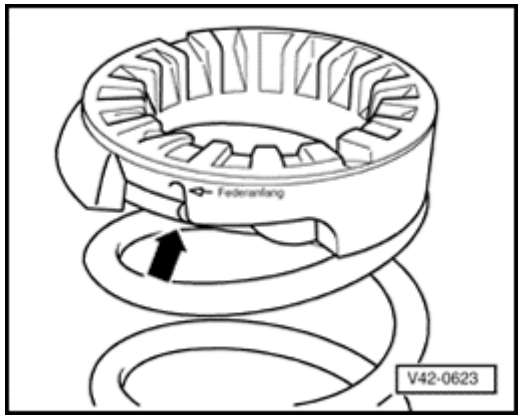
Clamp shock absorber in VAG1752/2 spring mounting tool.

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42-32



- Align lower spring base and spring retainer in direction of shock absorber eye, as illustrated.
- Install compressed coil spring.
  - End of spring coil must lie against stop on spring retainer (arrow).
- Install protective cap, boot, boot mounting ring, auxiliary spring, ring, mounting ring and spacer tube.
- Install upper spring base.

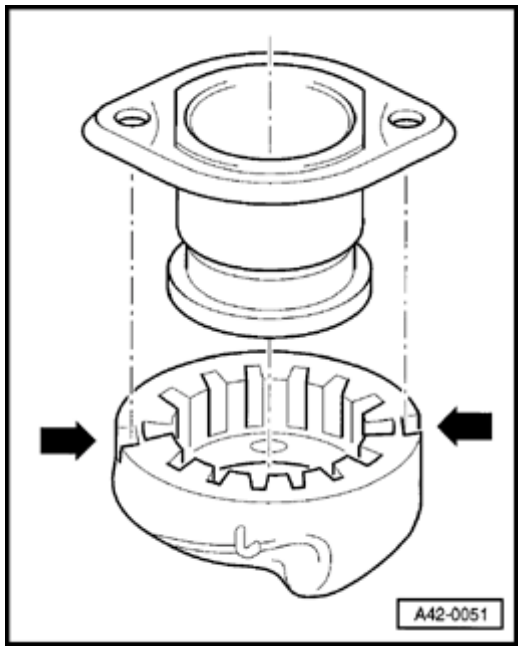


- End of coil spring ("Federanfang") must lie against recess of upper spring base (arrow).

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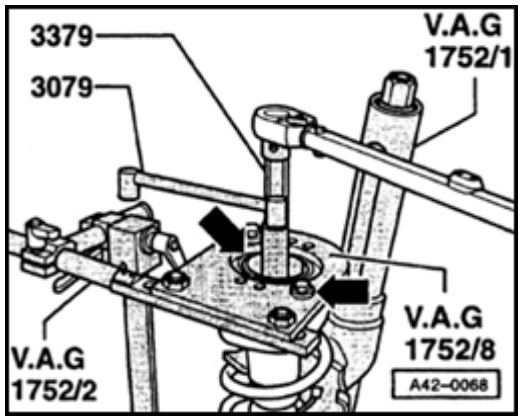
42-33

- Install upper spring retainer.



- Stamped nuts of spring retainer (arrows) must be located in recesses of spring base.

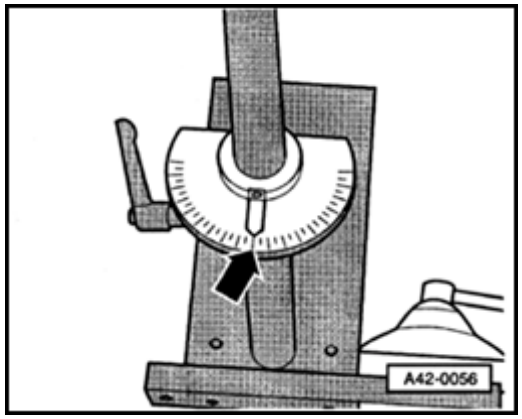
- Install mounting ring, dished washer and self-lock-nut.
- Mount VAG1752/8 adjustment gauge for struts onto VAG1752/2 spring mounting tool.



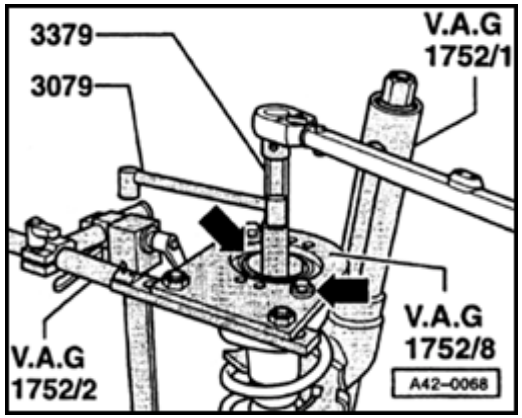
- Mount VAG1752/8 gauge onto upper spring retainer and tighten bolts.
- Lock VAG1752/2 spring mounting tool upper levers into position.

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42-34



- Loosen lower locking lever and turn upper spring retainer until scale of VAG1752/2 spring mounting tool is positioned at 0° .
- Make sure that ends of springs lie against stops.
- Secure locking lever in position.

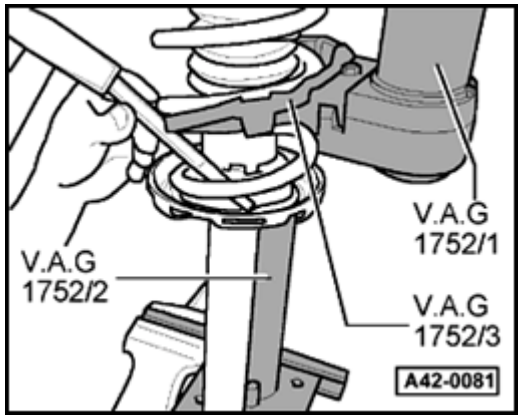


- Tighten self-locking nut using 3379 socket wrench insert and 3079 counter holder.

  Tightening torque: 25 Nm (18 ft lb)

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42-35



- Turn lower spring base and spring retainer (⇒ page 42-28 , items - 18 - and - 19 -) as necessary so that end of spring contacts stop.

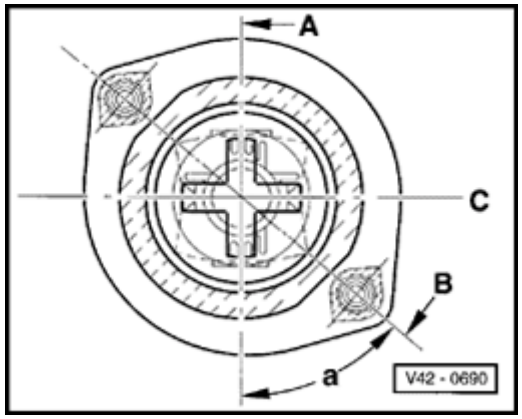
CAUTION!

Do not damage the surface of the spring when driving on the lower spring base - 19 - and the spring retainer - 18 -.

- Carefully release compressed coil spring.
  - Make sure that coil spring and upper and lower spring retainers are correctly positioned.
- Remove VAG1752/1 spring compressor after it is free.
- Unbolt VAG1752/8 adjustment gauge for struts and remove.
- Remove suspension strut from VAG1752/2 spring mounting tool.

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42-36



➢ Axis -C- of cap is offset 90° from axis -A- of shock absorber eye.

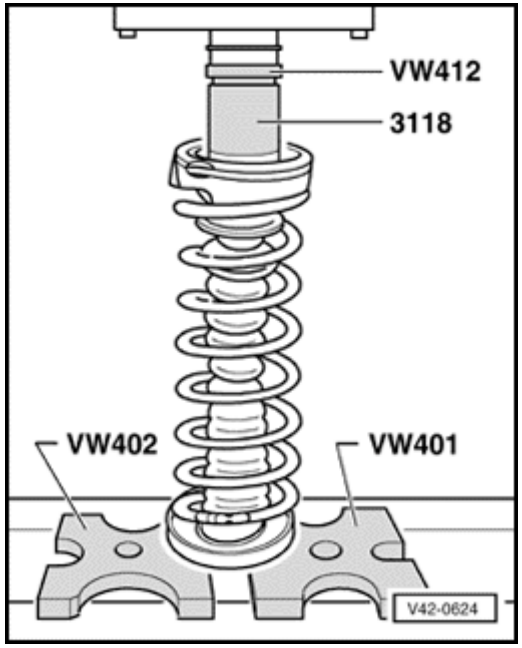
- Install cap onto upper spring retainer.

Note:

Lubricate O-ring with grease G 000 405 A2 before installing cap.

CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.



➢ - Use special tools to press in cap.

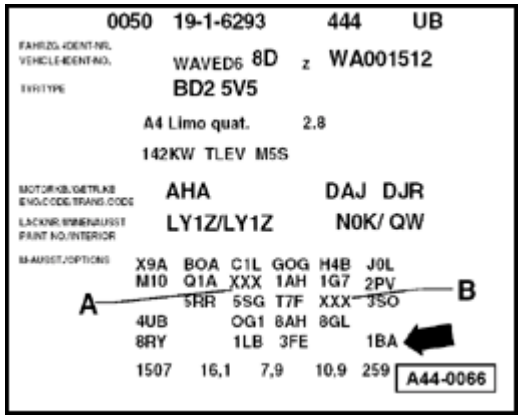
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42-37

Information on weight codes (code number)

Spring/shock assemblies will be classified according to weight codes (code number) so that suspension components can be matched easily.

The spring/shock assembly installed in the vehicle is indicated by the weight code on the vehicle data label.



Example of vehicle data label

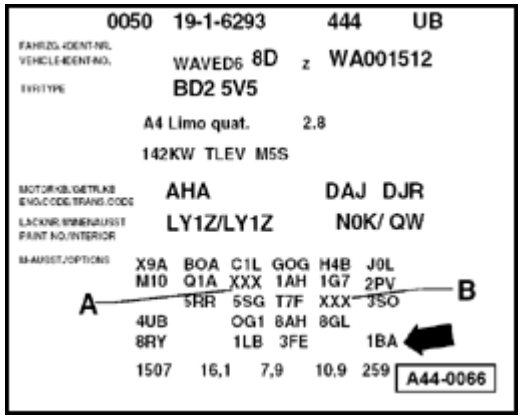
A - Weight code for front suspension

B - Weight code for rear suspension

The vehicle data label is located in the spare wheel well and in the vehicle Maintenance booklet.

The weight codes can be used to identify the correct spring/shock assemblies on the parts catalog microfiche.

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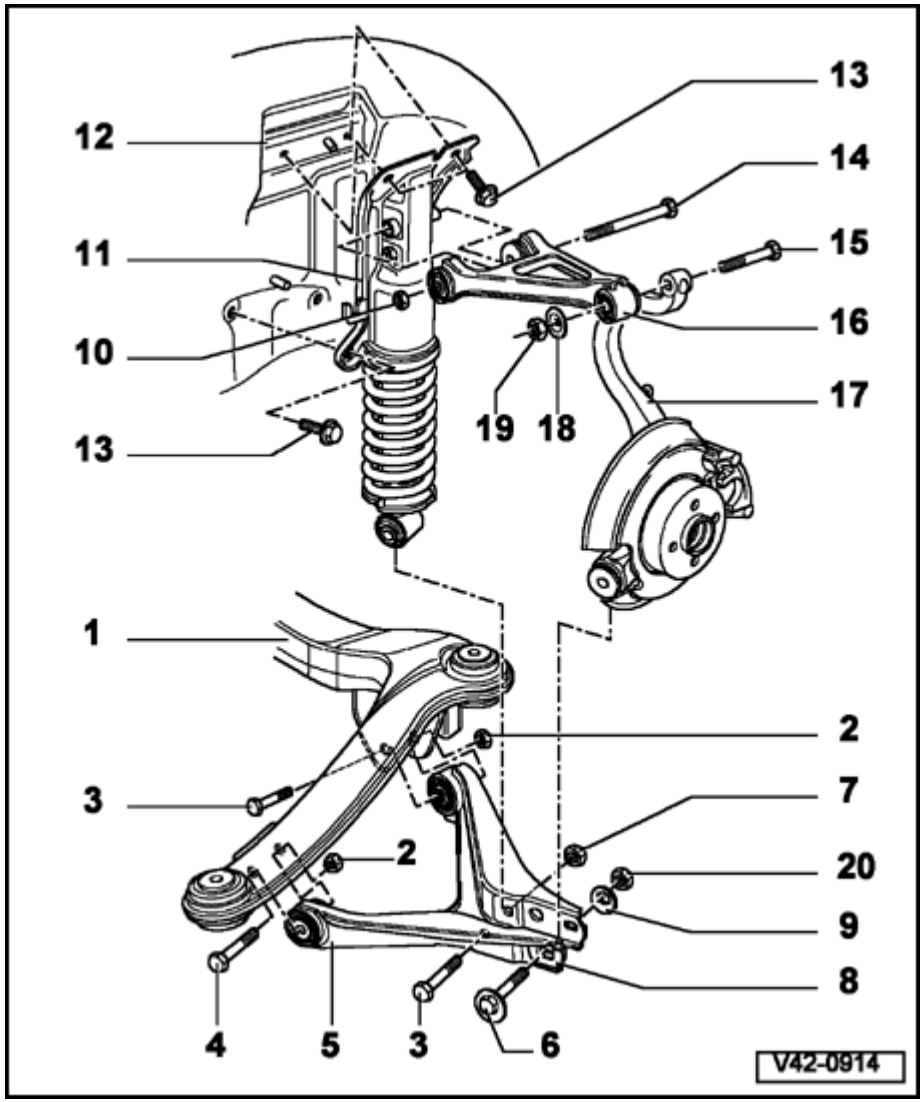


The weight code for the different suspension versions is indicated by the arrow in the illustration.

- 1BA: Standard suspension
- 1BB: Heavy duty suspension (approx. 20 mm (3/4 in.) higher)
- 1BC: Special purpose suspension
- 1BD: Sport suspension, Audi S4
- 1BE: Sport suspension
- 1BH: USA
- 1BT: Heavy duty suspension (approx. 7 mm or 1/4 in. higher)
- 1BP: Heavy duty suspension (same ride height as 1BA but with limited bump)

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42-39



Rear axle, servicing (all-wheel-drive vehicles)

WARNING!

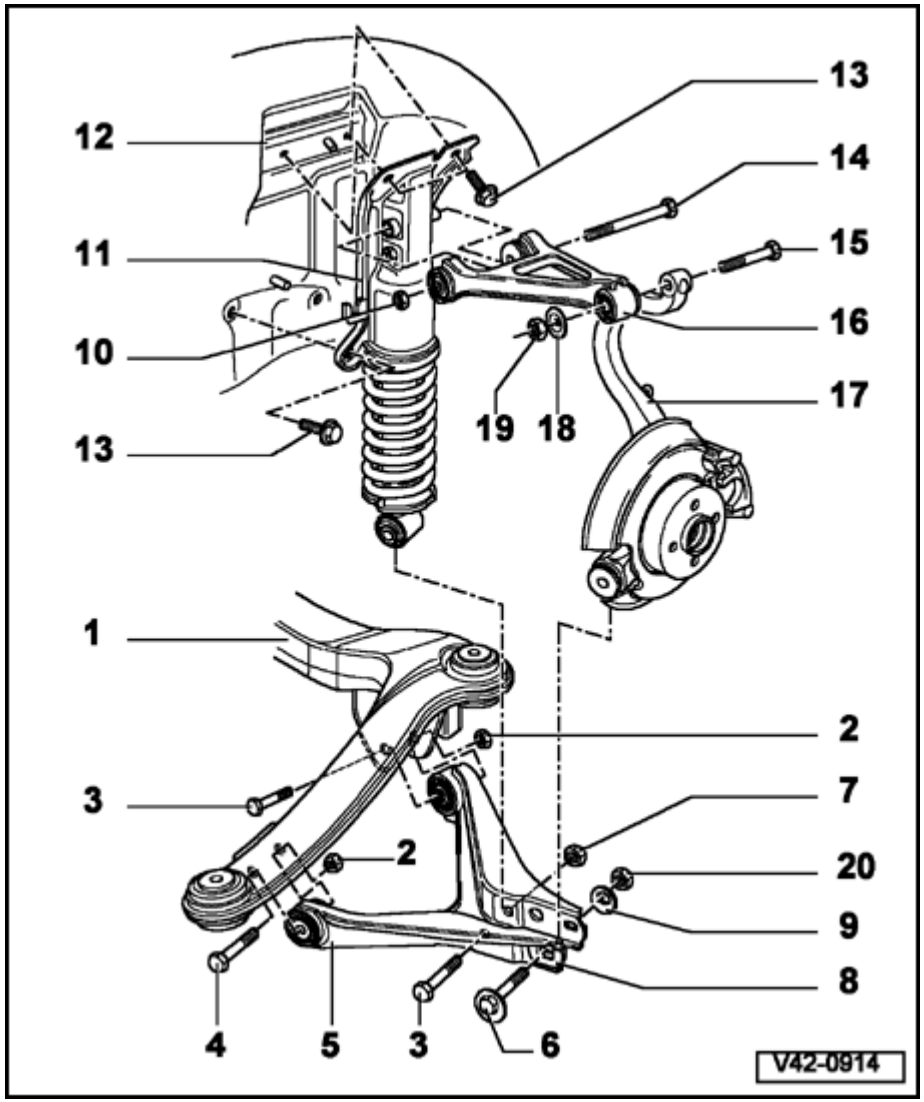
- ***Do not attempt to weld or straighten the load-bearing or wheel locating components of the rear suspension.***
- ***Do not re-use fasteners that are worn or deformed in normal use.***
- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

CAUTION!

Do not attempt to move a vehicle from which the drive axle has been removed. Otherwise wheel bearing damage will result. If the vehicle must be moved, install an outer CV joint in place of the drive axle.

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42-40



1 - Rear subframe

- After removing and installing, check wheel alignment and adjust if necessary ⇒ page 44-6
- Servicing ⇒ page 42-50
- Pay attention to removing and installing on vehicles with headlight range control ⇒ page 42-48

2 - Self-locking nut

- Always replace
- 70 Nm (52 ft lb) + 1/4-turn (90°)
- Vehicle must be standing on its wheels when tightening nut

3 - Bolt

- Always replace

4 - Bolt

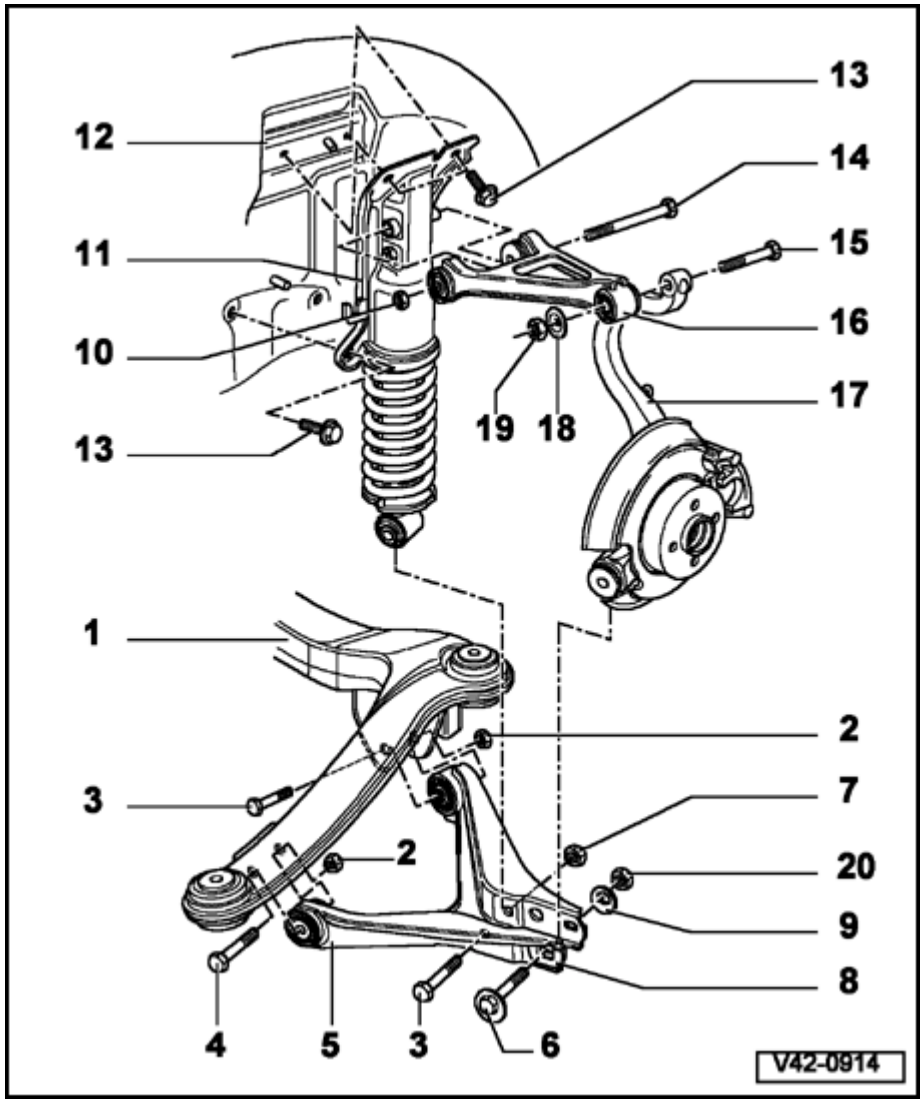
- Always replace

5 - Lower control arm

- Pay attention to removing and installing on vehicles with headlight range control ⇒ page 42-48
- Removing and installing ⇒ page 42-84
- Servicing ⇒ page 42-89

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42-41



6 - Eccentric bolt

- Adjusting axle camber ⇒ page 44-22
- Do not turn more than 90° from left or right of center position (90° is minimum or maximum adjustment)

7 - Self-locking nut

- Always replace
- 70 Nm (52 ft lb) + 1/4-turn (90°)
- Vehicle must be standing on its wheels when tightening nut

8 - Support for adjusting camber

- Welded to control arm on both sides
- Make sure that eccentric bolt and washer are correctly located

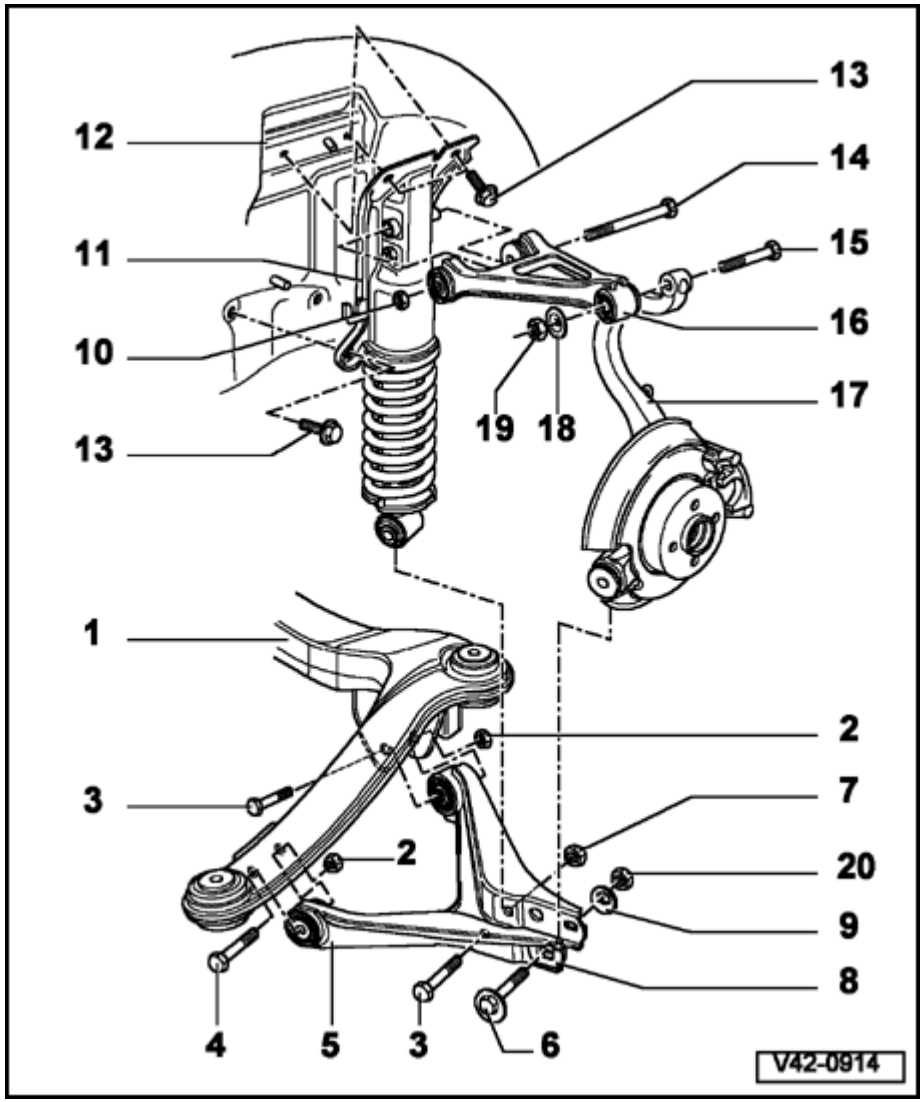
9 - Eccentric washer

10 - Self-locking nut

- Always replace
- 50 Nm (37 ft lb) + 1/4-turn (90°)
- When tightening, hold upper control arm horizontal
- Vehicle must be standing on its wheels when tightening nut

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42-42



11 - Suspension strut

- Removing and installing ⇒ page 42-65
- Servicing ⇒ page 42-68

12 - Wheelhousing

13 - Bolt + washer

- 55 Nm (41 ft lb)

14 - Bolt

- Always replace

15 - Bolt

- Always replace

16 - Upper control arm

- Removing and installing ⇒ page 42-65
- Servicing ⇒ page 42-81

17 - Wheel bearing housing

18 - Washer

- Always replace

19 - Self-locking nut

- Always replace
- 50 Nm (37 ft lb) + 1/4-turn (90°)

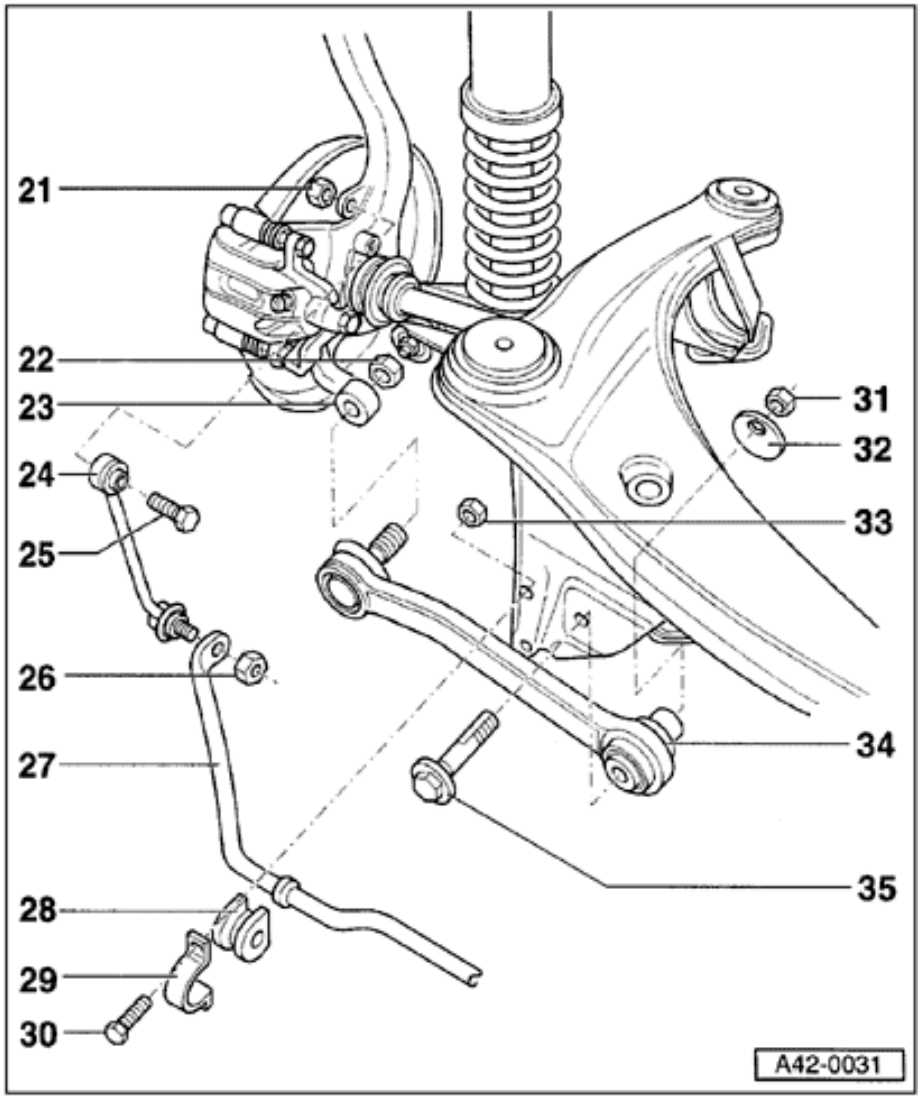
20 - Self-locking nut

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- Always replace
- 95 Nm (70 ft lb)

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42-43



21 - Self-locking nut

- Always replace
- 50 Nm (37 ft lb)

22 - Self-locking nut

- Always replace
- 50 Nm (37 ft lb)
- Vehicle must be standing on its wheels when tightening nut

23 - Wheel bearing housing

- Removing and installing ⇒ page 42-106
- Servicing ⇒ page 42-110

24 - Connecting link

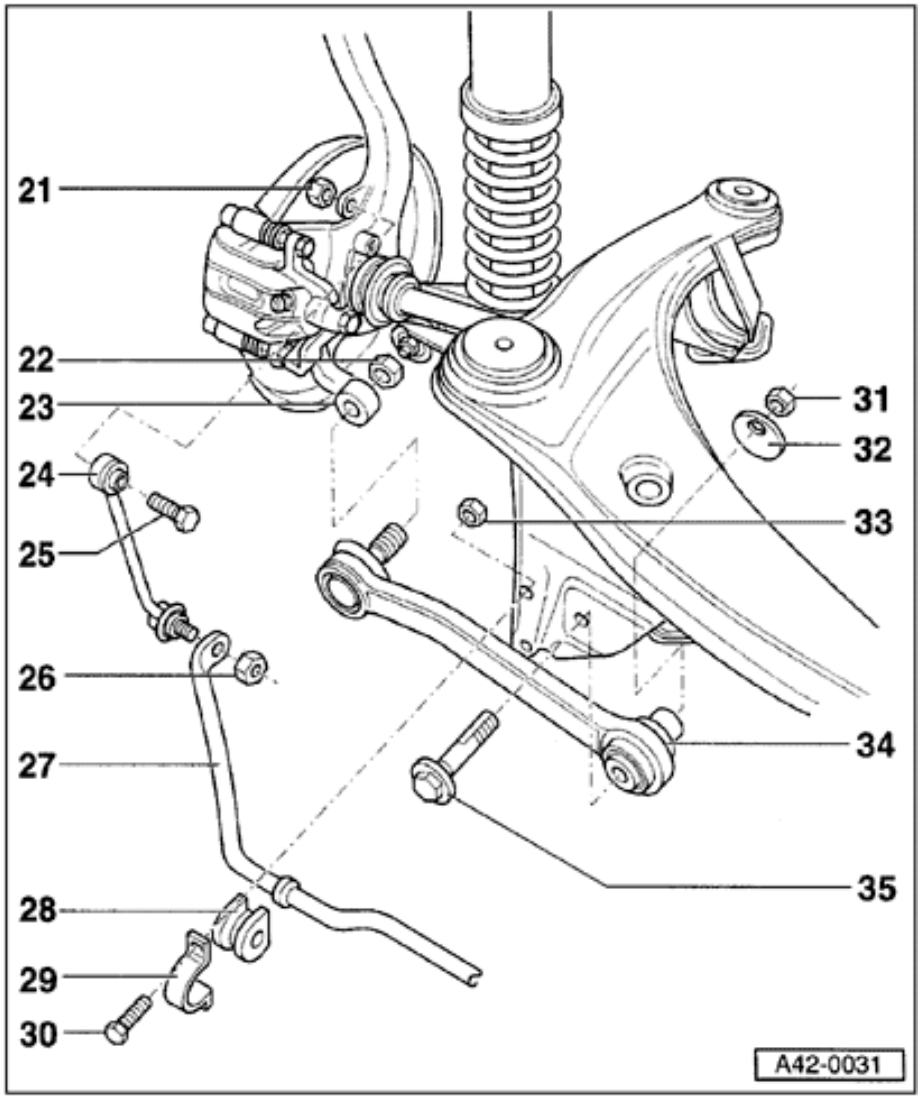
25 - Bolt

26 - Self-locking nut

- Always replace
- 40 Nm (30 ft lb)

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42-44



27 - Stabilizer bar

- Different versions depending on suspension version
- Before replacing, refer to vehicle data label to determine correct version ⇒ page 42-37

Suspension codes on data label:

- 1BA = Standard suspension
- 1BC = Special purpose suspension
- 1BP = Heavy duty suspension
- 1BE = Sports suspension
- 1BB = Heavy duty suspension
- 1BD = Audi S4
- 1BT = Heavy duty suspension

28 - Bushing

- Different versions depending on suspension version
- Before replacing, refer to vehicle data label to determine correct version ⇒ page 42-37

Suspension codes on vehicle data label:

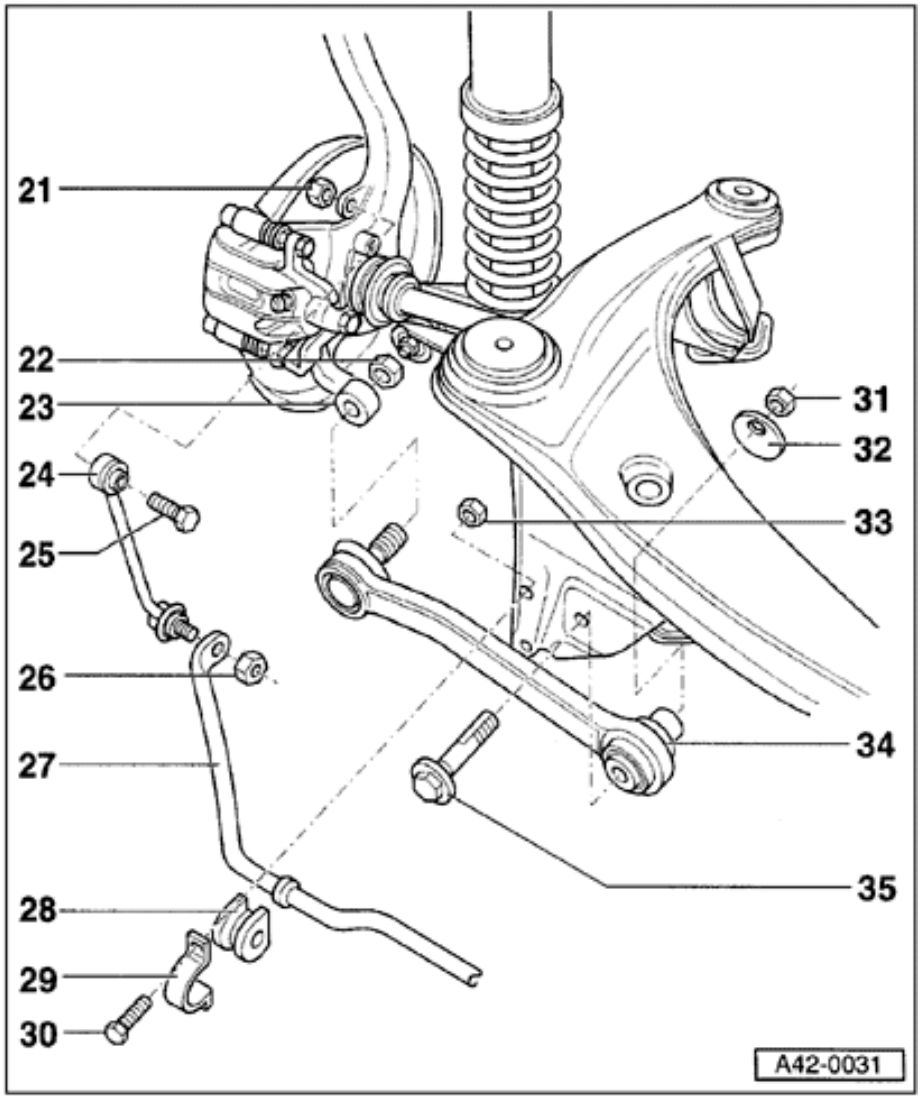
- 1BA = Standard suspension
- 1BC = Special purpose suspension

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- 1BP = Heavy duty suspension
- 1BE = Sports suspension
- 1BB = Heavy duty suspension
- 1BD = Audi S4
- 1BT = Heavy duty suspension

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42-45



29 - Bracket

30 - Bolt

- 25 Nm (18 ft lb)

31 - Self-locking nut

- Always replace
- 90 Nm (66 ft lb)
- Vehicle must be standing on its wheels when tightening nut

32 - Eccentric washer

33 - Self-locking nut

- Always replace

34 - Track rod

35 - Eccentric bolt for adjusting wheel toe

- Adjusting axle toe ⇒ page 44-23
- Do not turn more than 90° from left or right of center position (90° is minimum or maximum adjustment)

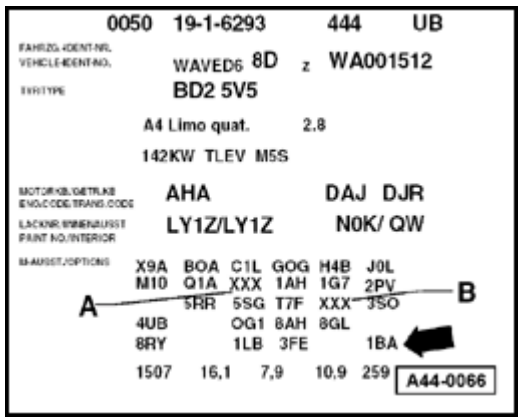
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42-46

Information on weight codes (code number)

From model year 1998 ➢, spring/shock assemblies will be classified according to weight codes (code number) so that suspension components can be matched easily.

The spring/shock assembly installed in the vehicle is indicated by the weight code on the vehicle data label.



➢ **Example of vehicle data label**

A - Weight code for front suspension

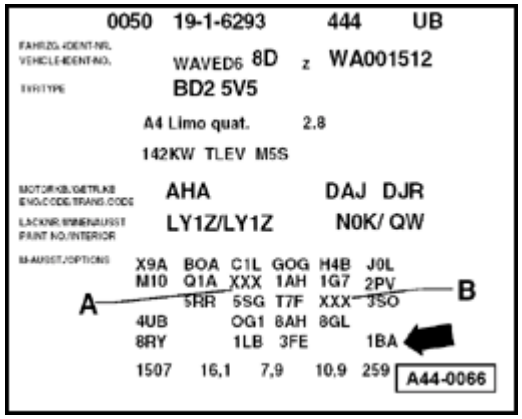
B - Weight code for rear suspension

The vehicle data label is located in the spare wheel well and in the vehicle Maintenance booklet.

The weight codes can be used to identify the correct spring/shock assemblies on the parts catalog microfiche.

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42-47

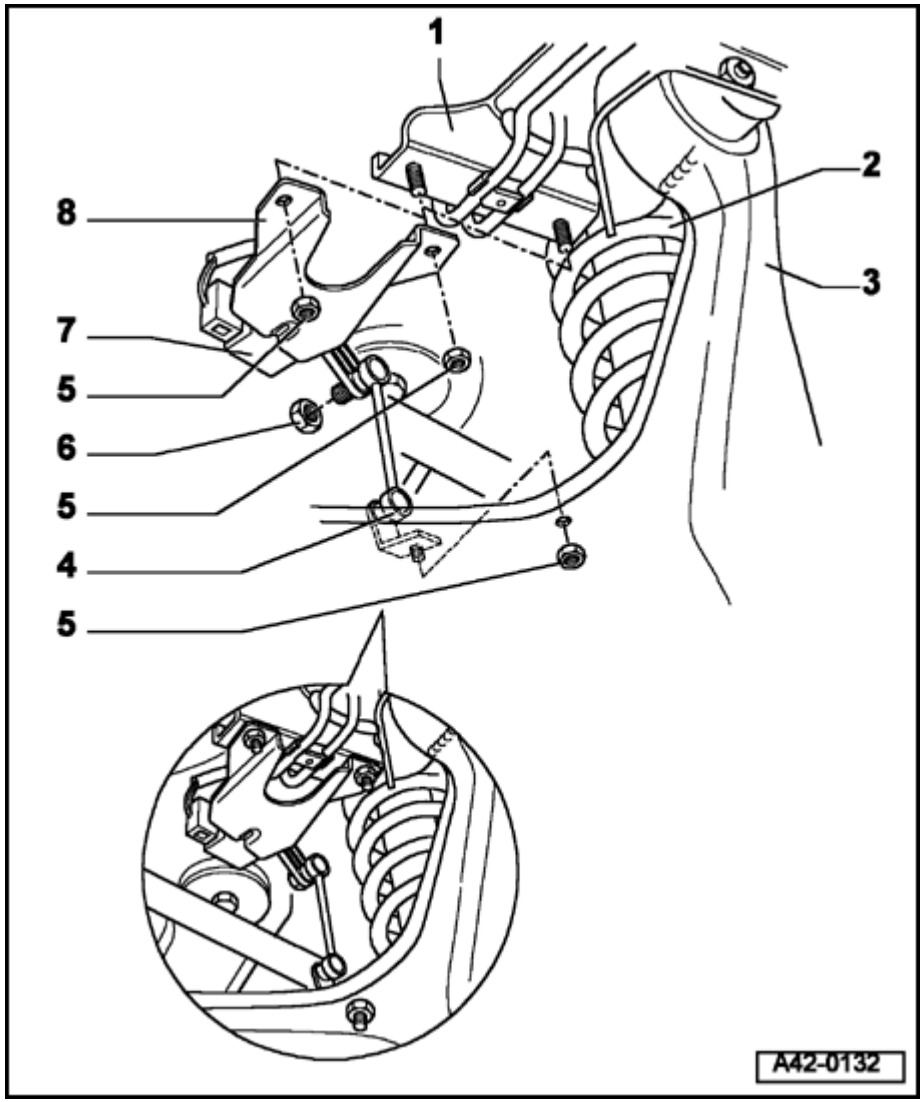


The weight code for the different suspension versions is indicated by the arrow in the illustration.

- 1BA: Standard suspension
- 1BB: Heavy duty suspension (approx. 20 mm (3/4 in.) higher)
- 1BC: Special purpose vehicles
- 1BD: Sport suspension, Audi S4
- 1BE: Sport suspension
- 1BH: USA
- 1BT: Heavy duty suspension (approx. 7 mm or 1/4 in. higher)
- 1BP: Heavy duty suspension (same ride height as 1BA but with limited bump)

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42-48



Headlight range control, removing and installing

As a running change in m.y. 1998 ➢ vehicles with xenon headlights may have a connection for the headlight range control installed in the left-rear of the headlight.

1 - Subframe

2 - Suspension strut

3 - Lower control arm

4 - Linkage for headlight range control

5 - Self-locking nuts

- 10 Nm (7 ft lb)

6 - Nut

- 3 Nm +1/-0 Nm (27 in. lb +9/-0 in. lb)
- Observe Note ⇒ page 42-49

7 - Sensor for headlight range control

8 - Mounting bracket

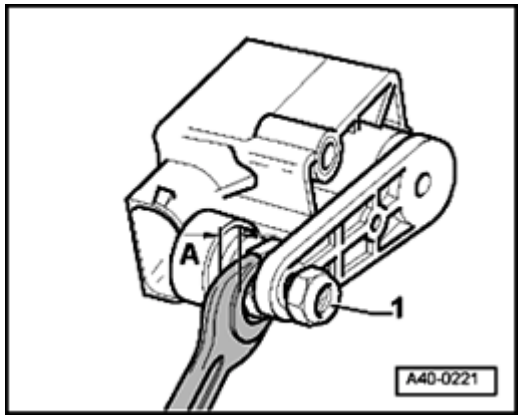
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42-49

When removing the rear axle or lower control arm It is essential to loosen the linkage for the headlight range control at lower control arm.

Note:

For mounting linkage to sensor for headlight range control use a 10 mm open end wrench with a thickness of distance -A-) to avoid damage to the seal



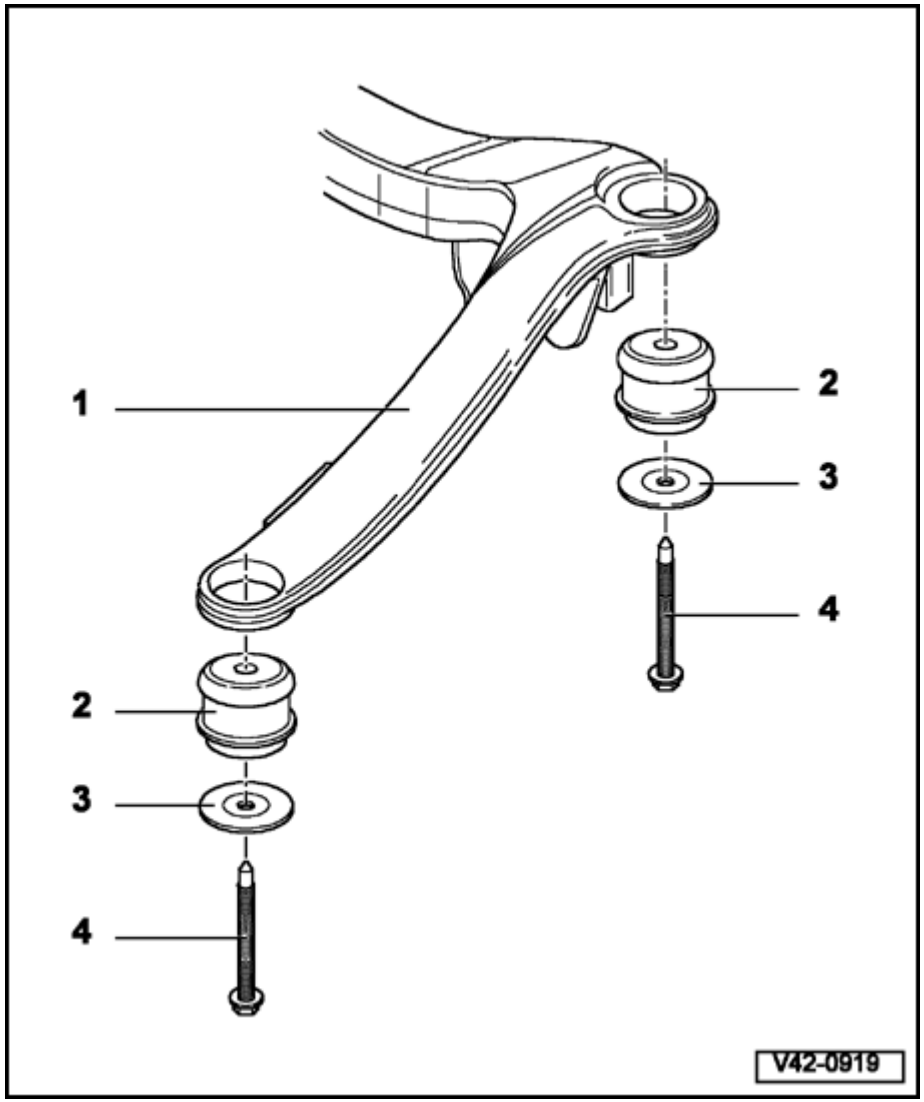
- Distance -A-: 4 mm (0.157 in.)
- Position -1- tightening torque: 3 Nm +1/-0 Nm (27 in. lb +9/-0 in. lb)
- Make sure sensor arm is properly aligned to linkage when installing headlight range control

Notes:

- *The linkage must be aligned vertically.*
- *The sensor arm must point outward and downward.*

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42-50



Subframe, servicing

WARNING!

Do not attempt to weld and/or straighten the axle beam.

CAUTION!

If using power tools (pneumatic or electric), do not tighten the bolted connections more than hand-tight. Otherwise, the specified tightening torques could be exceeded.

1 - Subframe

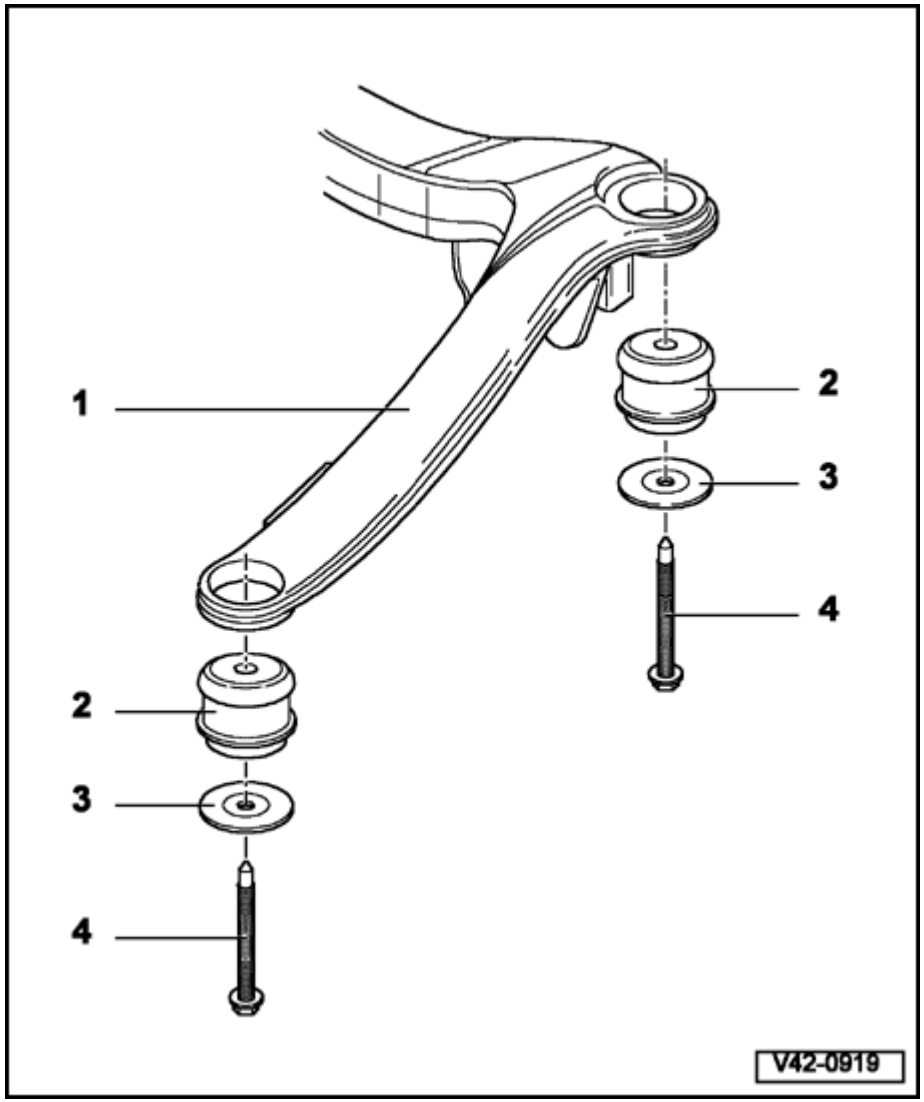
Tightening sequence (item - 4 -):

- 1. Right-rear
- 2. Left-rear
- 3. Right-front
- 4. Left-front

- Align rear axle after removal and installation ⇒ page 44-13
- Check and if necessary adjust wheel alignment after installing ⇒ page 44-13

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2 - Bonded rubber bushings

- Installation positions ⇒ Fig. 5

Front bushings:

- Pulling out ⇒ Fig. 1
- Pressing in ⇒ Fig. 2

Rear bushings:

- Pulling out ⇒ Fig. 3
- Pressing in ⇒ Fig. 4

Note:

Apply assembly lubricant G 294 421 A1 before installing.

CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

3 - Washer

- Always replace
- Ribbed side faces upward

4 - Combi-bolt

- Always replace

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♦ 110 Nm (81 ft lb) + 1/4-turn (90°)

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42-52

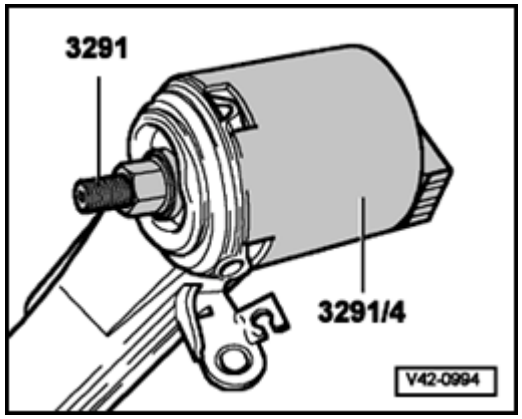


Fig. 1 Pulling out front bonded rubber bushing from subframe

- Assemble 3291/4 tubular section (pay attention to recesses) together with 3291 assembly device at right angle to subframe.
- Attach two brass washers in such a way that annular grooves are next to one another (3291 assembly device). Install washer and screw on nut.
- Pull out bonded rubber bushing by turning nut.

Note:

Insert hex head of 3291 assembly device into the recess in the 3291/4 tubular section. Apply grease to the annular grooves of the brass washers and to the threaded stem.

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42-53

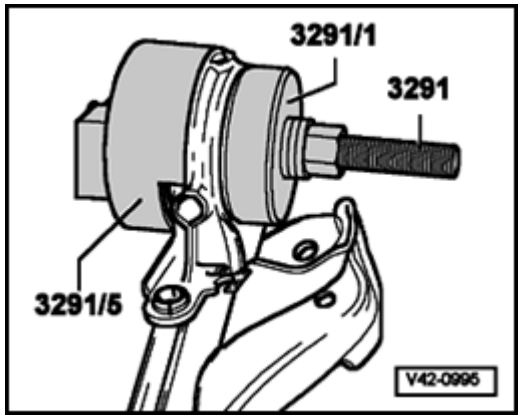


Fig. 2 Pressing in front bonded rubber bushing in subframe

- Apply lubricant (e.g. G 294 421 A1) when pressing in bonded rubber bushings.
- Assemble 3291/1 thrust piece to bonded rubber bushing and insert at right angle into hole in subframe using 3291/5 tubular section (pay attention to recesses) and 3291 assembly device.
- Attach two brass washers with annular grooves facing one another and to 3291 assembly device.
- Install washer and screw on nut.
- Press in bonded rubber bushing fully by turning nut.
  - While pulling in, hold 3291/1 thrust piece or bonded rubber bushing by hand to prevent turning.

Note:

Insert hex head of 3291 assembly device into the recess of 3291/5 tubular section. Apply grease to the annular grooves of the brass washers and to the assembly device.

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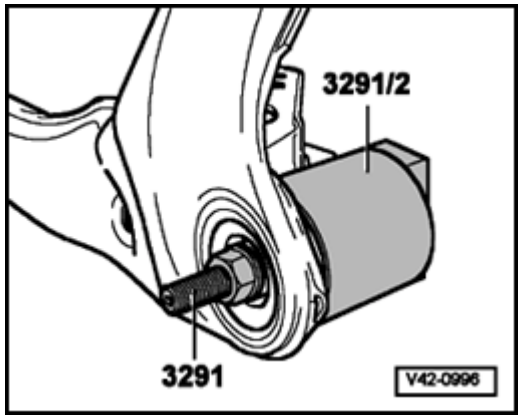


Fig. 3 Pulling out rear bonded rubber bushing from subframe

- Assemble 3291/2 tubular section together with 3291 assembly device at right angle to subframe.
- Attach two brass washers with annular grooves next to one another and to 3291 assembly device. Install washers and screw on nut.
- Pull out bonded rubber bushing by turning nut.

Note:

Insert hex nut of 3291 assembly device into recess in 3291/2 tubular section. Apply grease to the annular grooves of the brass washers and to the assembly device.

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42-55

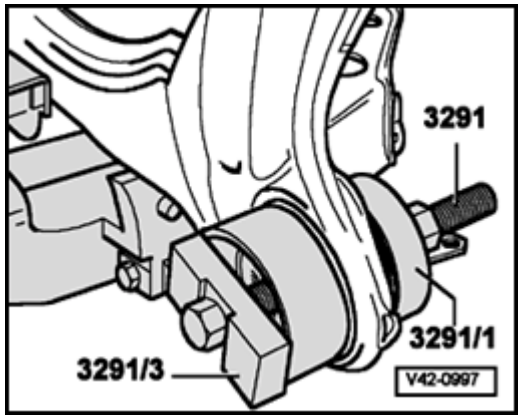


Fig. 4 Pressing in rear bonded rubber bushing in subframe

- Apply lubricant (e.g. G 294 421 A1) when pressing in bonded rubber bushings.
- Attach 3291/1 thrust piece to bonded rubber bushing and insert at right angle into hole in subframe using 3291/3 tubular section and 3291 assembly device.
- Attach two brass washers with annular grooves next to one another and to 3291 assembly device.
- Install washer and screw on nut.
- Press in bonded rubber bushing fully by turning nut.
  - While pulling in, hold 3291/1 thrust piece or bonded rubber bushing by hand to prevent turning.

Note:

Insert hex nut of 3291 assembly device into recess in 3291/3 tubular section. Apply grease to the annular grooves of the brass washers and to the assembly device.

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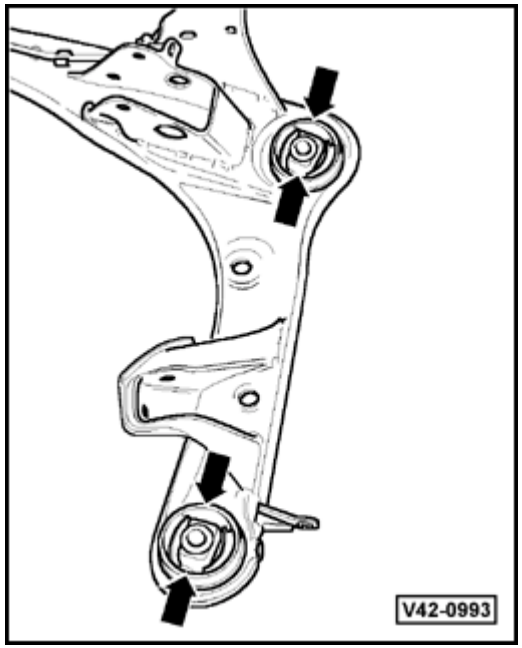


Fig. 5 Installation positions of bonded rubber bushings in rear subframe

Note:

The kidney-shaped recesses (arrows) must be parallel to the center line of the vehicle. Max. deviation of 10° to left or right is permissible.

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Rear axle, removing and installing (all-wheel-drive vehicles)

Special tools, test equipment and auxiliary items

- VAG1752/1 spring compressor
- VAG1752/3 adaptor with protective linings
- VAG1383A engine/transmission lifter
- VAG1359/2 universal mount

Removing

- Remove rear center console:

⇒ *Repair Manual, Body Interior, Repair Group 70*

- Remove both rear wheels.
- Disconnect exhaust system at clamp and remove rear section of exhaust system.

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CAUTION!

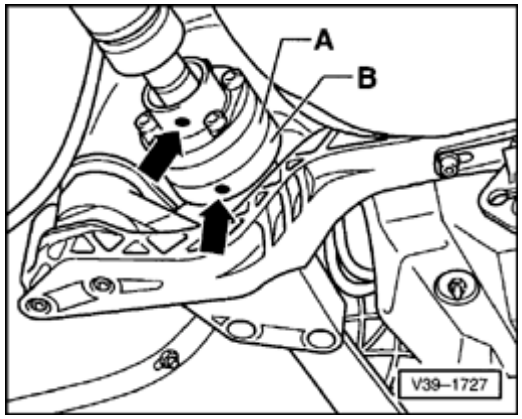
Do not deflect the isolating element at the front exhaust pipe more than 10° otherwise it could become damaged.

- Remove rear heat shield for driveshaft.

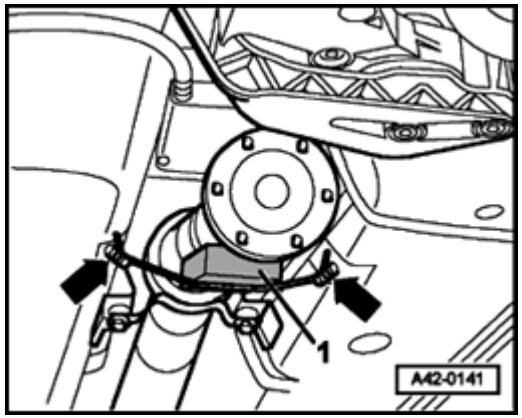
- If applicable, suspend exhaust pipe together with three-way catalytic converter from driveshaft center bearing.

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- Check for factory markings (colored dots -arrows-) for aligning drive flange on driveshaft -A- to drive flange on rear final drive -B-. If necessary, apply colored dots (arrows).
- Remove bolts from drive flange.



- Support driveshaft using wire attached to underside of vehicle (arrows) and place wooden block -1- below driveshaft.
- Remove parking brake cables:

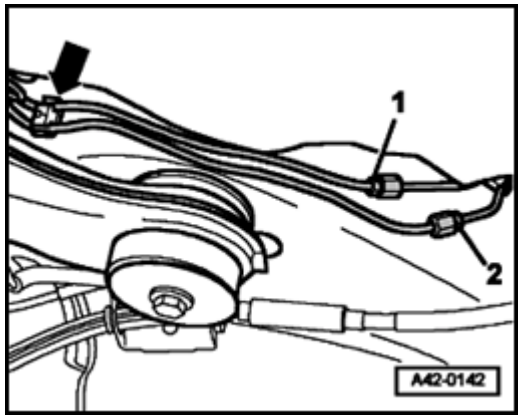
⇒ *Repair Manual, Brake System, Repair Group 46*

Note:

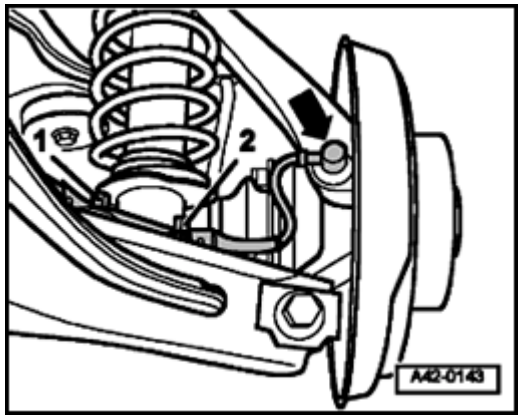
If the same rear axle is to be re-installed, only disconnect the parking brake cables at the parking brake lever, underbody and at the fuel tank. Leave the parking brake cables in position at the rear axle and at the brake calipers.

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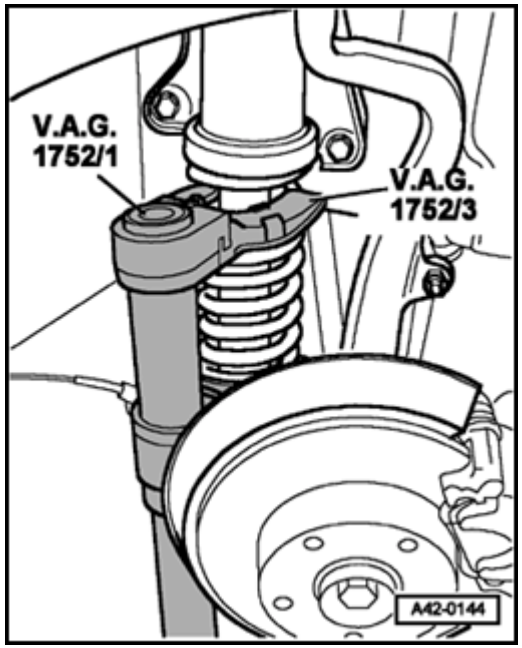
- Disconnect brake lines at fittings -1- and -2- at left-rear below vehicle.
- Unclip brake lines from holder (arrow) below vehicle.



- Remove holders -1- and -2- for wiring to ABS wheel speed sensors -G44- and -G46- at lower control arm.
- Pull ABS wheel speed sensors -G44- and -G46- (arrow) out of wheel bearing housing.
- Unhook wiring for wheel speed sensors at front of subframe.

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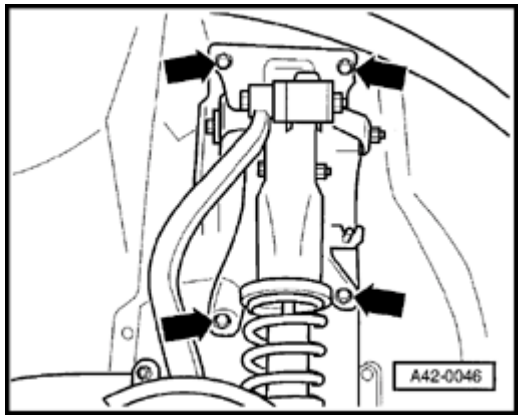
- Attach VAG1752/1 spring compressor and spring holder with VAG1752/3 adaptor and protective linings at second and next to last coils of coil spring.
- Compress coil spring.

Note:

On vehicles with headlight range control, the linkage for the headlight range control must be disconnected to remove the rear axle or lower control arm ⇒ page 42-48 .

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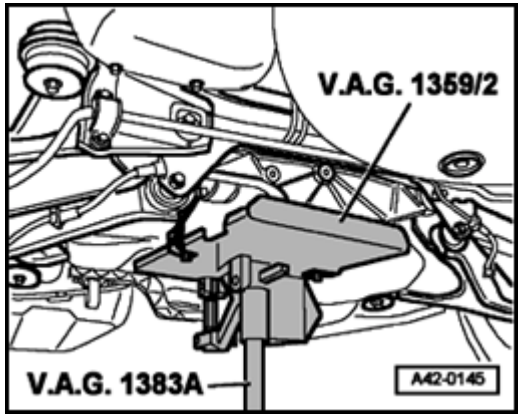


- While coil spring is still compressed, remove bolts (arrows) from suspension strut mounting bracket.
- Swivel suspension strut outward at top and relieve coil spring tension.

CAUTION!

Be careful not to damage the edge of the wheelhousing.

- Using above procedure, remove suspension strut from opposite side.
- Remove exhaust system bracket from rear final drive.



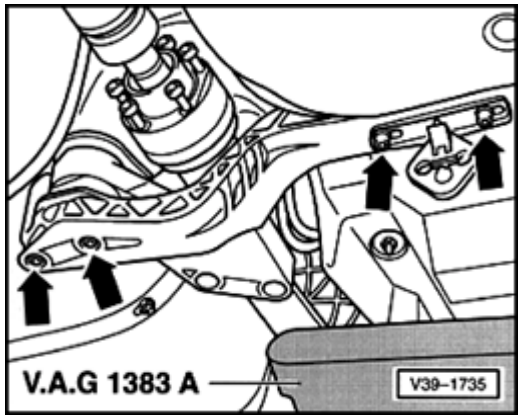
- Support final drive using VAG1383A engine/transmission lifter and VAG1359/2 universal mount.
- Secure rear final drive with strap.

CAUTION!

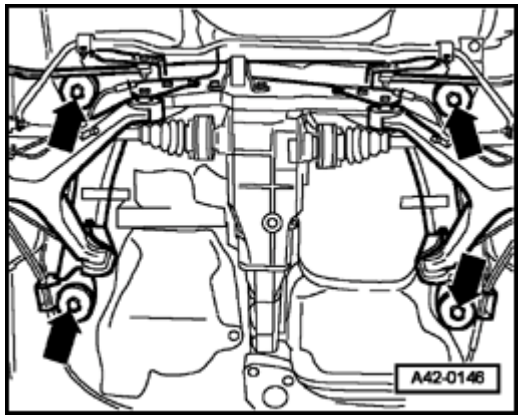
Be careful not to damage the fuel tank.

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- Remove bolts (arrows) at front cross member for rear final drive.



- Remove four subframe bolts (arrows).
- Slowly lower subframe together with rear final drive.

CAUTION!

Be careful not to damage the edge of the wheelhousing.

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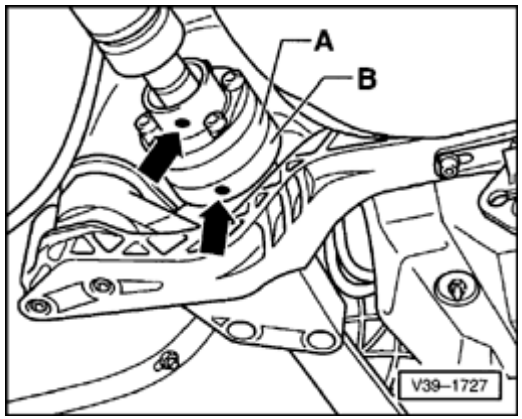
Installing

Installation is the reverse of removal. Observe the following:

CAUTION!

Any residual paint, residual adhesive and/or corrosion in the threads/splines must be removed.

Note:



To prevent imbalance, drive flange -A- on driveshaft and drive flange -B- on rear final drive must be installed with colored markings aligned (arrows).

- Replace gasket between driveshaft and rear final drive drive flanges.
  - Peel off protective backing and bond gasket to drive flange.
    - Bonding surface must be free of grease
- Replace driveshaft bolts (self-locking).
- Bleed brake system:

⇒ *Repair Manual, Brake System, Repair Group 47*

- Adjust parking brake:

⇒ *Repair Manual, Brake System, Repair Group 46*

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- Adjust toe and camber at rear axle ⇒ page 44-6 .

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- Align exhaust system free of stress:

Repair Manual, Engine Mechanical, Repair Group 26

- Replace four subframe bolts and washers.

  Installation position of washers: ribbed side facing upward

Tightening torques

Component/location		Tightening torque
Subframe to body		110 Nm (81 ft lb) + 1/4-turn (90°)1)
Suspension strut mounting bracket to body		55 Nm (41 ft lb)
Drive shaft to rear final drive	M8	55 Nm (41 ft lb)
Rear final drive front crossmember to body	M10	40 Nm (30 ft lb)
Rear final drive front crossmember (with exhaust system bracket) to body	M8	20 Nm (15 ft lb)

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Drive axle to rear final drive	M8	40 Nm (30 ft lb)
	M10	80 Nm (59 ft lb)
1) Always replace bolt		

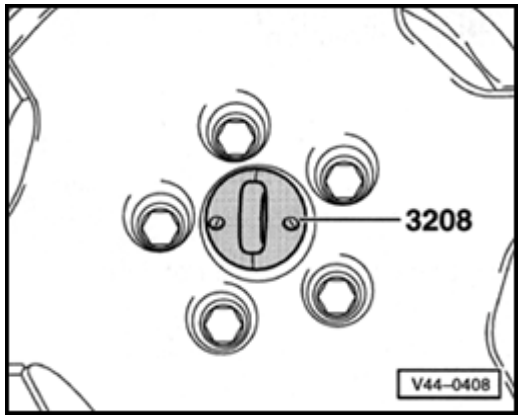
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42-65

Suspension strut and upper control arm, removing and installing

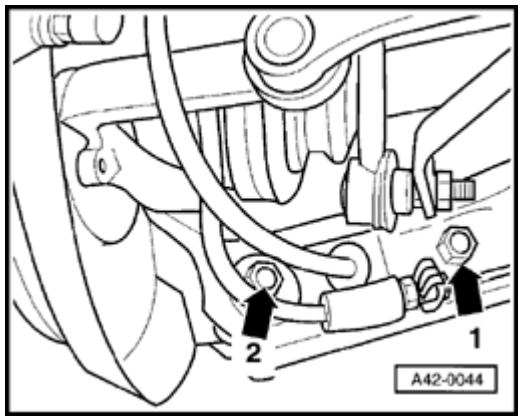
Removing

- Vehicle must be standing on its wheels above vehicle lift



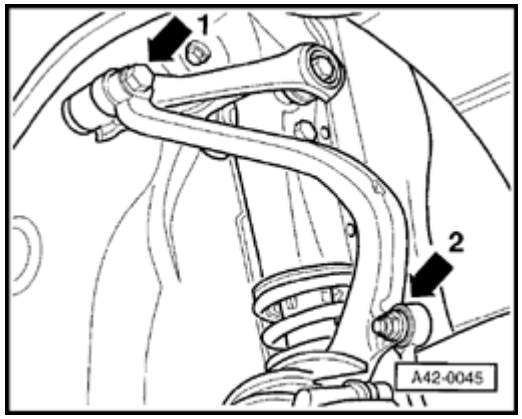
- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap
- Loosen wheel bolts.
- Raise vehicle on lift.
- Remove wheel.

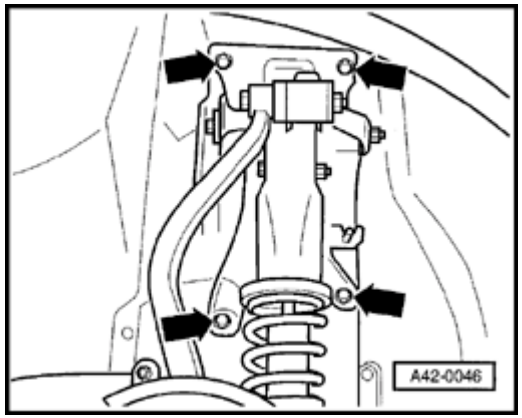


- Loosen bolted connection of lower control arm to suspension strut (arrow -1-) ⇒ page 42-40 .

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- Loosen bolts from wheel bearing housing to upper control arm (arrow -1-) ⇒ page 42-42 .



- Remove suspension strut mounting bracket bolts (arrows), push wheel bearing housing down and remove suspension strut along with control arm.
- Remove bolts from shock absorber to upper control arm (⇒ page 42-42), and remove control arm.

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Installing

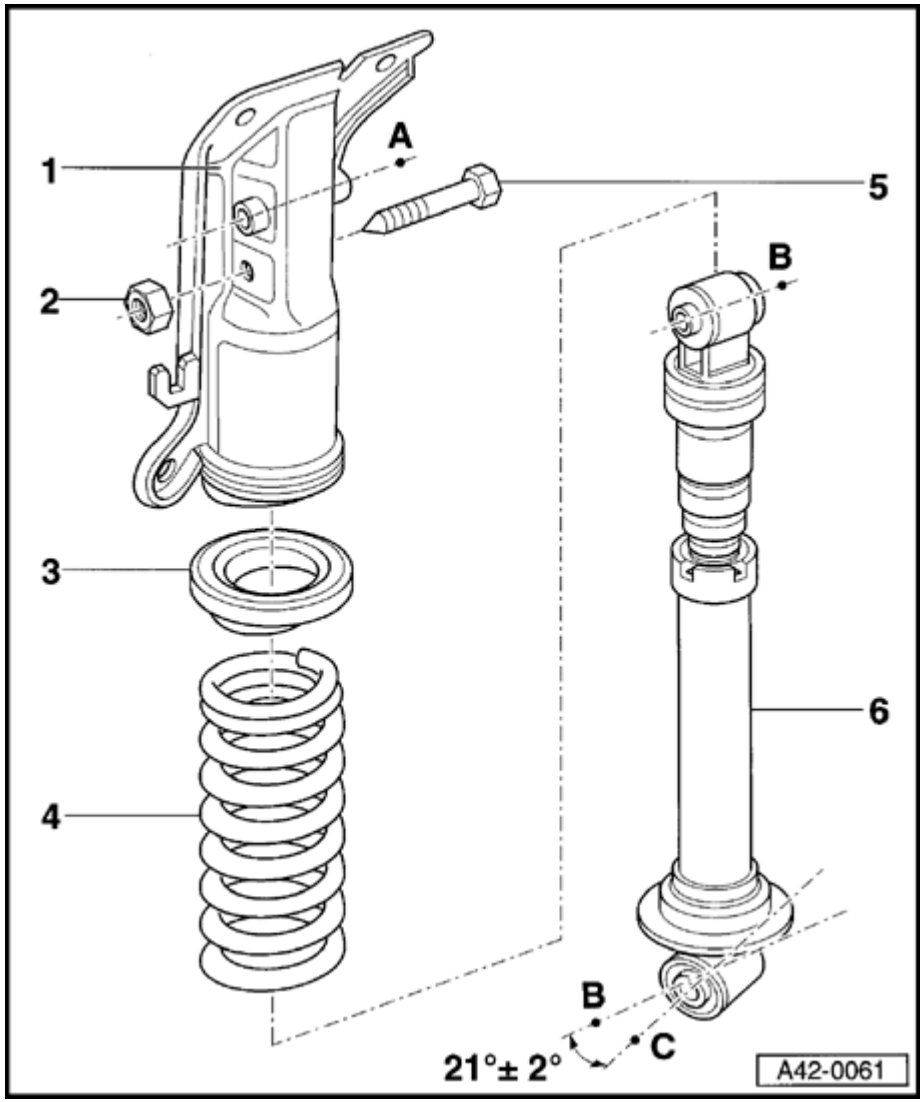
- Install in reverse order of removal.

CAUTION!

Bonded rubber bushings can only be turned to a limited extent. The bolted connection between the wheel bearing housing to upper control arm and the connection between the shock absorber to lower control arm must only be tightened when the vehicle is standing on the ground. Otherwise the bonded rubber bushings will be subjected to a torsional stress resulting in shortened service life

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Suspension strut, servicing

Disassembling and assembling suspension strut ⇒ page 42-71

1 - Suspension strut mounting bracket

- Different versions on left and right-sides

2 - Self-locking nut

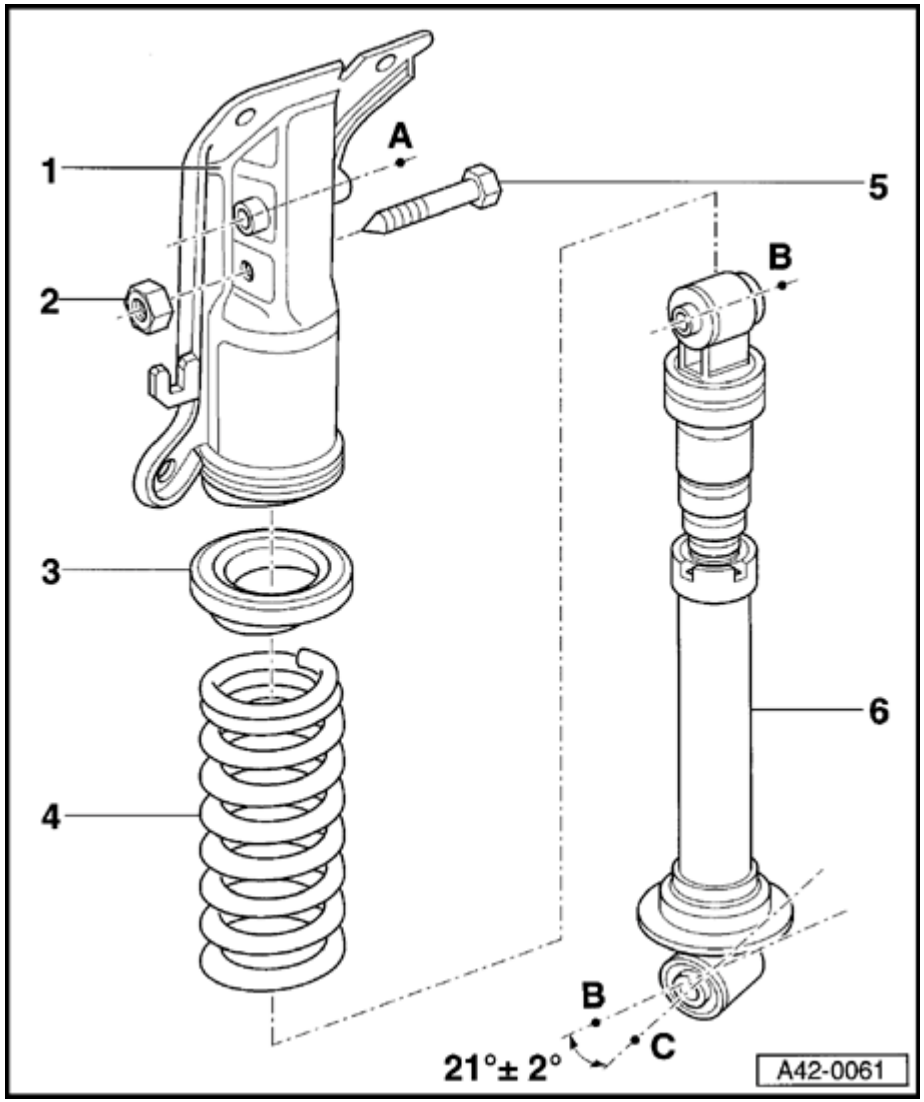
- Always replace
- 70 Nm (52 ft lb) + 1/4-turn (90°)

3 - Damper ring

- Install with stop resting against end of spring

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4 - Coil spring

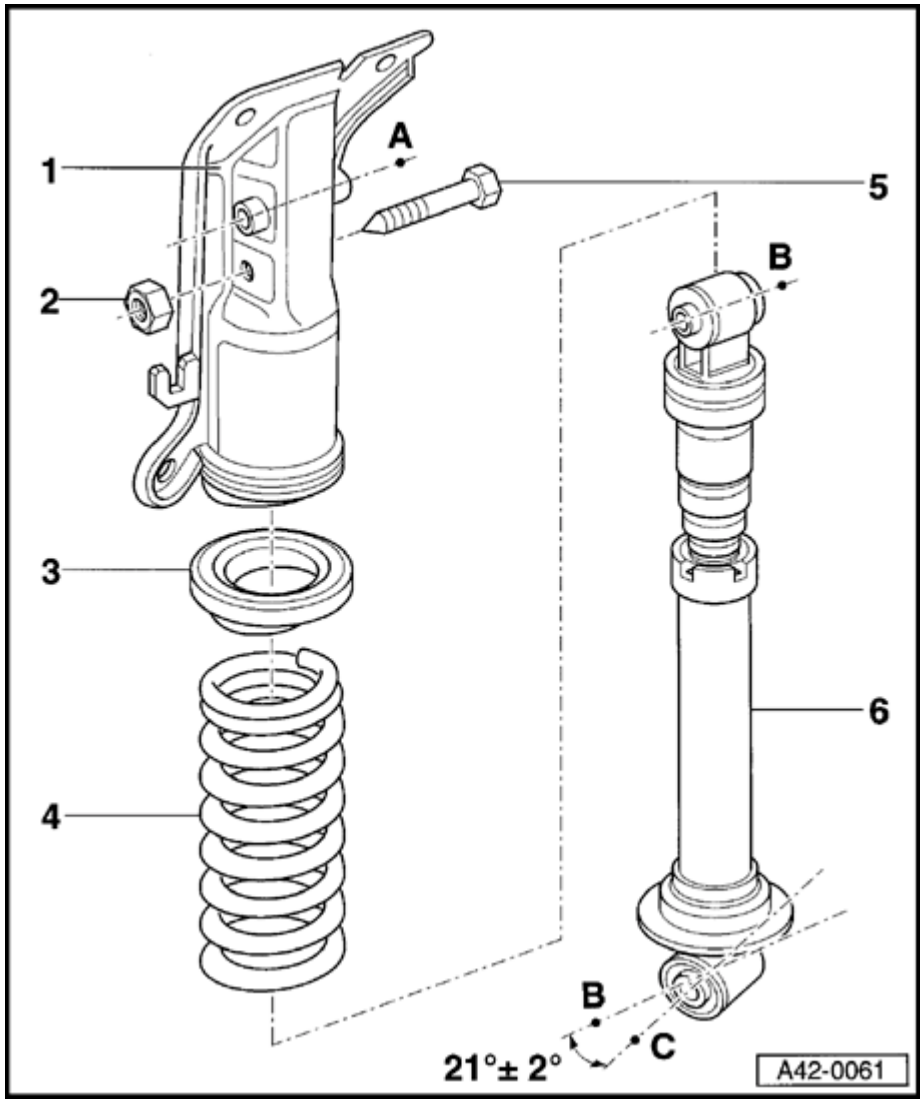
- Always replace on both sides
- Different versions depending on suspension version ⇒ vehicle data label, page 42-46 to determine correct spring version
- Install on shock absorber and turn so that end of spring coil is resting against stop of lower spring retainer
- Installation position: colored marking on spring faces down toward spring retainer
- If suspension strut is correctly installed, bottom end of spring on left side faces toward rear; bottom end on right-side faces toward front

5 - Bolt

- Always replace

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6 - Gas shock absorber

- Different versions ⇒ parts catalog microfiche
- Supplied as replacement part with lower spring retainer pressed on
- Different versions depending on suspension version ⇒ vehicle data label, page ⇒ Page 42-46
- Malfunctioning shock absorbers must be disposed of properly
- Checking for leaks and noises ⇒Special Information binder

Installation position:

- Angle between suspension strut mounting bracket axis -A- and shock absorber axis -B- = 0°
- Angle between axis -B- and axis -C- = 21° ± 2°; Pay attention to this when assembling

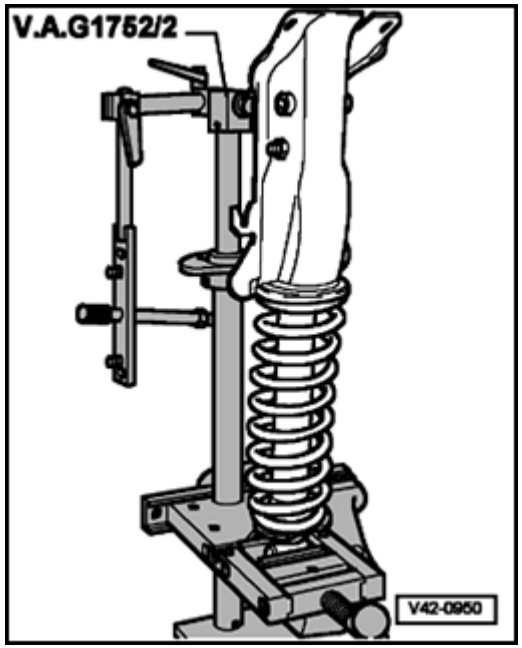
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42-71

Disassembling and assembling suspension strut

Disassembling

- Remove suspension strut ⇒ page 42-65 .



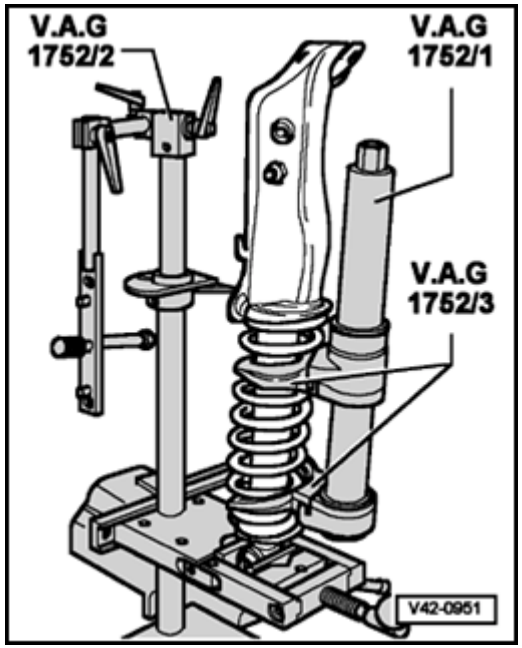
- Install suspension strut into VAG1752 spring tensioner.

Note:

Illustration shows left-hand suspension strut.

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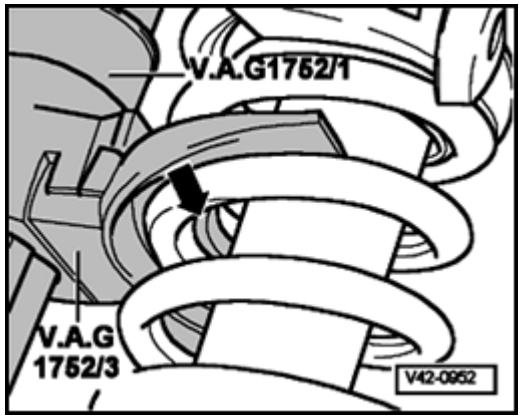
42-72



- Insert VAG1752/1 spring compressor.

WARNING!

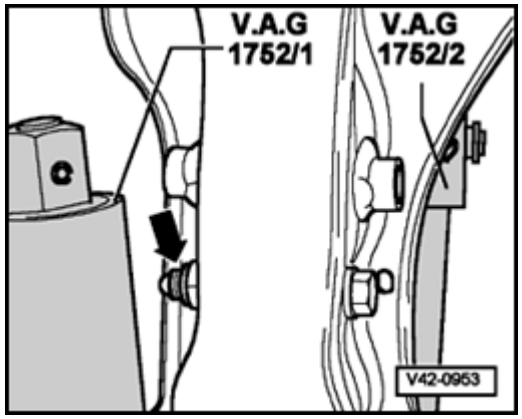
Make sure the coil spring is seated correctly in the VAG1752/3 adapter (arrow).



- Compress coil spring using VAG1752/1 spring compressor until upper shock absorber mount is free.

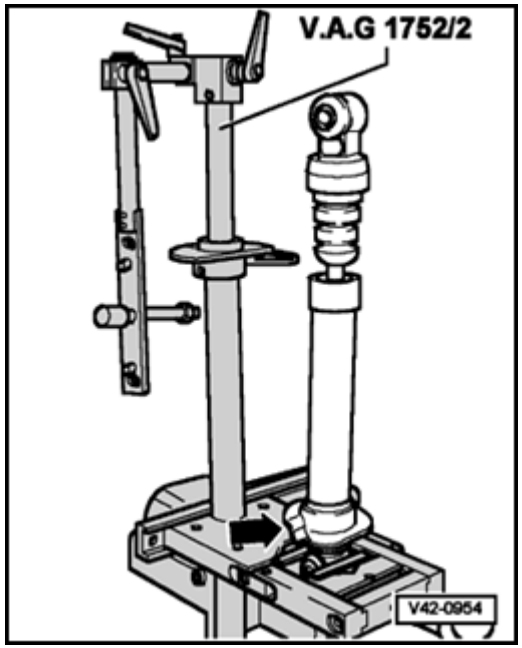
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- Remove nut (arrow) and bolt.
- Remove suspension strut mounting bracket and damper ring.
- Remove compressed spring together with VAG1752/1 spring compressor.
- Remove faulty shock absorber from VAG1752 suspension strut tensioner and dispose of properly.

Assembling



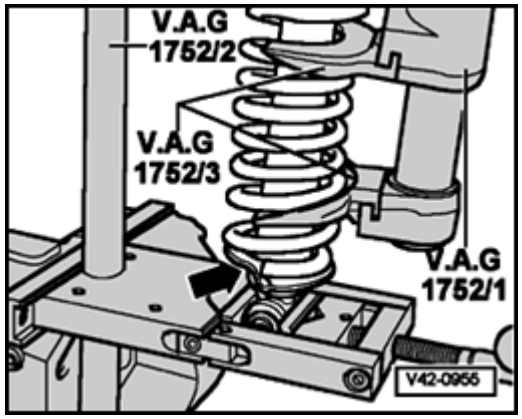
- Clamp new shock absorber into VAG1752 suspension strut tensioner, as shown.

Note:

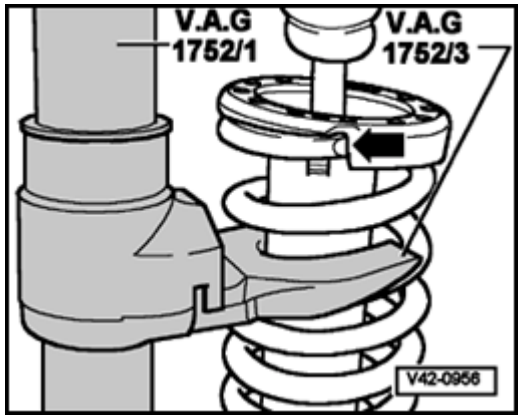
Pay attention to the position of the step on the lower spring retainer (arrow).

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- Compress new coil spring using VAG1752/1 spring compressor.
- Fit compressed coil spring onto shock absorber.
  - Colored marking on coil spring must be facing down toward spring retainer
  - End of spring coil should be resting against stop of spring retainer (arrow)

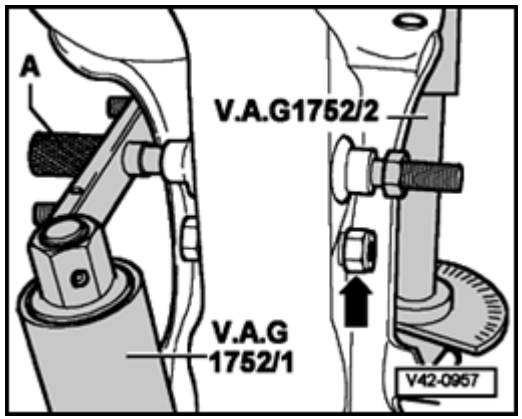


- Install damper ring so that end of spring coil is resting against stop of damper ring (arrow).

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42-75

- Install suspension strut mounting bracket.

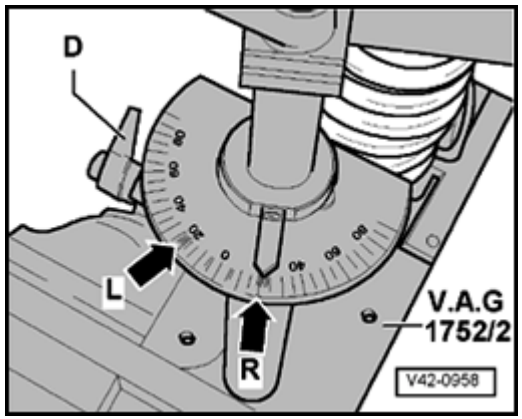


- Install securing bolt into suspension strut mounting bracket and screw on nut (arrow) loosely.

Note:

Nut faces in direction of travel!

- Install locating bolt -A- into suspension strut mounting bracket and secure loosely with nut.



- Turn suspension strut mounting bracket until pointer on degree scale (on VAG1752 suspension strut tensioner) is pointing to 21° ± 2° (with locking bolt -D- loose) and ...

L - left-hand suspension strut

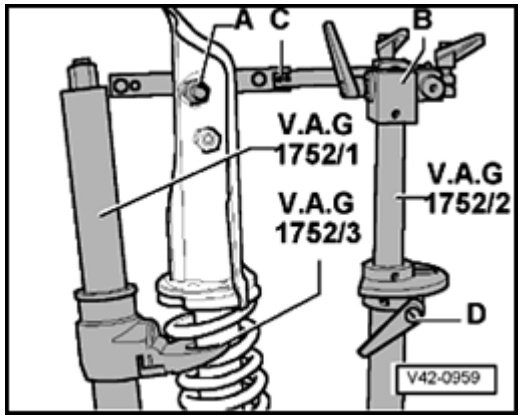
R - right-hand suspension strut

Note:

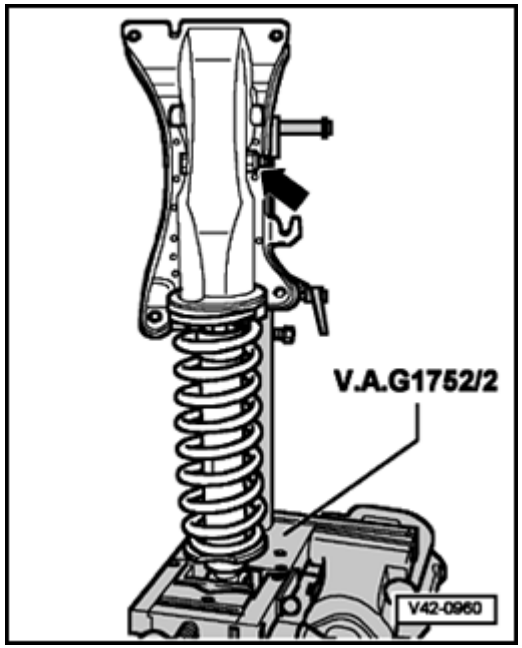
Illustration shows the position of the degree scale when assembling the right-hand suspension strut.

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- ... move lever arm -C- with locating bolt -A- perpendicular to height adjuster -B-.
- Tighten locking bolt -D-.
- Relieve tension from compressed coil spring and remove VAG1752/1 spring compressor.
- Remove locating bolt -A- from suspension strut mounting bracket.



- Tighten nut (arrow).

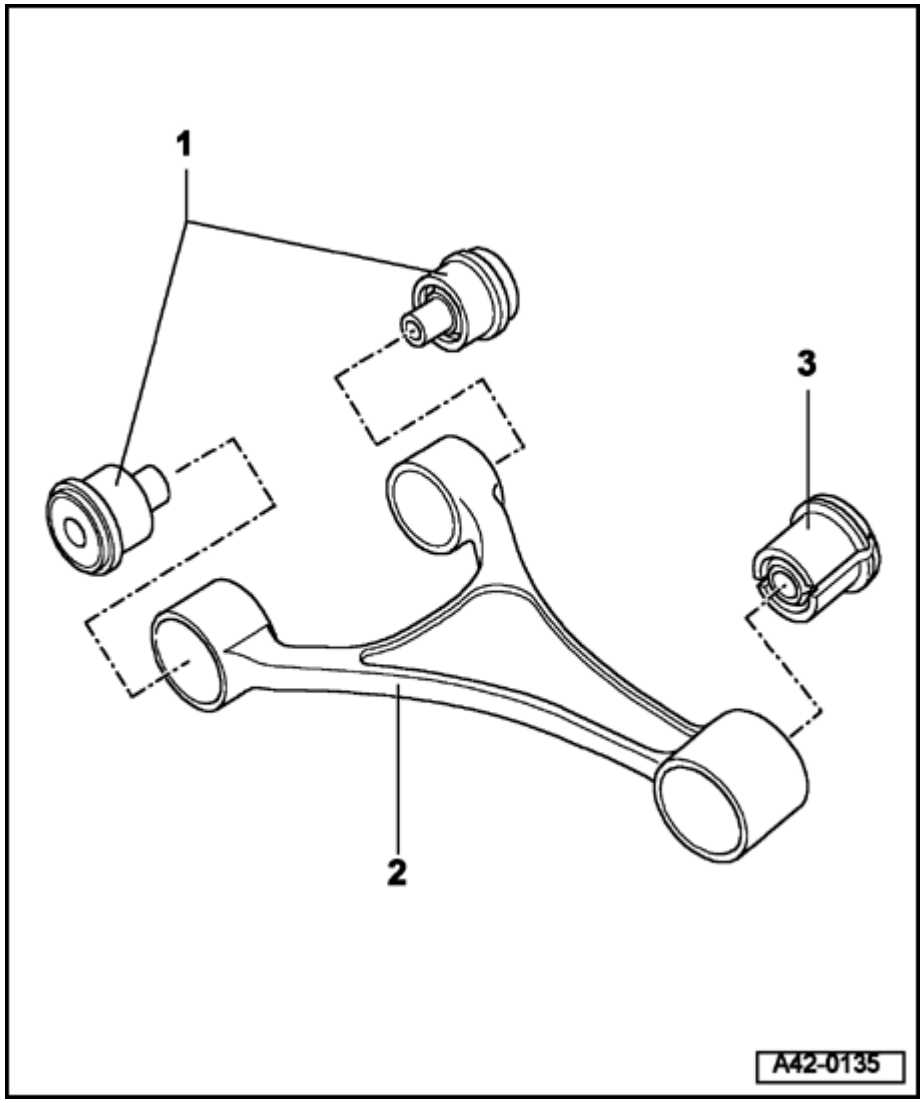
  Tightening torque: 70 Nm (52 ft lb) + 1/4-turn (90°)
- Remove suspension strut from VAG1752 suspension strut tensioner.

Note:

Illustration shows right-hand suspension strut.

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Upper control arm

Forged upper control arm, servicing

1 - Bonded rubber bushings

- Pressing out ⇒ Figs. 1 and ⇒ 2
- Pressing in ⇒ Fig. 4

2 - Upper control arm

- Replacement part has bonded rubber bushings installed
- Left and right-sides are identical

3 - Bonded rubber bushing

- Pressing out ⇒ Fig. 3
- Pressing in ⇒ Fig. 5
- Bushing can be installed with slit in outer cover in any installed position

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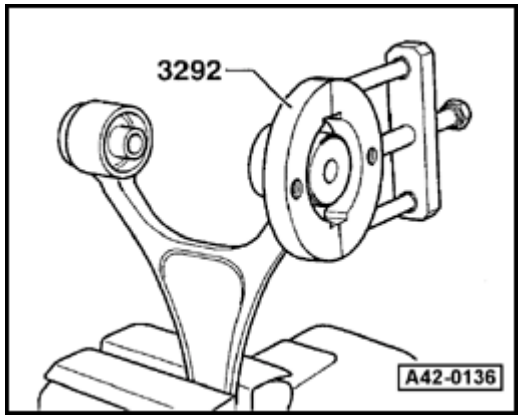


Fig. 1 Attaching assembly device to control arm

Be careful not to damage the surface of the control arm

- Attach 3292 assembly device with both sides of tool jaws between bearing and control arm.
- Screw in spindle up to stop so that tool compresses rubber metal bushing against eye in control arm eye.

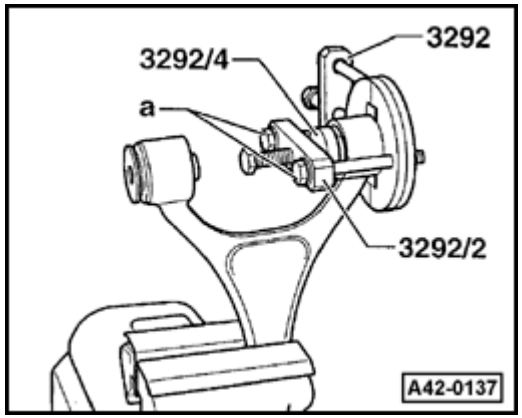


Fig. 2 Attaching pressure piece to control arm and pressing out bonded rubber bushing

- Secure 3292/2 to 3292 using bolts -a- (M10 x 80).
- Attach 3292/4
- Screw spindle into 3292 until bonded rubber bushing is pressed out.

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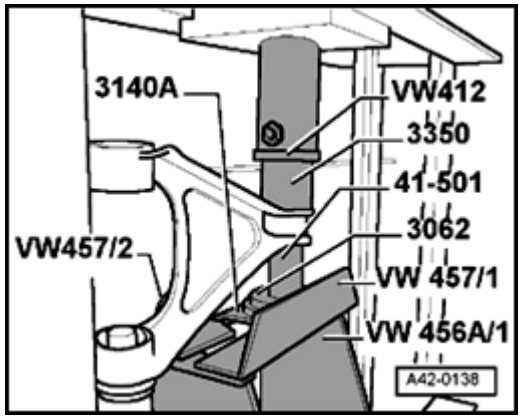


Fig. 3 Pressing bonded rubber bushing out from control arm

Note:

Make sure to install 41-501 lower pipe piece exactly correct.

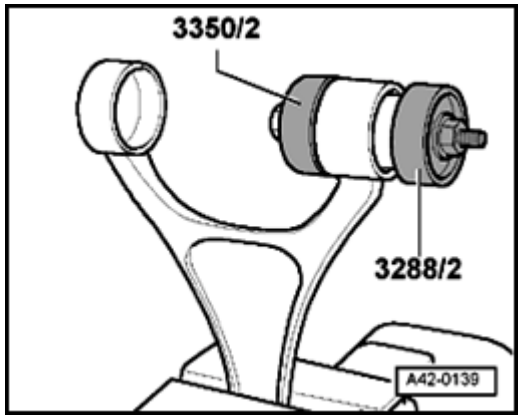


Fig. 4 Pressing bonded rubber bushing into control arm

- Install bonded rubber bushing at right angle to control arm.
- Install 3288/2 and 3350/2 pressure pieces as shown together with bolts and press in bushing up to stop in control arm eye.

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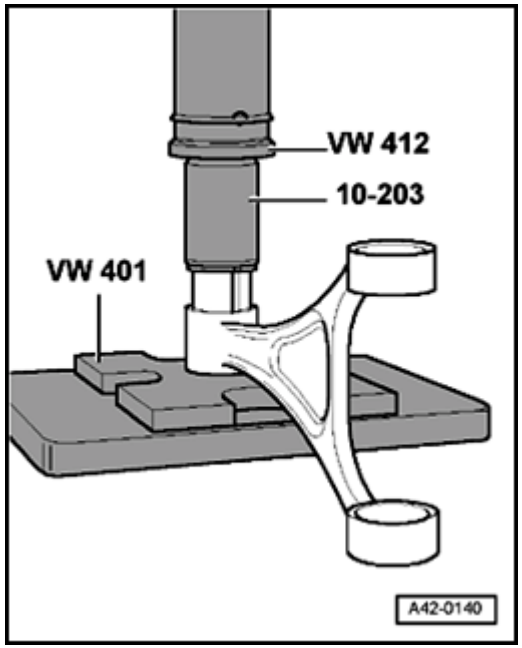
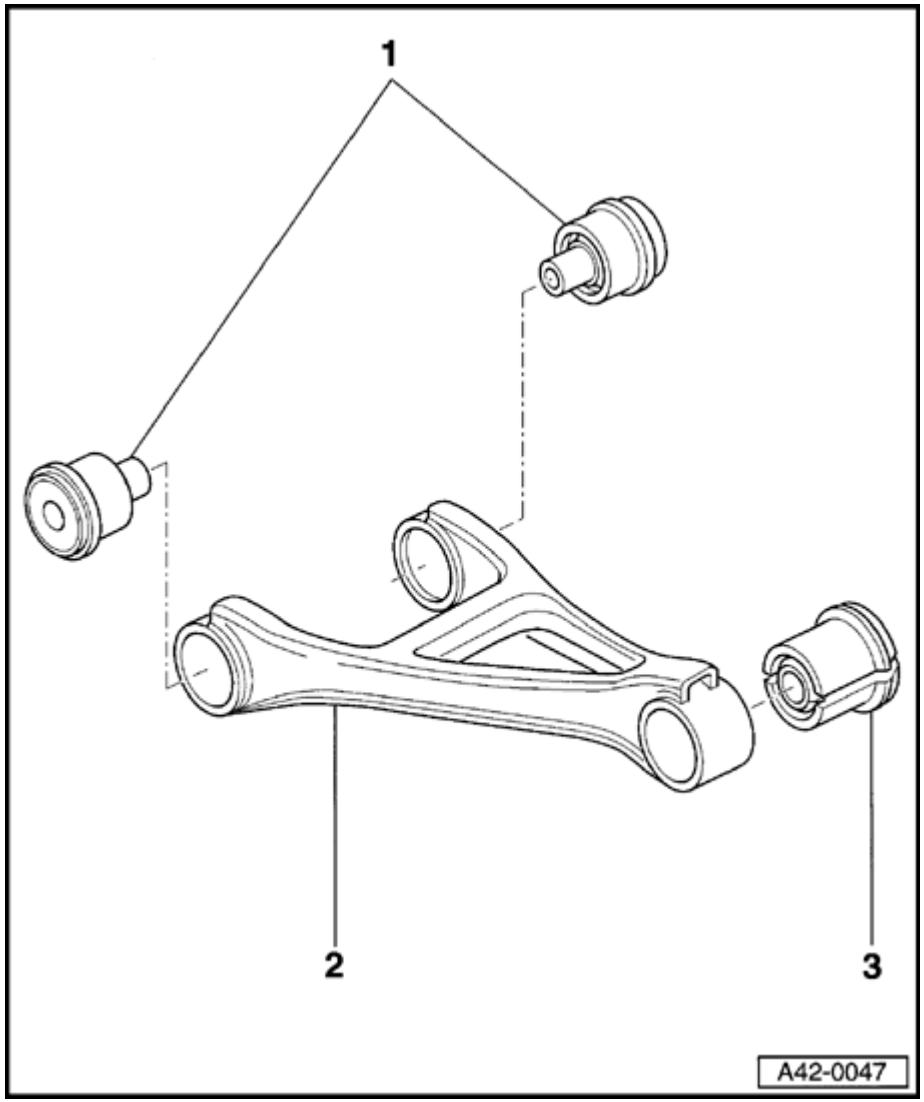


Fig. 5 Pressing bonded rubber bushing into control arm

- Press in bushing up to stop.

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Sheet steel upper control arm, servicing

1 - Bonded rubber bushings

- Pressing out ⇒ Fig. 1
- Pressing in ⇒ Fig. 3

2 - Upper control arm

- Replacement part supplied with bonded rubber bushings installed
- Left and right-side components are identical

3 - Bonded rubber bushing

- Pressing out ⇒ Fig. 2
- Pressing in ⇒ Fig. 4
- Bushing may be installed with slots in bushing aligned in any direction

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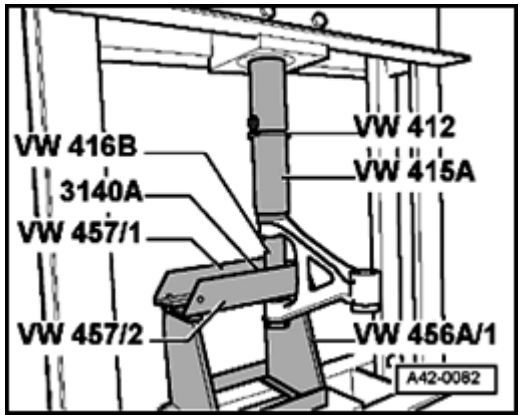


Fig. 1 Pressing bonded rubber bushings out of upper control arm

If VW416B tube, 37 mm dia. becomes canted while pressing out, relieve pressure and start over.

CAUTION!

Be careful not to damage the surface of the upper control arm.

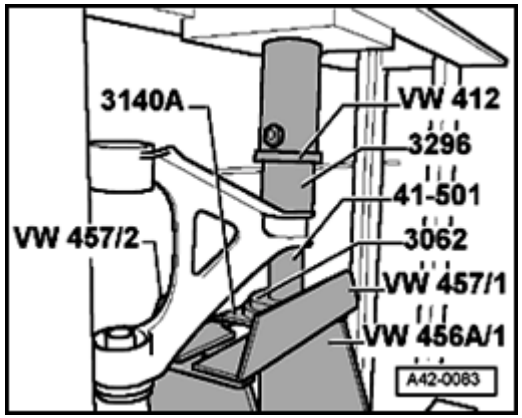


Fig. 2 Pressing bonded rubber bushing out of upper control arm

Note:

41-501 tubular section must be exactly in the correct position.

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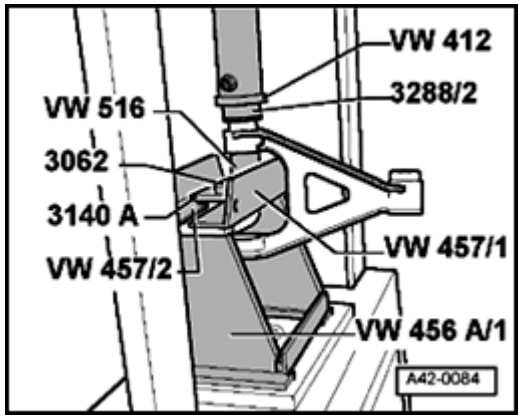


Fig. 3 Pressing bonded rubber bushings into upper control arm

- Position bonded rubber bushing perpendicular to upper control arm.
- Press bushing fully in up to stop.

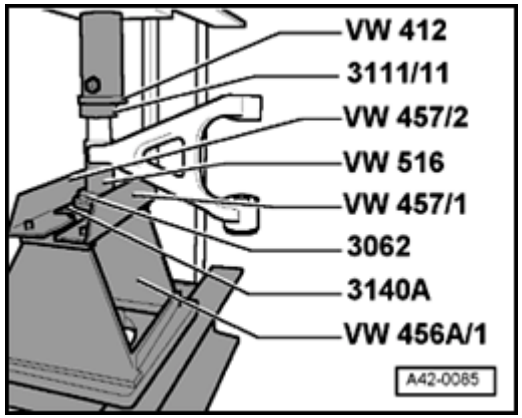


Fig. 4 Pressing bonded rubber bushing into upper control arm

- Press bushing fully in up to stop.

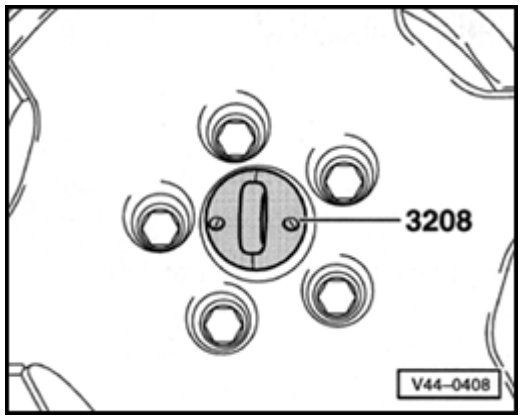
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Lower control arm, removing and installing

Removing

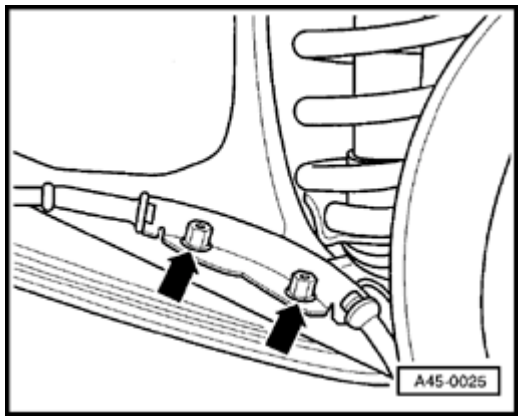
- Vehicle must be standing on its wheels above vehicle lift



- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap

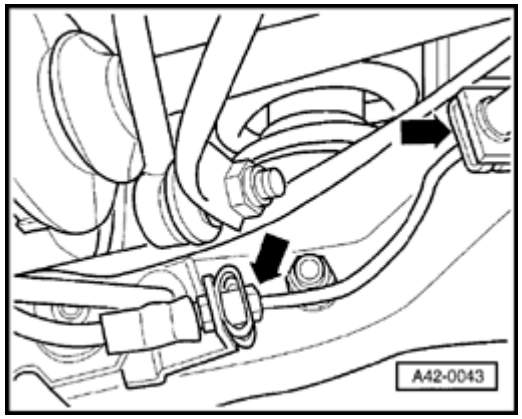
- Loosen wheel bolts.
- Raise vehicle on lift.
- Remove wheel.



- Remove bracket for ABS wheel speed sensor cable.
- Extract brake fluid from reservoir:

⇒ *Repair Manual, Brake System, Repair Group 47*

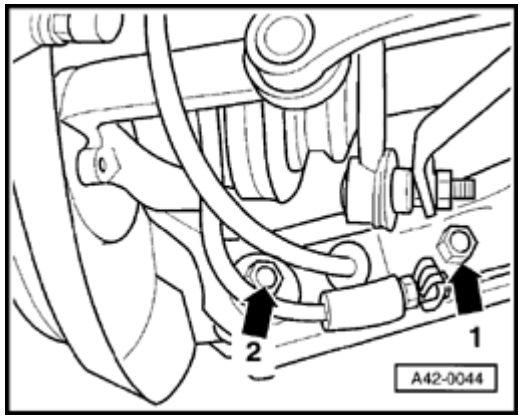
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- Disconnect brake line at points indicated.

Note:

On vehicles with headlight range control, the linkage for the headlight range control must be disconnected to remove the rear axle or lower control arm ⇒ page 42-48 .

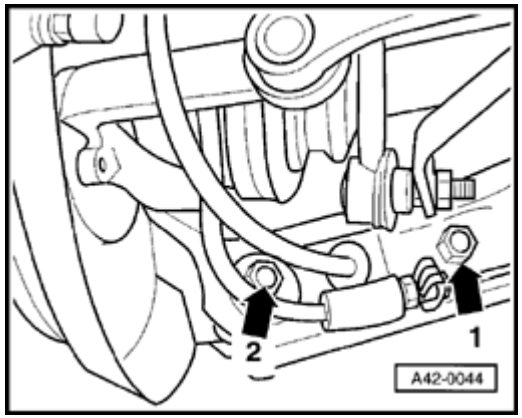


- Remove self-locking nut and bolt mounting lower control arm to suspension strut (arrow -1-) ⇒ page 42-40 .

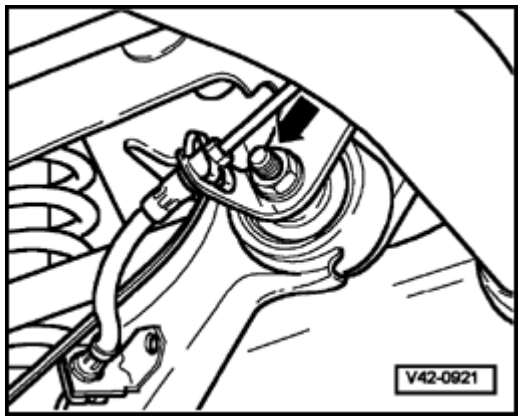
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- Remove parking brake cable:

⇒ *Repair Manual, Brake System, Repair Group 46*



- Remove eccentric bolt for wheel bearing housing to lower control arm (arrow -2-) ⇒ page 42-41 .



- Remove both mounting bolts for subframe to lower control arm (arrow) ⇒ page 42-40 .

Note:

Only one bolt is shown to simplify the illustration.

- Remove control arm.

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Installing

WARNING!

- ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

CAUTION!

Bonded rubber bushings can only be turned to a limited extent. The bolted connection between the wheel bearing housing to lower control arm and the connection between the shock absorber to lower control arm must only be tightened when the vehicle is standing on the ground. Otherwise the bonded rubber bushings will be subjected to a torsional stress resulting in shortened service life

- Install in reverse order of removal.

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- Always replace bolts and nuts.

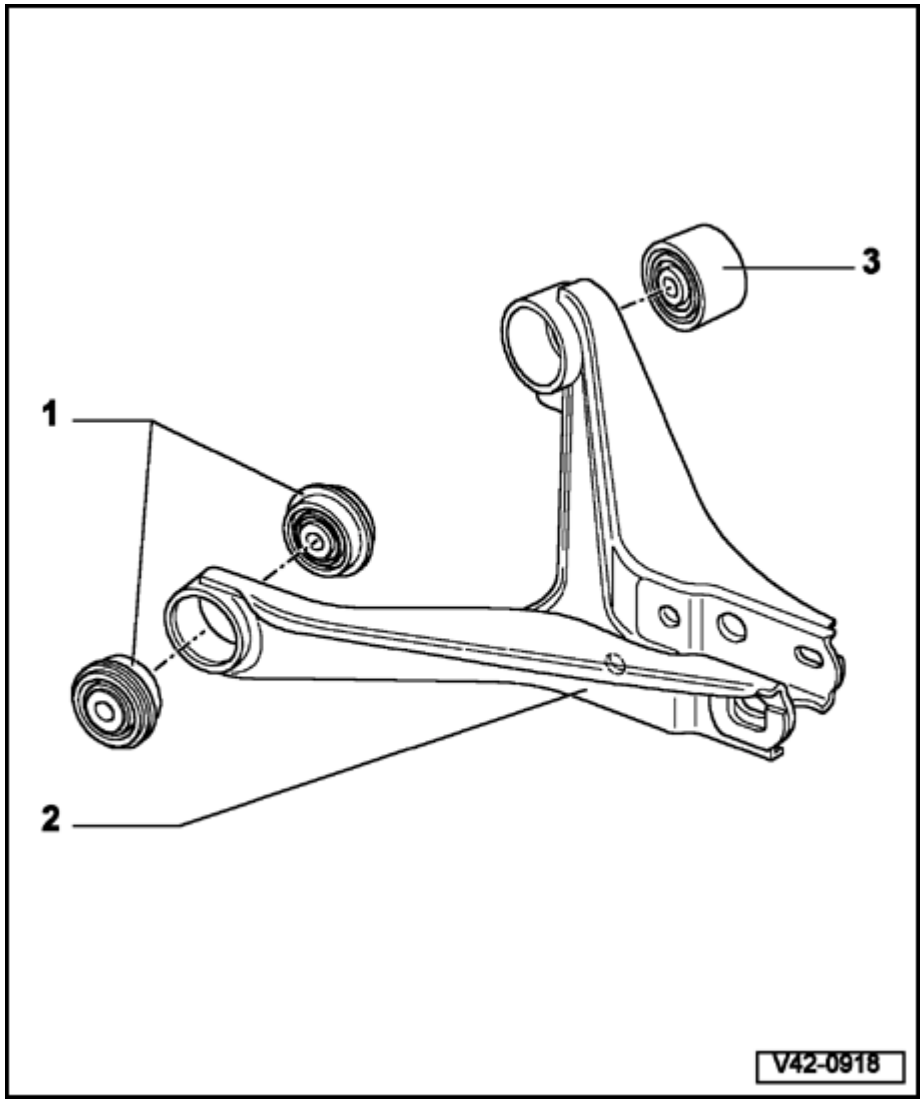
- Bleed brake system:

⇒ *Repair Manual, Brake System, Repair Group 47*

- Check wheel alignment and adjust if necessary ⇒ page 44-6 .

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42-89



Lower control arm, servicing

1 - Rear bonded rubber bushing

- Replacing ⇒ Figs. 1 and ⇒ 4
- Always replace both halves

2 - Lower control arm

- Replacement part supplied with bonded rubber bushings installed

3 - Front bonded rubber bushing

- Replacing ⇒ Fig. 5

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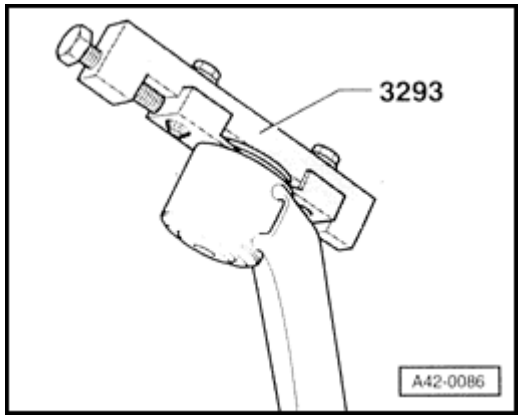


Fig. 1 Attaching 3293 lower control arm assembly device to lower control arm

Notes:

- *The two collars of the bonded rubber bushings must be flanged slightly before installing into lower control arm assembly device.*
- *Be careful when attaching lower control arm assembly device.*

- Attach 3293 lower control arm assembly device to bushing with jaws of tool positioned between lip of bushing and lower control arm.
- Screw in threaded stem to force bushing slightly from lower control arm.

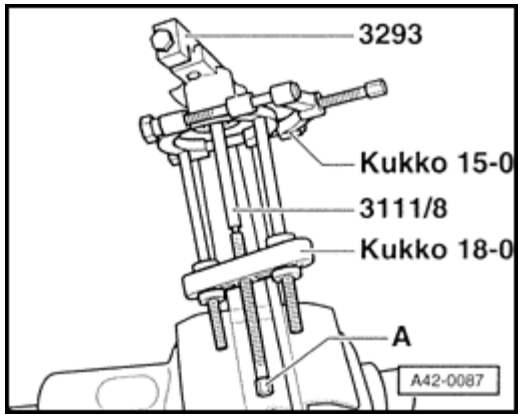


Fig. 2 Attaching puller into lower control arm

- Attach commercially available puller (e.g. Kukko 15-0) to lower control arm.
- Insert 3118/8 adapter into hole in bonded rubber bushing.
- Screw Kukko 18-0 into Kukko 15-0 and centrally align.
- Screw in threaded stem -A- until bonded rubber bushing is pulled out.

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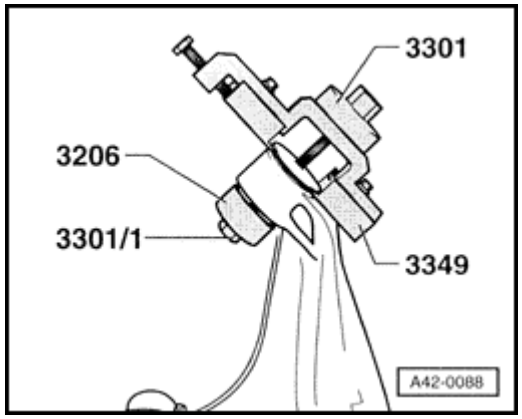


Fig. 3 Pulling second half of bonded rubber bushing into lower control arm

- Attach 3349 puller to lower control arm.
- Screw in threaded stem of 3301/1 until second half of bushing is fully removed.

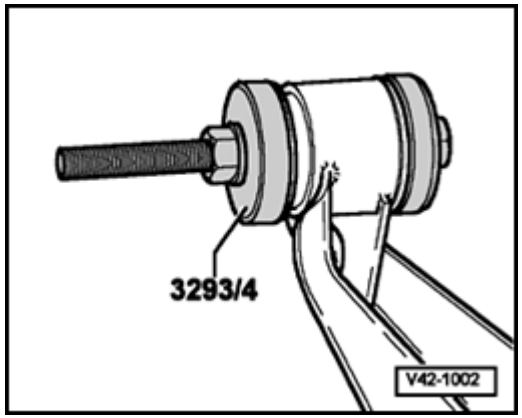


Fig. 4 Installing bonded rubber bushing into lower control arm

- Insert two halves of bonded rubber bushing together with 3293/4 thrust pieces and threaded stem into lower control arm art right angles.
- Turn threaded stem until bonded rubber bushing is pulled fully in up to stop.

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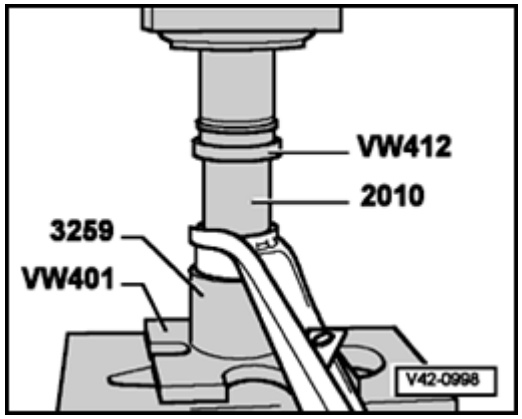


Fig. 5 Pressing bonded rubber bushing in and out of lower control arm

- Press bushing in until flush.

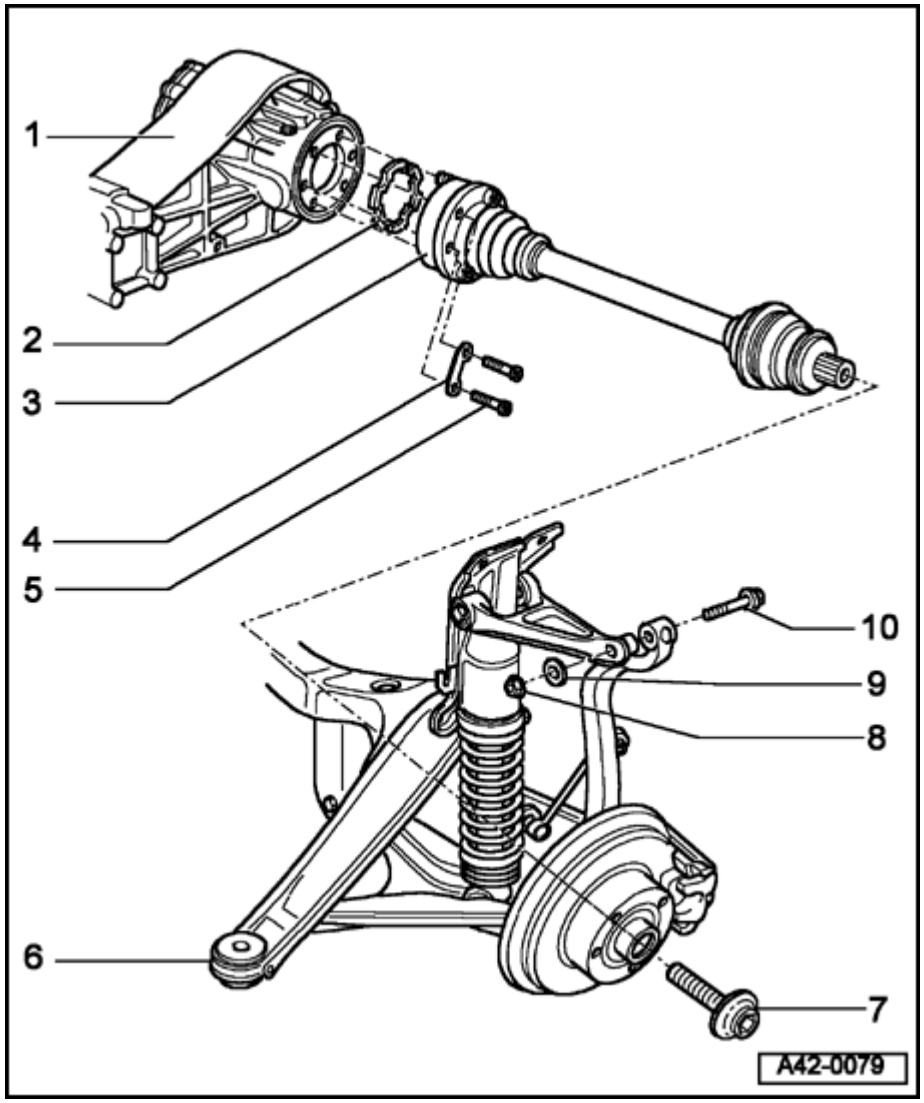
Note:

When pressing out, make sure that the bonded rubber bushing does not rest on the end face of 3259 tube.

- Collar of 3259 tube faces VW401 thrust plate

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Rear drive axle, removing and installing

1 - Rear final drive

2 - Gasket

- Always replace
- Remove protective backing and stick onto joint

3 - Drive axle

- Servicing ⇒ page 42-99

CAUTION!

Do not attempt to move a vehicle from which the drive axle has been removed. Otherwise wheel bearing damage will result. If the vehicle must be moved, install an outer CV joint in place of the drive axle.

4 - Spacer plate

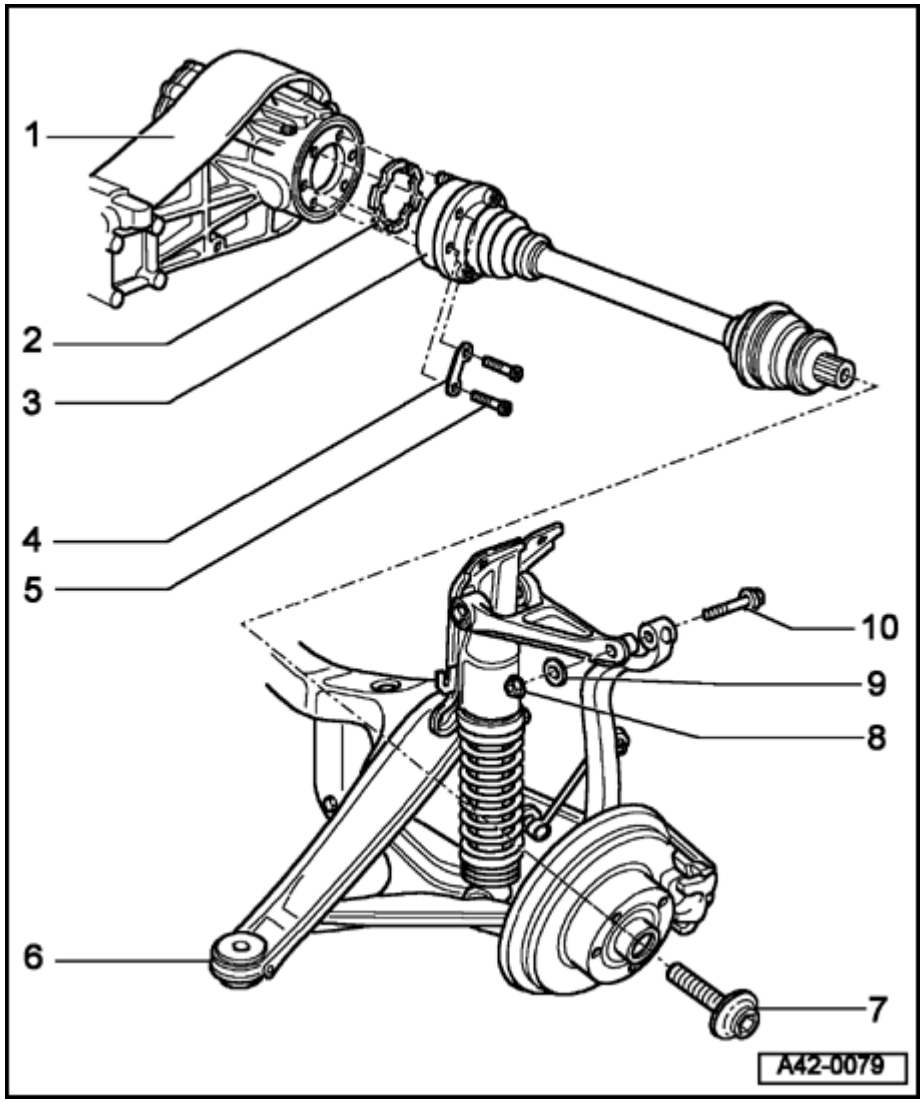
5 - Bolts

- 40 Nm (30 ft lb)

6 - Subframe

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42-94



7 - Collar bolt

- Always replace
- Switching from or mixing old and new bolts is permissible
- M14 bolt: 115 Nm (85 ft lb) + 1/2-turn (180 °)

WARNING!

The vehicle must be standing on its wheels when loosening or tightening. Otherwise the risk of an accident exists.

8 - Self-locking nut

- Always replace
- 70 Nm (52 ft lb) + 1/4-turn (90 °)

9 - Washer

- Always replace

10 - Bolt

- Always replace

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42-95

Removing and installing drive axle (left-hand side)

- Vehicle must be standing on its wheels above vehicle lift

- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap

- Loosen collar bolt.

WARNING!

The vehicle must be standing on its wheels when loosening or tightening the collar bolt for the drive axle. Otherwise the risk of an accident exists.

- Loosen wheel bolts.

- Raise vehicle on lift.

- Remove wheel.

- Pull ABS wheel speed sensor slightly out of wheel bearing housing.

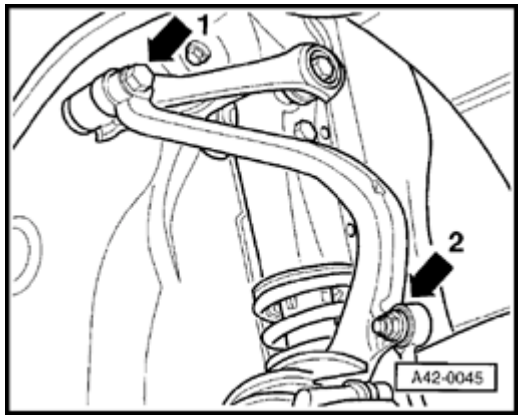
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- Remove collar bolt.

- Remove bolts from inner CV joint to rear final drive.

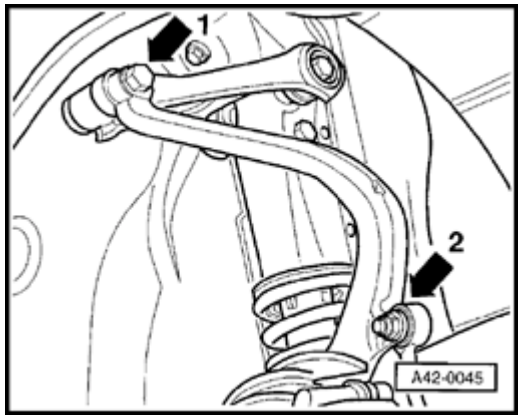
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- Remove nut and bolt for connecting link to wheel bearing housing (arrow -2-) ⇒ page 42-43 .

  Tightening torque: 50 Nm (37 ft lb)



- Remove bolted connection from upper control arm to wheel bearing housing (arrow -1-) ⇒ page 42-94 .
- Remove exhaust system, rear silencer and center silencer:

Repair Manual, Engine Mechanical, Repair Group 26

- Lower drive axle on inside at rear final drive and remove from wheel bearing housing.

Installation is the reverse of removal.

CAUTION!

Bonded rubber bushings can only be turned to a limited extent. The bolted connection must only be tightened when the vehicle is standing on the ground. Otherwise the bonded rubber bushings will be subjected to a torsional stress resulting in shortened service life

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42-97

Removing and installing drive axle (right-hand side)

- Vehicle must be standing on its wheels above vehicle lift

- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap

- Loosen collar bolt.

WARNING!

The vehicle must be standing on its wheels when loosening or tightening the collar bolt for the drive axle. Otherwise the risk of an accident exists.

- Loosen wheel bolts.

- Raise vehicle on lift.

- Remove wheel.

- Pull ABS wheel speed sensor slightly out of wheel bearing housing.

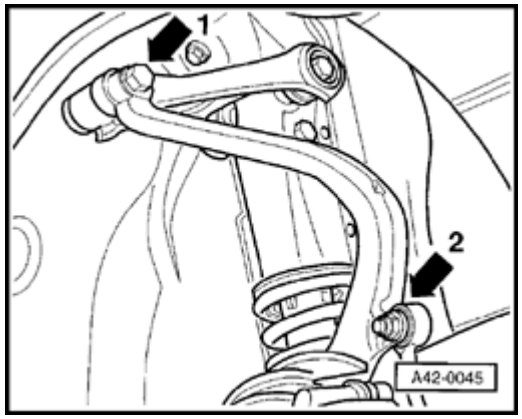
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- Remove collar bolt.

- Remove bolts from inner CV joint to rear final drive.

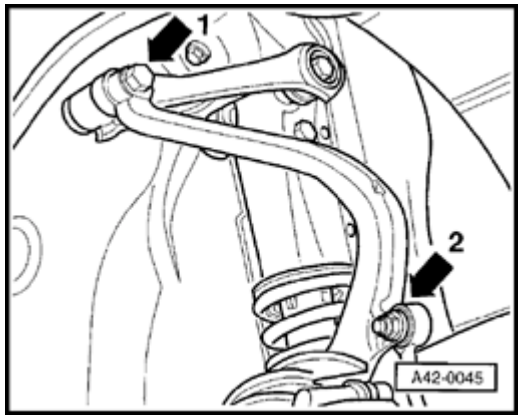
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42-98



- Remove nut and bolt for connecting link to wheel bearing housing (arrow -2-) ⇒ page 42-43 .

  Tightening torque: 50 Nm (37 ft lb)



- Remove bolted connection of upper control arm to wheel bearing housing (arrow -1-) ⇒ page 42-94 .
- Lower drive axle on inside at rear final drive and remove from wheel bearing housing.

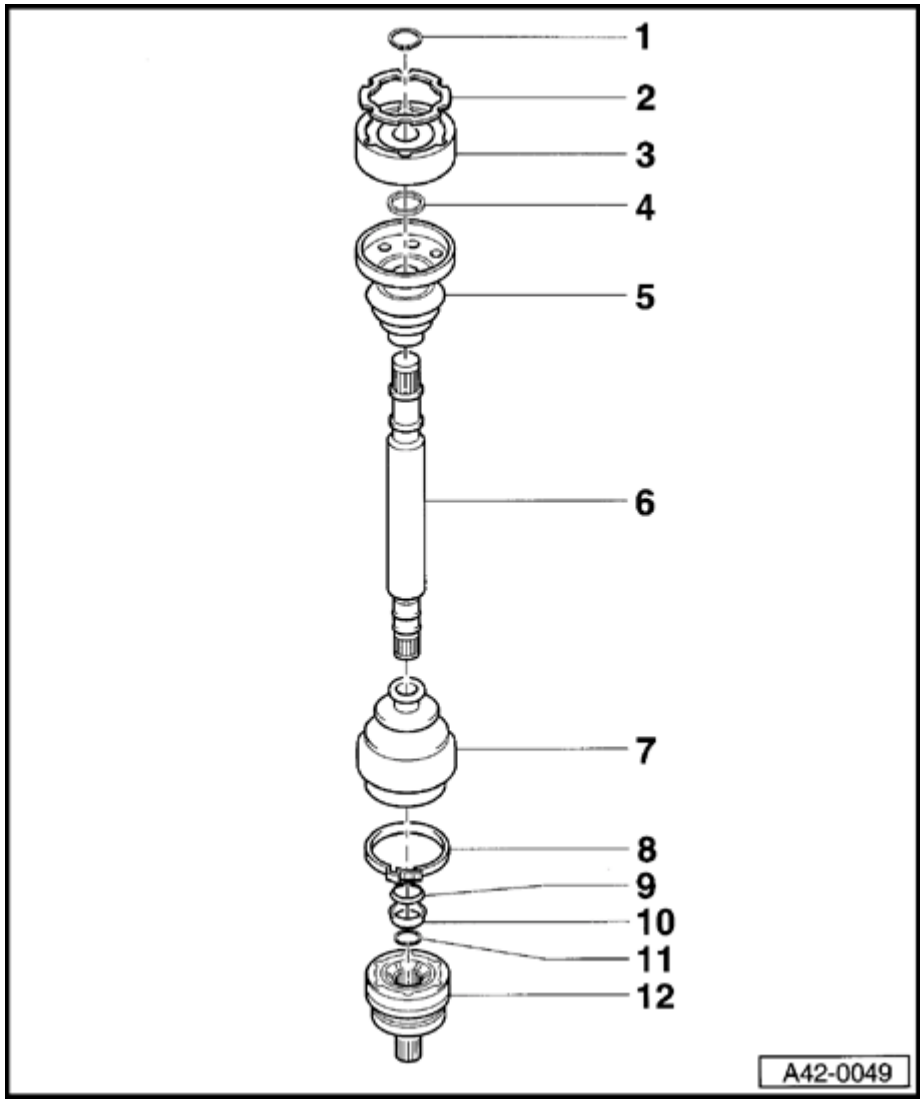
Installation is the reverse of removal.

CAUTION!

Bonded rubber bushings can only be turned to a limited extent. The bolted connection must only be tightened when the vehicle is standing on the ground. Otherwise the bonded rubber bushings will be subjected to a torsional stress resulting in shortened service life

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42-99



Rear drive axle, servicing

Note:

Constant Velocity (CV) joints are packed with grease G-6.

Outer joint dia.	Total grease required	Proportions:	
		Joint	Boot
89 mm (3.5 in.)	90 g (3.2 oz.)	40 g (1.4 oz)	50 g (1.8 oz)
Inner			
100 mm (3.9 in.)	80 g (2.8 oz.)	30 g (1.1 oz)	50 g (1.8 oz)

Note:

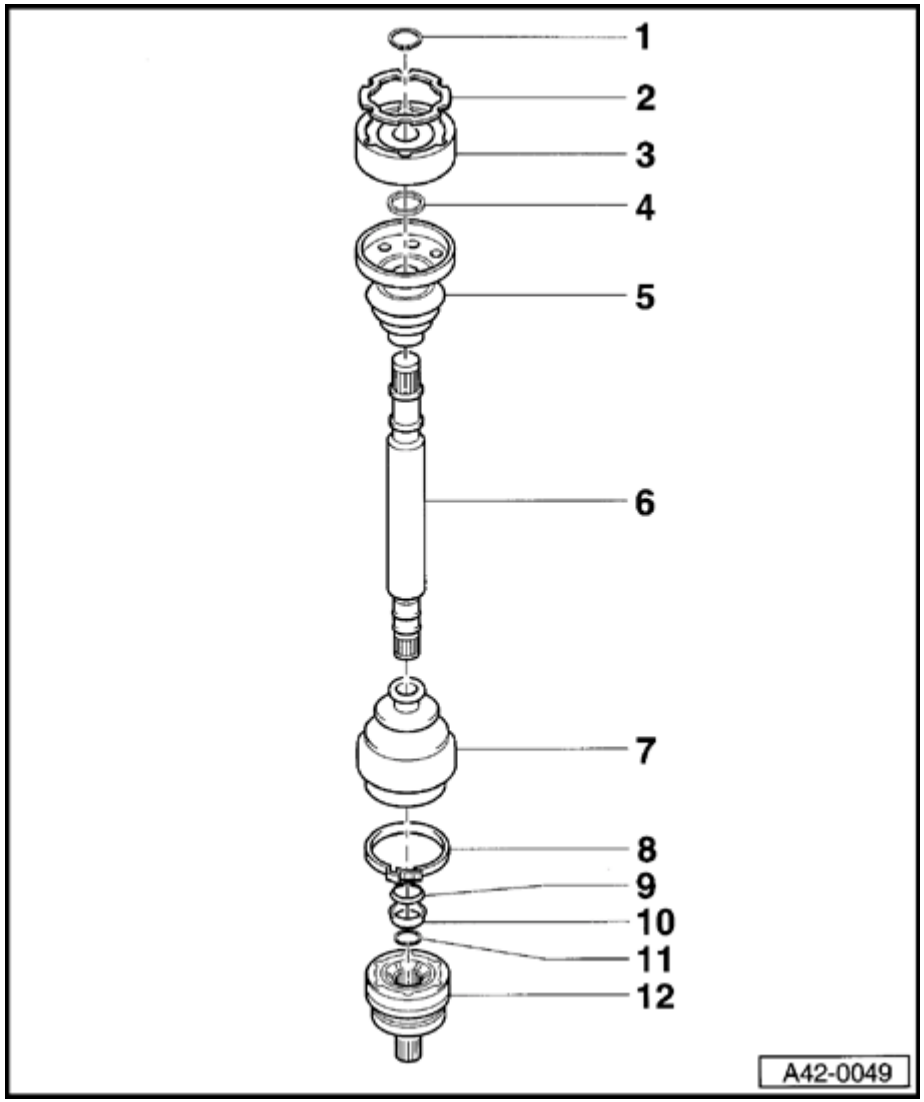
Re-grease the joint, if necessary, when replacing the CV joint boot.

1 - Circlip

- Always replace
- Use VW161a circlip pliers to remove and install ⇒ Fig. 5

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42-100



2 - Gasket

- Always replace; remove protective backing and stick onto joint

3 - Inner CV joint

- O.D.: 100 mm (3.9 in.)
- Replace only as complete joint
- Removing ⇒ Fig. 3
- Pressing on ⇒ Fig. 4
- Greasing ⇒ Note, page 42-99

4 - Dished washer

- Installation position ⇒ Fig. 7

5 - Inner CV joint boot with cap

- Examine for splits and signs of chafing
- Use drift to remove
- Coat sealing surface of CV joint with D-3 before attaching to CV joint

6 - Axle shaft

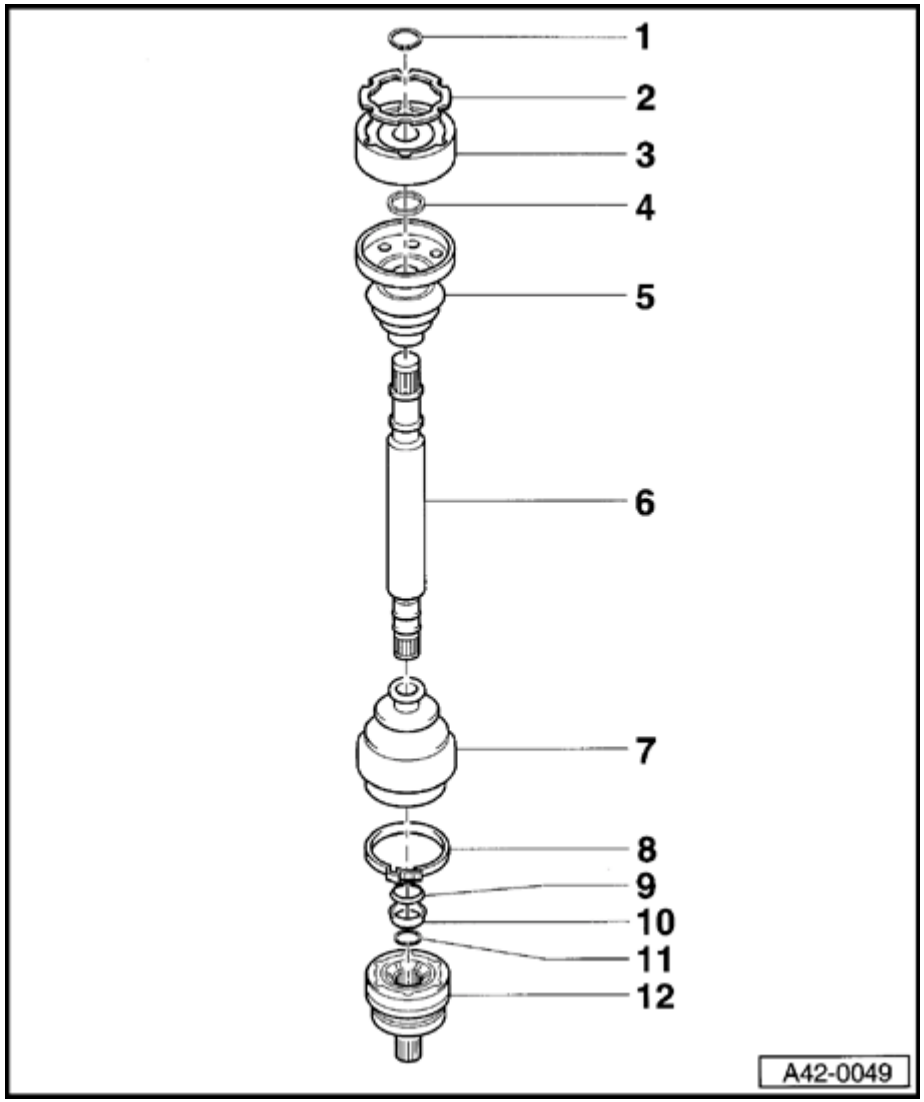
- Identical length on left and right-sides

7 - Outer CV joint boot

- Examine for splits and signs of chafing
- Ventilate before tightening clamp ⇒ Fig. 2

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42-101



8 - Clamp

- Always replace
- Tightening ⇒ Fig. 1

9 - Dished washer

- Larger diameter (concave side) contacts thrust ring
- Installation position ⇒ Fig. 6

10 - Spacer ring

- Installation position ⇒ Fig. 6

11 - Circlip

- Always replace
- Insert into annular groove of shaft when installing; not visible when joint installed

12 - Outer CV joint

- O.D.: 89 mm (3.5 in.)
- Replace only complete joint
- Removing ⇒ Fig. 8
- Installing: drive joint onto shaft using plastic-headed hammer until circlip engages in groove
- Greasing ⇒ Note, page 42-99

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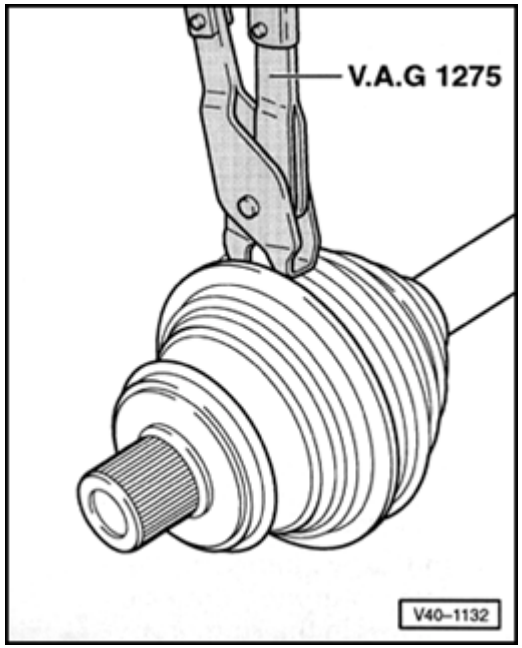


Fig. 1 Tightening clamp

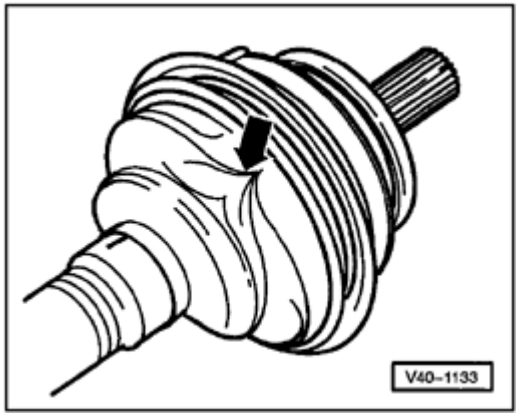


Fig. 2 Venting CV joint boot

Attaching the CV joint boot onto the outer body of the joint frequently requires compressing or squeezing the boot. This produces a vacuum in the joint boot, which may cause a crease to the inside when driving (arrow).

For this reason, after installing the joint boot, vent it briefly by letting some air in at the small diameter to balance the pressure and restore the correct boot shape.

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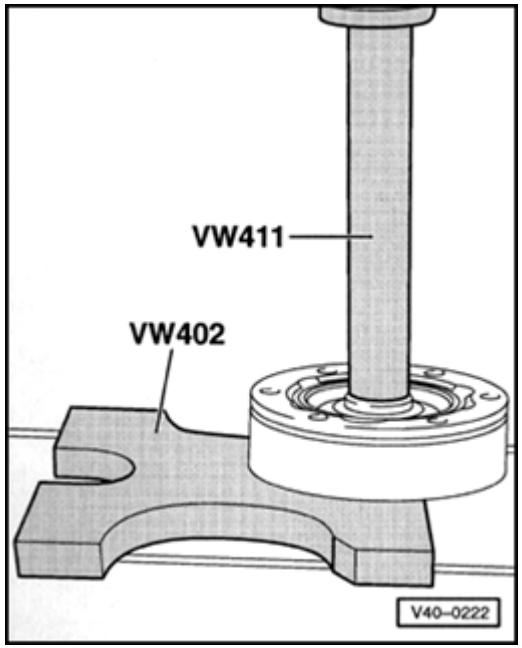


Fig. 3 Removing inner CV joint

Notes:

- *Use arbor to drive off boot first.*
- *Support ball hub.*

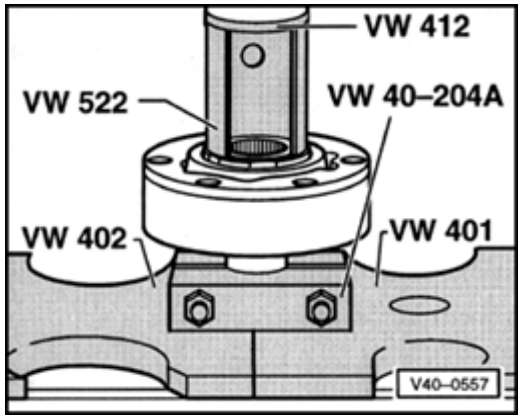


Fig. 4 Pressing on inner CV joint

Note:

Chamfer on the inner diameter of the ball hub (splines) must be facing toward the shoulder of the drive axle.

- Press joint on up to stop.
- Install circlip.

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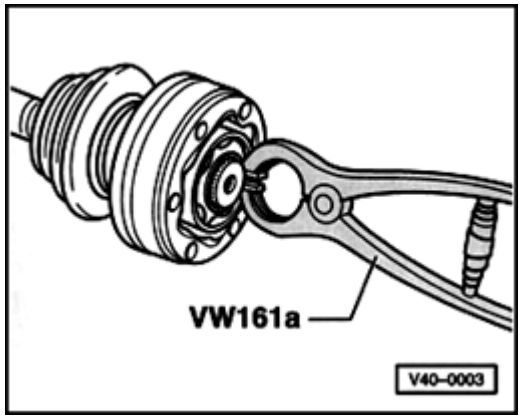


Fig. 5 Removing and installing circlip

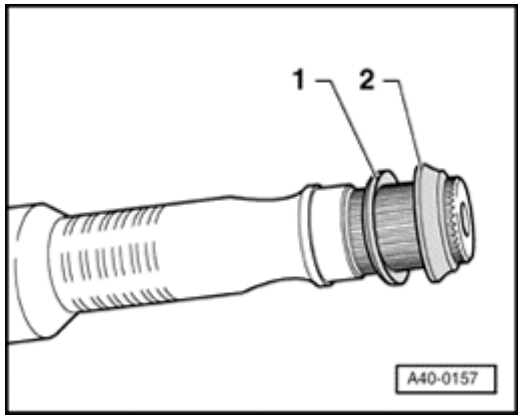


Fig. 6 Installation position of dished washer and spacer ring

1 - Dished washer

2 - Spacer ring (plastic)

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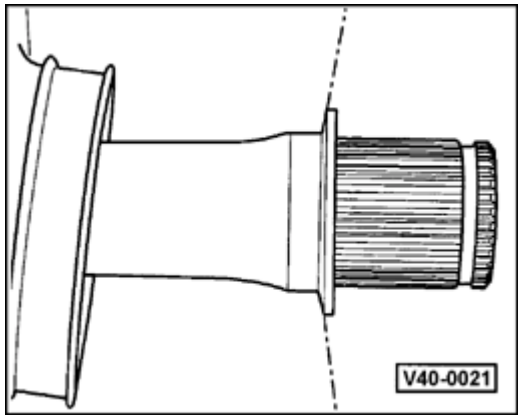


Fig. 7 Installing dished washer in correct position

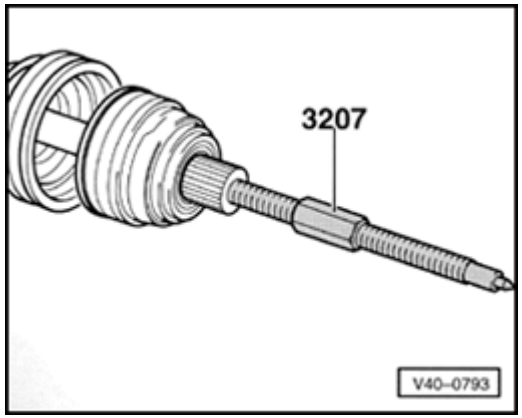


Fig. 8 Pressing off outer CV joint

- Clamp drive axle in vise using protective jaws.
- Remove clamp and push back boot.
- Screw in 3207 pressure spindle with M14-thread end into joint until CV joint is pressed off splined shaft.

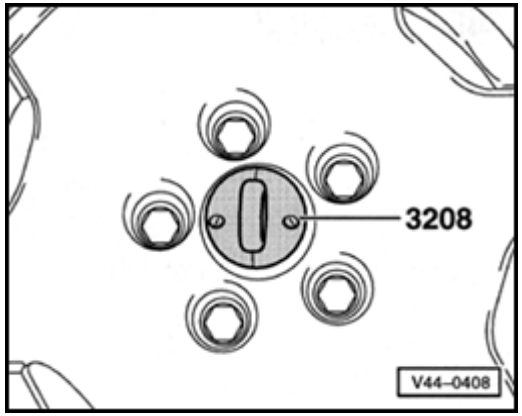
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Wheel bearing housing, removing and installing

Removing

- Vehicle must be standing on its wheels above vehicle lift



- Remove wheel trim.

  On light alloy wheels use puller in vehicle tool kit to remove trim cap

- Loosen collar bolt ⇒ page 42-94 , item - 7 -.

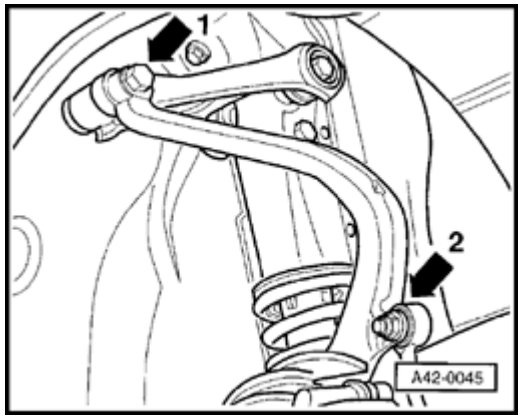
WARNING!

The vehicle must be standing on its wheels when loosening or tightening the collar bolt for the drive axle. Otherwise the risk of an accident exists.

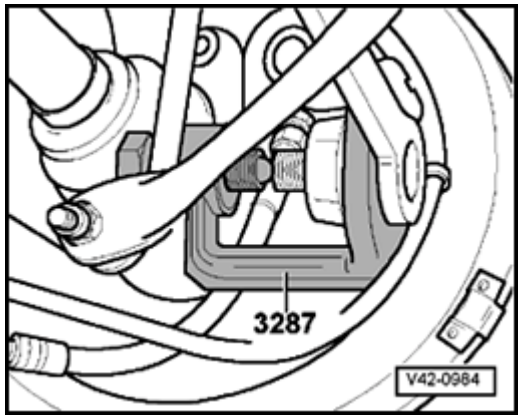
- Loosen wheel bolts.
- Raise vehicle on lift.
- Remove wheel.
- Pull ABS wheel speed sensor from wheel bearing housing.
- Remove collar bolt ⇒ page 42-94 , item - 7 -.

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- Remove bolt for connecting link to wheel bearing housing (arrow -2-).
- Remove track rod from wheel bearing housing ⇒ page 42-43 .



- Using 3287 ejection device for steering rod, press track rod off wheel bearing housing.

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- Remove bolts mounting brake caliper to wheel bearing housing.

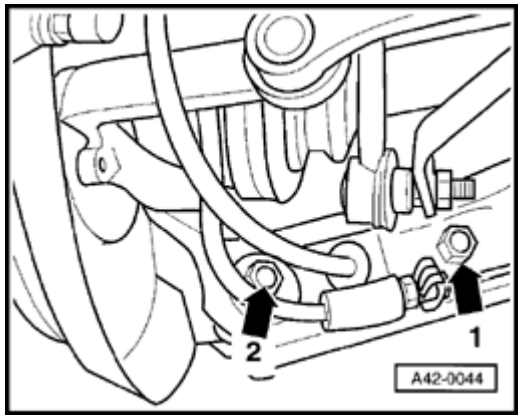
- Remove brake caliper and hang from body.

CAUTION!

- ***Do not allow caliper to hang by brake hose. The unsupported weight can stretch and damage the hose***

- ***Do not loosen brake hose or lines.***

- Remove brake disc.



- Mark installation position of eccentric washer for bolt (arrow -2-) for wheel bearing housing to lower control arm (⇒ page 42-41) and remove.



- Remove wheel bearing housing to upper control arm bolt (arrow -1-).

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- Remove wheel bearing housing from drive axle and remove.

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Installing

- Install in reverse order of removal.

CAUTION!

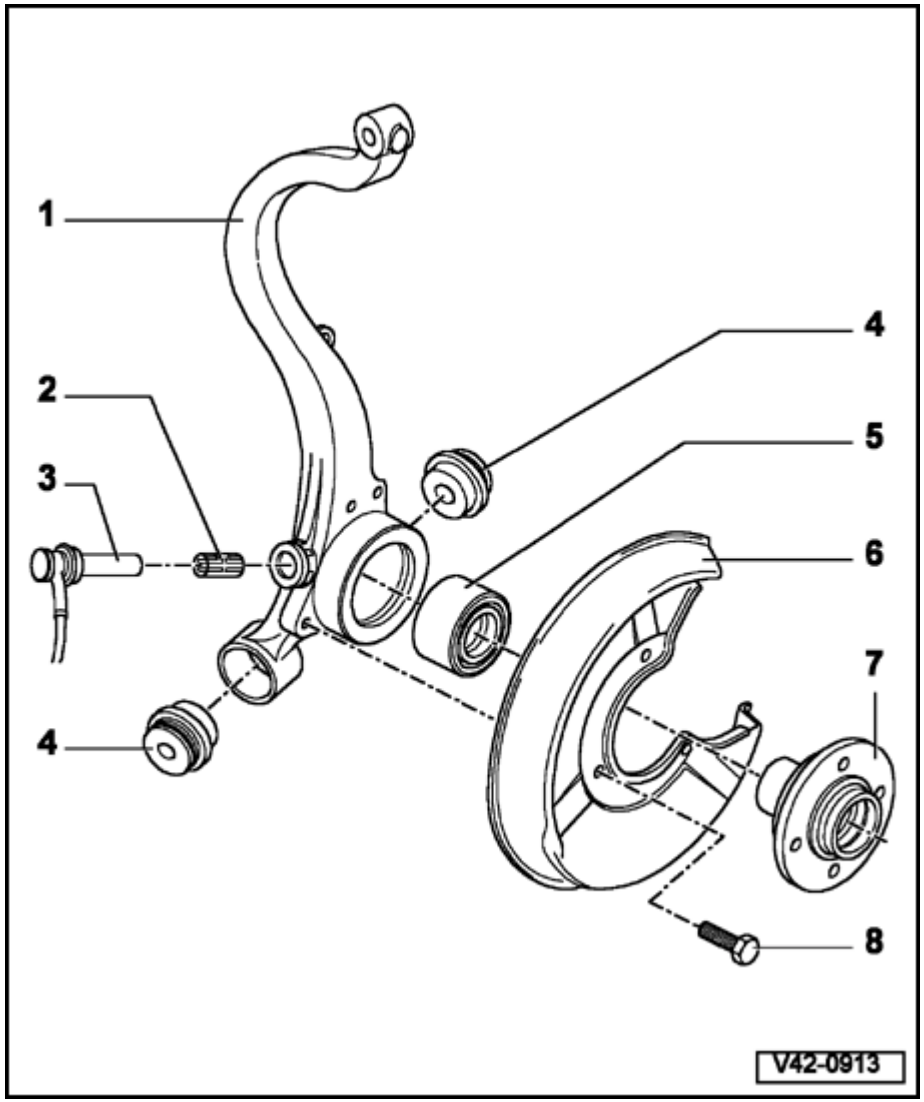
- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

- ***Bonded rubber bushings can only be turned to a limited extent. The bolted connection between the wheel bearing housing and the upper control arm must only be tightened when the vehicle is standing on the ground. Otherwise the bonded rubber bushings will be subjected to a torsional stress resulting in shortened service life***

- Check wheel alignment and adjust if necessary ⇒ page 44-6 .

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Wheel bearing housing, servicing

1 - Wheel bearing housing

- Do not grease bearing seat in wheel bearing housing before pressing in wheel bearing
- After replacing, check and if necessary adjust wheel alignment

2 - Clamping sleeve

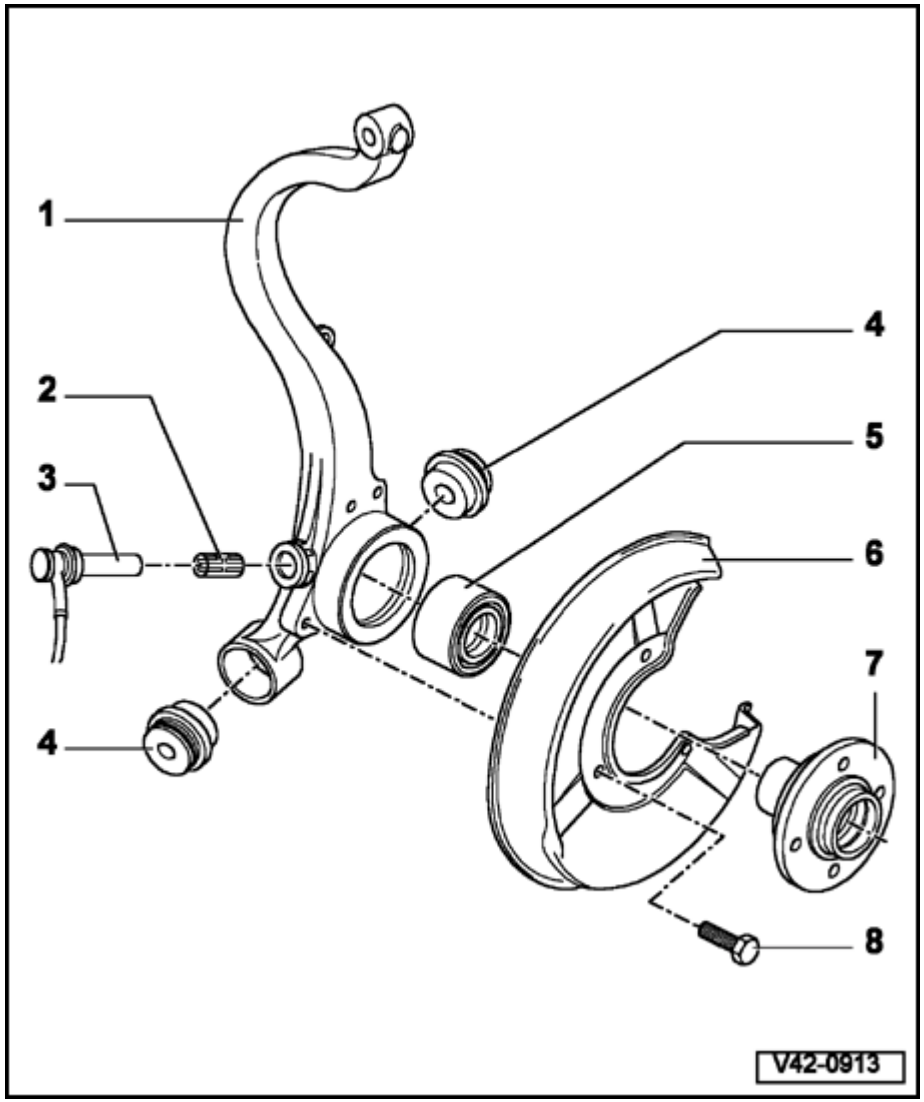
- Always replace
- Left and right-sides identical
- Grease all around with brake cylinder paste before inserting into wheel bearing housing
- Press into wheel bearing housing until fully seated

3 - ABS wheel speed sensor

- To remove, pull out
- Do not install until drive axle has been installed
- To install, press in by hand until fully seated

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4 - Bonded rubber bushing

- Replacing ⇒ Figs. 1 , ⇒ 2 and ⇒ 3
- Always replace both bushing halves

5 - Wheel bearing

- Stepped design
- Installation position: larger inner diameter of wheel bearing faces wheel hub - 7 -
- Removing ⇒ Fig. 4
- Installing ⇒ Fig. 5

6 - Splash shield

- Bolt to wheel bearing housing

7 - Wheel hub

- Removing ⇒ Fig. 6
- Installing ⇒ Fig. 7
- Pressing off bearing inner race ⇒ Figs. 8 and ⇒ 9

8 - Bolt

- 10 Nm (7 ft lb)

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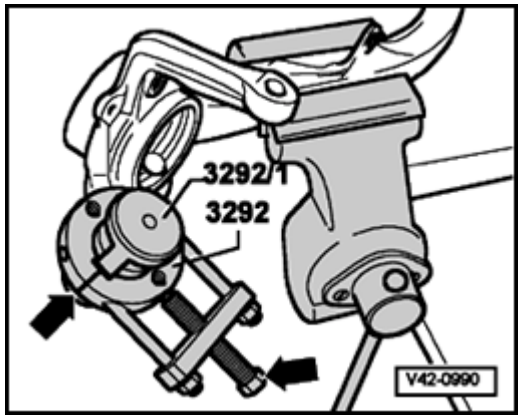


Fig. 1 Inserting assembly device into wheel bearing housing

- Position 3292/1 support onto bonded rubber bushing.
- Push 3292 assembly device over 3292/1 support and move into position.
- Tighten threaded spindle up to stop so that both jaws of 3292 assembly device are located in annular groove between bonded rubber bushing and wheel bearing housing.

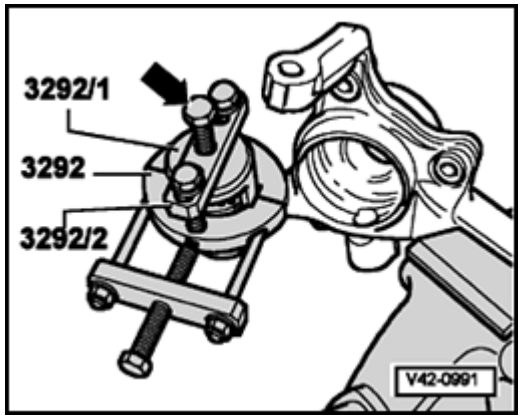


Fig. 2 Bolting cross bar onto assembly device

- Center 3292/2 cross bar and move fully up against 3292/1 support by tightening both bolts.
- Screw in spindle of 3292/2 cross bar until bushing is drawn out.

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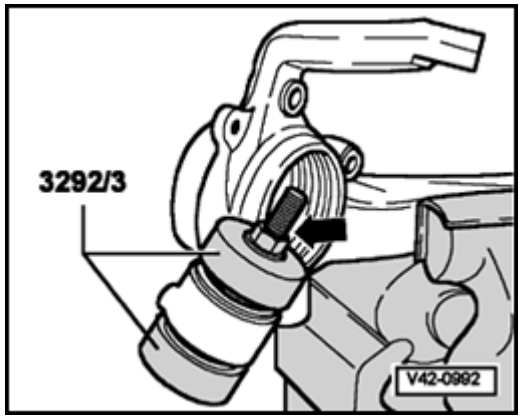


Fig. 3 Installing bonded rubber bushing

- Install bonded rubber bushing on both sides and perpendicular to hole in wheel bearing housing.
- Position one 3293/3 thrust piece each onto two bushings and use threaded spindle to draw in bushing up to stop.

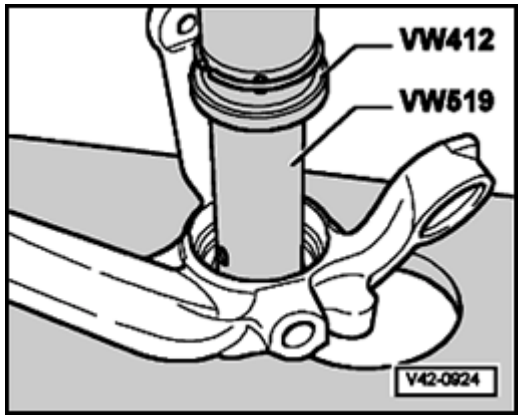


Fig. 4 Removing wheel bearing from wheel bearing housing

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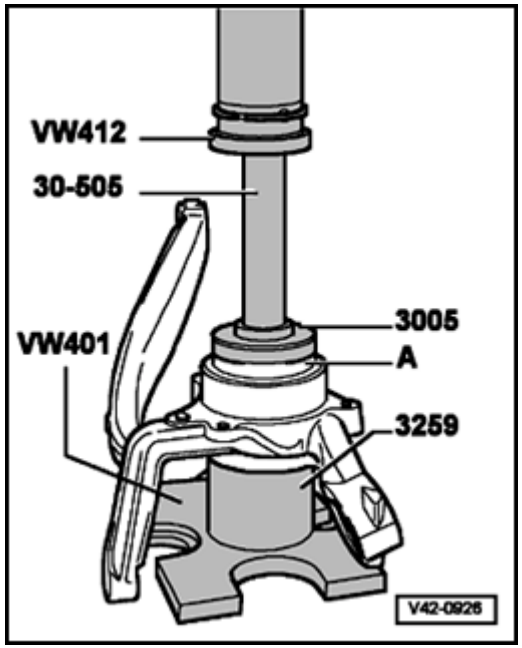


Fig. 5 Installing wheel bearing

- If necessary, remove any corrosion/dirt from hole in wheel bearing housing.
- Press in bearing -A- until fully seated.

  Larger inner diameter of wheel bearing faces wheel hub

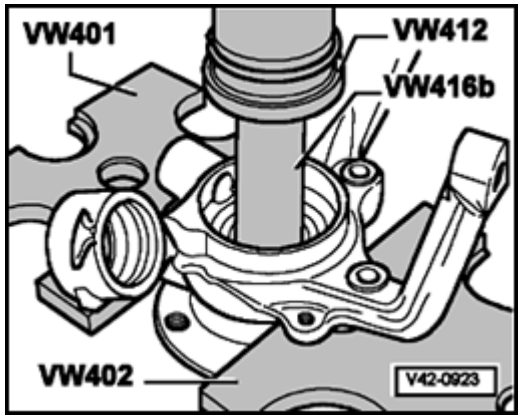


Fig. 6 Removing wheel hub from wheel bearing housing

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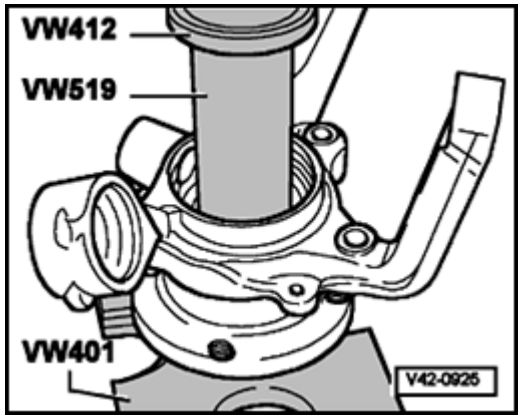


Fig. 7 Installing wheel hub

CAUTION!

VW519 sleeve must only contact the bearing inner race when pressing in the wheel hub.

- Press fully home.

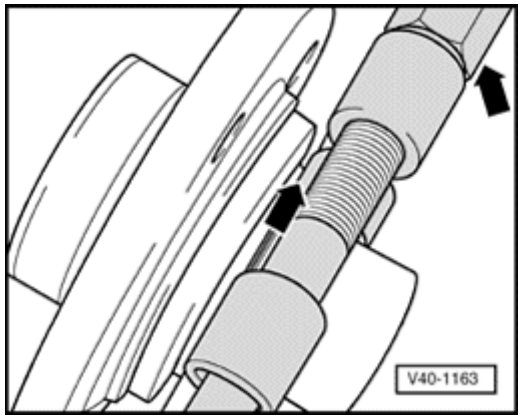


Fig. 8 Installing separating device

- Install separating device into annular groove of bearing inner race and preload with spindle.

Note:

Use commercially available separating device, e.g. KUKKO 15-17.

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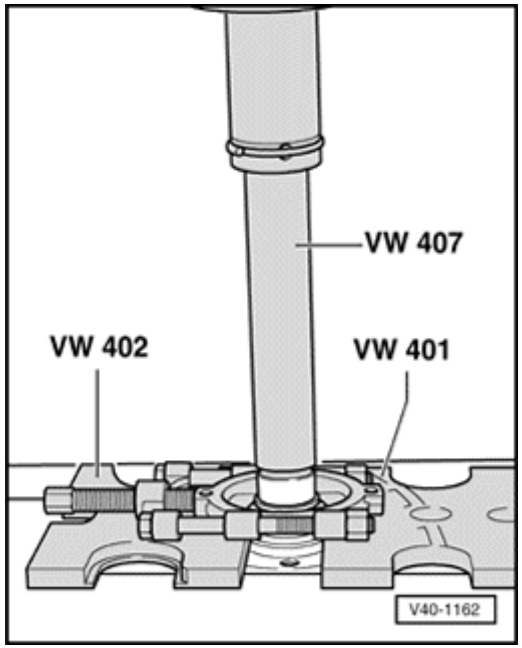


Fig. 9 Pressing bearing inner race off wheel hub

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Wheel bearing housing, servicing using VAG1459B

Instead of using the VAG1290 workshop press, the VAG1459B hydraulic wheel bearing and wheel hub removal and installation tool together with the VAG1459B/2 accessory can instead be used to service the wheel bearing housing.

Advantages:

- Wheel bearing housing does not need to be completely disassembled
- Track rod and lower control arm remain in position at wheel bearing housing; therefore wheel alignment does not need to be checked

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Wheels and tires

WARNING!

- ***Do not re-use any fasteners that are worn or deformed in normal use.***
- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

Notes:

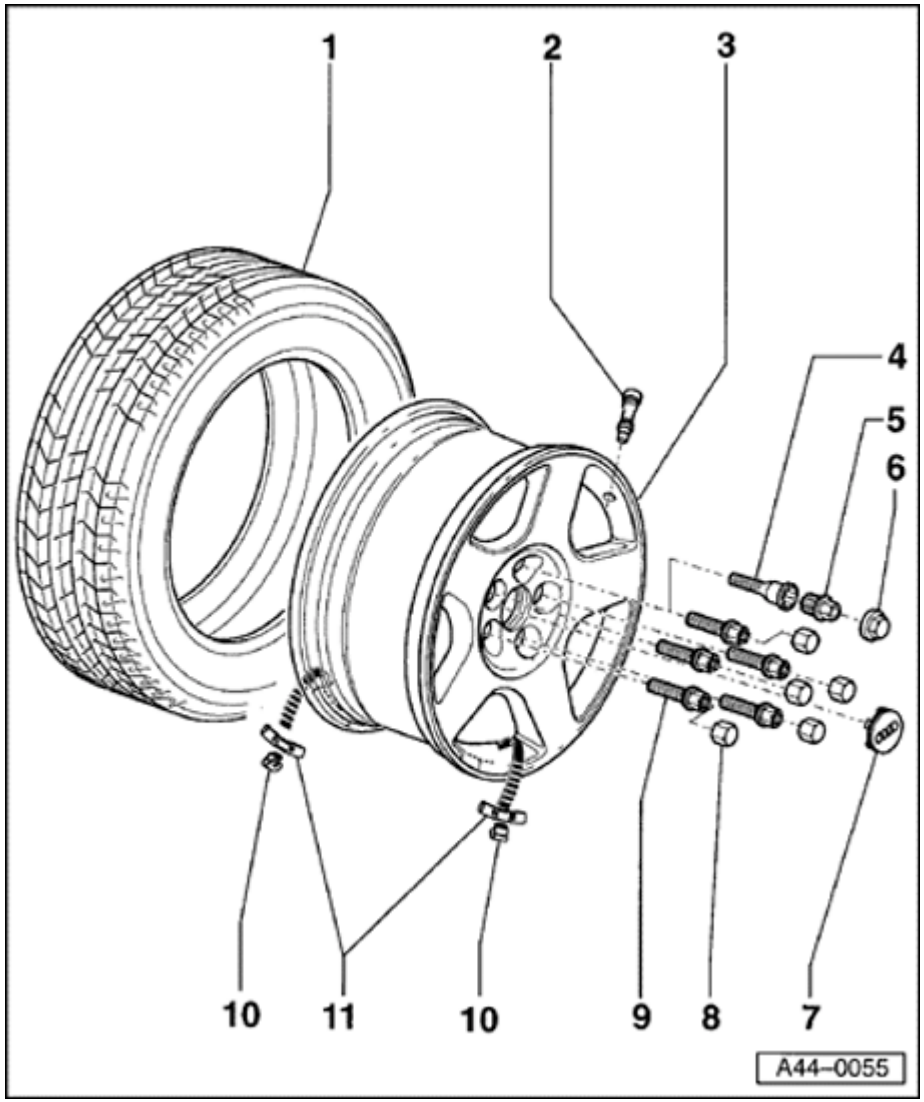
- *The approved wheel/tire combinations had not been finalized at the time of printing of this Repair Manual.*
- *For safety reasons, the tires should be replaced in pairs for one axle at a time or for both axles together; not individually.*
- *Always install tires with the deepest tread on the front axle.*

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- *It is recommended to use tires of the same make, design and tread pattern on all four wheels.*
- *Install a new valve stem when installing a new wheel or tire.*
- *If using tires with a directional tread pattern, the spare tire should be mounted on the wheel with the tread pattern facing the same way as the tires on the right-side of the vehicle.*

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Light-alloy wheel

1 - Tire

2 - Valve

- Always replace
- Use only correct valves as specified in parts catalog microfiche

3 - Wheel

- Bolt hole circle diameter: 112 mm (4.409 in.)

4 - Anti-theft wheel bolt M14 x 1.5 x 27.5

- 120 Nm (89 ft lb)

5 - Adapter for anti-theft wheel bolt

6 - Protective cap

- Install onto anti-theft wheel bolt

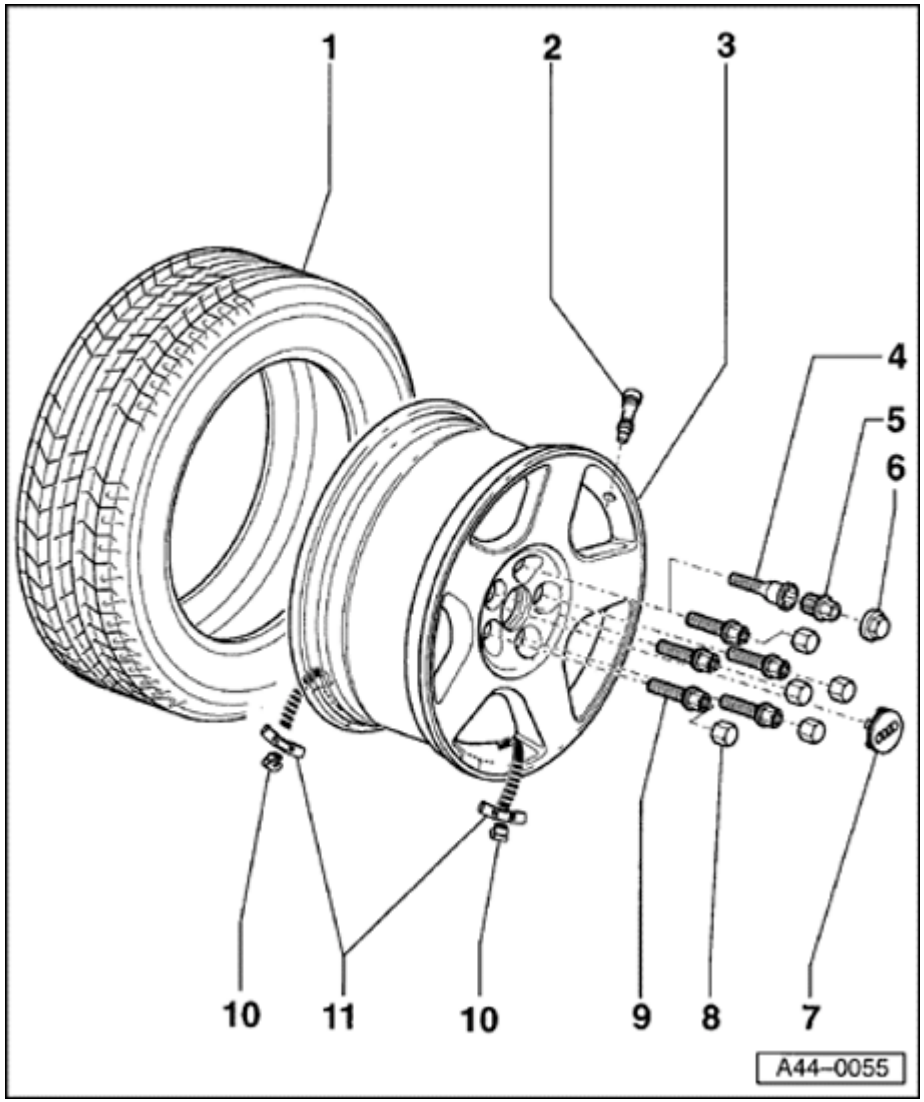
7 - Center cap

8 - Protective caps

- Install onto wheel bolts

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9 - Wheel bolts M14 x 1.5 x 27.5

- 120 Nm (89 ft lb)

10 - Retainer springs for balancing weights

11 - Balancing weights

- Maximum allowable weight: 60g (2.1 oz.) per rim flange

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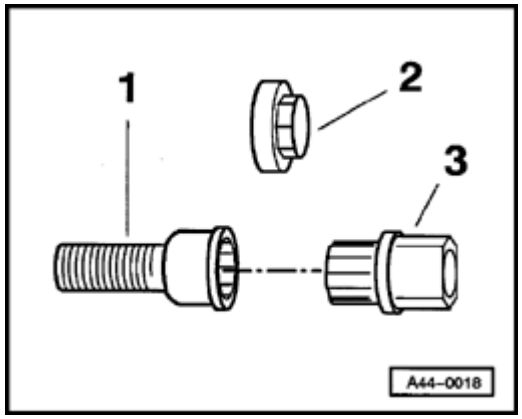


Fig. 1 Anti-theft wheel bolt

1 - Anti-theft wheel bolt

2 - Protective cap

3 - Wheel bolt adapter

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Wheels, balancing on vehicle

Always deactivate the traction control system (ASR) before balancing the wheels.

Notes:

- *Incorrectly balanced wheels cause steering wheel vibration and shuddering at the front of the vehicle.*
- *Where applicable, position the vehicle on the sensor platforms (front axle only for front wheel drive, both axles for all wheel drive) in order to carry out wheel balancing.*
- *Observe the wheel balancing equipment manufacturer's operating instructions.*

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Wheel alignment

WARNING!

- ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

The wheel alignment should be measured using VW/Audi approved wheel alignment equipment.

Wheel alignment checks must always include both the front and the rear axles. Otherwise the proper running characteristics of the vehicle cannot be ensured.

Notes:

- *The wheel alignment should not be checked before the vehicle has completed 1000-2000 km (600-1200 miles) so that the coil springs have time to settle.*

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- *When making adjustments, the relevant specifications should be adhered to as closely as possible.*

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Suspension codes, checking requirements

Information on weight codes (code number)

From m.y. 1998 ➢, spring/shock assemblies will be classified according to weight codes (code number) so that suspension components can be matched easily.

The spring/shock assembly installed in the vehicle is indicated by the weight code on the vehicle data label.

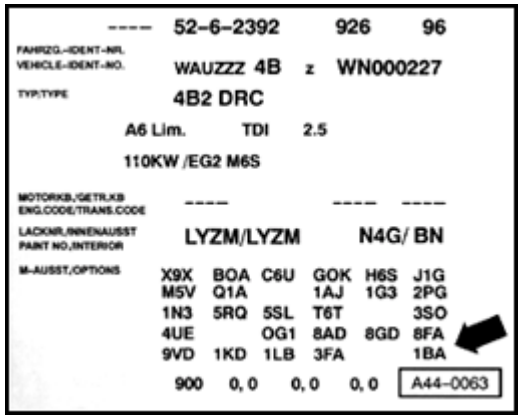
Specified values for wheel alignment

1BA = Standard suspension

1BC = Special purpose suspension

Special purpose vehicles suspension -1BC- have the same specified values for wheel alignment as the standard suspension -1BA-.

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Example of vehicle data label

In this example the vehicle is installed with the standard suspension, version 1BA (arrow).

The vehicle data label is located in the spare wheel recess and in the vehicle Maintenance booklet.

Factory codes for the suspension:

- 1BA: Standard suspension
- 1BE: Sport suspension
- 1BB: Heavy duty suspension (approx. 20 mm (3/4 in.) higher)
- 1BC: Special purpose suspension
- 1BD: Sport suspension, Audi S4
- 1BH: USA
- 1BT: Heavy duty suspension (approx. 7 mm or 1/4 in. higher)
- 1BP: Heavy duty suspension (same ride height as 1BA but with limited bump)

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Requirements

- Test equipment must be properly adjusted and attached to vehicle (refer to equipment manufacturer's instructions)
- Equal tread depth for both tires on each axle, with difference between two not more than 2 mm (0.079 in.)
- Tires inflated to correct pressure
- Sliding plates and turntables not positioned against any stop when checking wheel alignment
- Vehicle at correct curb weight 1)
- Vehicle accurately positioned, suspension bounced and rocked several times and allowed to settle
- Suspension, steering and steering linkage in proper condition with no damage or excessive play
- Carry out axial wheel run-out compensation. Since some wheel run-out is allowable,

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checking alignment without first compensating for axial wheel run out may indicate that the toe-in tolerance is already exceeded. If this is the case it is not possible to set toe-in without first compensating for wheel run-out

1) Curb weight is defined as: the weight of the vehicle ready for the road (fuel tank completely full, spare wheel, vehicle tool kit and vehicle jack all in specified positions).

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Wheel alignment must be checked if

- There are problems with vehicle performance.
- There is accident damage.
- Tires are worn on one side.
- Axle components have been removed ⇒ table below.

Front axle component removed or replaced	Alignment check required		S-point adjustment required		Rear axle component removed or replaced	Alignment check required	
	Yes	No	Yes	No		Yes	No
Rear upper link		X		X	Shock absorber		X
Front upper link	X		X				
Guide link with hydraulic-bushing		X		X	Coil spring		X
Suspension strut		X		X			
Track control link		X		X	Upper control arm 1)	X	
Mounting bracket	X		X		Lower control arm 1)	X	
Wheel bearing housing	X		X		Wheel bearing housing1)	X	
Tie rod	X		X		Track rod 1)	X	
Steering gear	X		X		Subframe 1)	X	

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Subframe	X		X		Torsion beam axle assembly (FWD)	X	
Stabilizer bar		X			Stabilizer bar		X

1) Only affects vehicles with all wheel drive

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Wheel alignment specifications (front-wheel-drive vehicles)

- Specifications valid for all engine versions

Front axle	Standard suspension (1BA) Special suspension (1BC) Heavy duty suspension (1BP)	Sport suspension (1BE)	Heavy duty suspension (1BB), (1BT1))
Camber	-25 ′ ± 25 ′	-40 ′ ± 25 ′	-15 ′ ± 25 ′ -30 ′ ± 25 ′ 1)
Maximum allowable difference in camber between two sides	30 ′	30 ′	30 ′
Toe setting for each wheel (curb weight)	+10 ′ ± 2 ′	+10 ′ ± 2 ′	+10 ′ ± 2 ′
Toe check value for each wheel (curb weight)	+10 ′ ± 5 ′	+10 ′ ± 5 ′	+10 ′ ± 5 ′
Toe constant for each wheel (setting value)	+7 ′ ± 2 ′	+7 ′ ± 2 ′	+7 ′ ± 2 ′
Toe constant for each wheel (check value)	+7 ′ ± 7 ′	+7 ′ ± 7 ′	+7 ′ ± 7 ′
Toe-out on turns at 20°	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′
1) Applies only to vehicles with heavy duty suspension (1BT)			

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Rear axle	Standard suspension (1BA) Special suspension (1BC) Heavy duty suspension (1BP)	Sport suspension (1BE)	Heavy duty suspension (1BB), (1BT1))
Camber	-1° 30′ ± 20′	-1° 30′ ± 20′	-1° 30′ ± 20′
Maximum allowable difference in camber between two sides	30′	30′	30′
Overall toe	+20′ +15′/-10′	+28′ +15′/-10′	+14′ +15′/-10′ +17′ +15′/-10′ 1)
Maximum allowable difference in direction of travel relative to longitudinal vehicle center line (thrust angle)	± 15′	± 15′	± 15′
1) Applies only to vehicles with heavy duty suspension (1BT)			

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Wheel alignment specifications (all-wheel-drive vehicles)

- Specifications valid for all engine versions

Front axle	Standard suspension (1BA) Special suspension (1BC) Heavy duty suspension (1BP)	Sport suspension (1BE)	Heavy duty suspension (1BB), (1BT1))
Camber	-25 ′ ± 25 ′	-40 ′ ± 25 ′	-15 ′ ± 25 ′ -30 ′ ± 25 ′
Maximum allowable difference in camber between two sides	30 ′	30 ′	30 ′
Toe setting for each wheel (curb weight)	+10 ′ ± 2 ′	+10 ′ ± 2 ′	+10 ′ ± 2 ′
Toe check value for each wheel (curb weight)	+10 ′ ± 5 ′	+10 ′ ± 5 ′	+10 ′ ± 5 ′
Toe constant for each wheel (setting value)	+7 ′ ± 2 ′	+7 ′ ± 2 ′	+7 ′ ± 2 ′
Toe constant for each wheel (check value)	+7 ′ ± 7 ′	+7 ′ ± 7 ′	+7 ′ ± 7 ′
Toe-out on turns at 20°	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′
1) Applies only to vehicles with heavy duty suspension (1BT)			

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Rear axle	Standard suspension (1BA) Special suspension (1BC) Heavy duty suspension (1BP)	Sport suspension (1BE)	Heavy duty suspension (1BB), (1BT1))
Camber	-40 ′ ± 30 ′	-40 ′ ± 30 ′	-40 ′ ± 30 ′
Maximum allowable difference in camber between two sides	30 ′	30 ′	30 ′
Overall toe	+8 ′ ± 5 ′	+8 ′ ± 5 ′	+8 ′ ± 5 ′
Maximum allowable difference in direction of travel relative to longitudinal vehicle center line (thrust angle)	± 10 ′	± 10 ′	± 10 ′
1) Applies only to vehicles with heavy duty suspension (1BT)			

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44-15

Wheel alignment specifications (front-wheel-drive vehicles with aluminium mounting bracket)

- Specifications valid for all engine versions

Front axle	Standard suspension (1BA) Special suspension (1BC) Heavy duty suspension (1BP)	Sport suspension (1BE)	Heavy duty suspension (1BB), (1BT1))
Camber	-35 ′ ± 25 ′	-50 ′ ± 25 ′	-20 ′ ± 25 ′ -30 ′ ± 25 ′
Maximum allowable difference in camber between two sides	30 ′	30 ′	30 ′
Toe setting for each wheel (curb weight)	+10 ′ ± 2 ′	+10 ′ ± 2 ′	+10 ′ ± 2 ′
Toe check value for each wheel (curb weight)	+10 ′ ± 5 ′	+10 ′ ± 5 ′	+10 ′ ± 5 ′
Toe constant for each wheel (setting value)	+9 ′ ± 2 ′	+9 ′ ± 2 ′	+9 ′ ± 2 ′
Toe constant for each wheel (check value)	+9 ′ ± 7 ′	+9 ′ ± 7 ′	+9 ′ ± 7 ′
Toe-out on turns at 20°	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′
1) Applies only to vehicles with heavy duty suspension (1BT)			

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44-16

Wheel alignment specifications (all-wheel-drive vehicles with aluminium mounting bracket)

- Specifications valid for all engine versions

Front axle	Standard suspension (1BA) Special suspension (1BC) Heavy duty suspension (1BP)	Sport suspension (1BE)	Heavy duty suspension (1BB), (1BT1))
Camber	-35 ′ ± 25 ′	-50 ′ ± 25 ′	-20 ′ ± 25 ′ -30 ′ ± 25 ′
Maximum allowable difference in camber between two sides	30 ′	30 ′	30 ′
Toe setting for each wheel (curb weight)	+10 ′ ± 2 ′	+10 ′ ± 2 ′	+10 ′ ± 2 ′
Toe check value for each wheel (curb weight)	+10 ′ ± 5 ′	+10 ′ ± 5 ′	+10 ′ ± 5 ′
Toe constant for each wheel (setting value)	+9 ′ ± 2 ′	+9 ′ ± 2 ′	+9 ′ ± 2 ′
Toe constant for each wheel (check value)	+9 ′ ± 7 ′	+9 ′ ± 7 ′	+9 ′ ± 7 ′
Toe-out on turns at 20°	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′	-1° 20 ′ ± 30 ′
1) Applies only to vehicles with heavy duty suspension (1BT)			

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44-17

Wheel alignment specifications, sport suspension (1BD)

Front axle	**Sport suspension (1BD)**
Camber	-50 ′ ± 25 ′
Maximum allowable difference in camber between two sides	30 ′
Toe setting for each wheel (curb weight)	+10 ′ ± 2 ′
Toe check value for each wheel (curb weight)	+10 ′ ± 5 ′
Toe constant for each wheel (setting value)	+7 ′ ± 2 ′
Toe constant for each wheel (check value)	+7 ′ ± 7 ′
Toe-out on turns at 20°	-1° 30 ′ ± 30 ′
Rear axle	**Sport suspension (1BD)**
Camber	-55 ′ ± 15 ′
Maximum allowable difference in camber between two sides	30 ′
Overall toe	+8 ′ ± 5 ′
Maximum allowable difference in direction of travel relative to longitudinal vehicle center line (thrust angle)	± 10 ′

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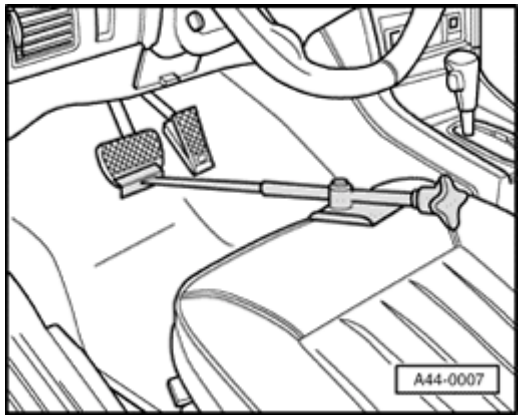
44-18

Wheel alignment, preparations for checking

Special tools, test requirements and auxiliary items

VAG1907	VAG1941	VAG1925
VAG1925/3	VAG1925/4	VAG1925/6
Electronic alignment unit; e.g. VAG1813		

- Carry out wheel run-out compensation.



- Install brake pedal depressor.

Note:

On accident damaged vehicles, use special tool VAG1907 to make certain that the rack is in the center position.

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Wheel alignment, mandatory sequence of operations for checking

Overview of sequence of operations for measuring wheel alignment

- Vehicle must only be measured at curb weight

Note:

Exception: when measuring the toe-in curve as described in the alignment program instructions.

The following work sequences must be adhered to

1 - Check front axle camber centering and adjust if necessary ⇒ page 44-24 .

2 - Check rear axle camber and adjust if necessary:

FWD vehicles ⇒ page 44-20

AWD vehicles ⇒ page 44-22

3 - Check rear axle and adjust if necessary:

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FWD vehicles ⇒ page 44-21

AWD vehicles ⇒ page 44-23

4 - If necessary, check toe-in curve on front axle.

To determine if the toe-in curve or toe constant "S" needs adjusting ⇒ table on page 44-10 and also page ⇒ Page 44-27 .

5 - Check front axle toe with vehicle at curb weight and adjust if necessary ⇒ page 44-38 .

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Rear axle camber (front-wheel-drive vehicles), checking

Wheel alignment specifications ⇒ page 44-11 .

The rear axle camber can be checked but not adjusted on vehicles with front wheel drive.

If the readings are outside the allowable tolerances the axle beam must be checked for damage and replaced if necessary.

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44-21

Rear axle toe (front-wheel-drive vehicles), centering

Individual toe settings on the rear axle cannot be adjusted.

By moving the rear axle within the elongated holes it is possible to center the individual toe settings.

- Loosen securing bolts on mounting brackets.

- Center individual toe settings by moving axle beam within elongated holes at mounting brackets.

If the overall toe setting is outside the allowable tolerance, or if it is not possible to center the individual settings, the axle beam must be checked for damage and replaced if necessary.

The body alignment must also be checked/measured in the area of the rear axle mounting points and serviced as necessary.

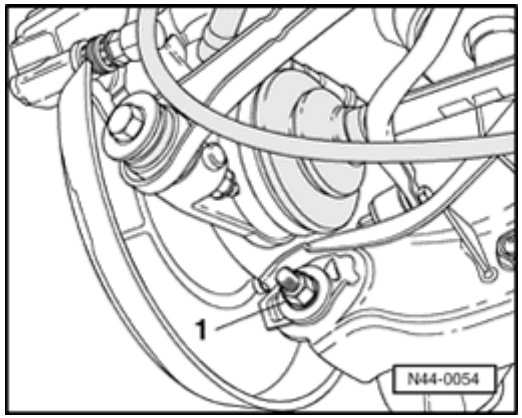
⇒ Repair Manual, Body Collision Repair

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44-22

Rear axle camber (all-wheel-drive vehicles), adjusting

Wheel alignment specifications ⇒ page 44-13



- Loosen mounting nuts -1-.
- Adjust camber by turning eccentric bolt.

Note:

The maximum adjustment range is 90° to the left or right of the center position.

- Tighten mounting nut, check camber again and if necessary re-adjust.

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44-23

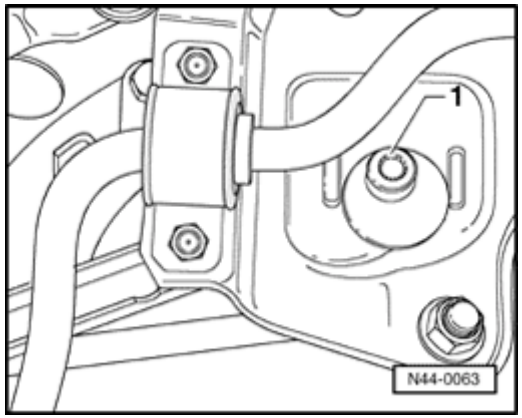
Rear axle toe (all-wheel-drive vehicles), setting

Wheel alignment specifications ⇒ page 44-13

- Loosen mounting nut -1-.

Notes:

- *The maximum adjustment range is 90° to the left or right of the center position.*
- *Adjusting the individual toe settings automatically alters the thrust angle of the axle.*



- Adjust individual toe settings as necessary by turning eccentric bolt.
- Tighten mounting nut, check settings again and if necessary re-adjust.

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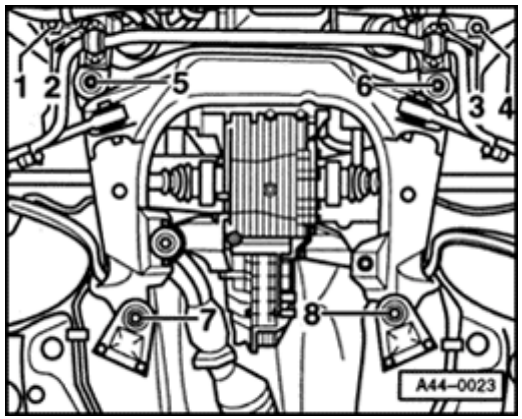
44-24

Front axle camber, adjusting

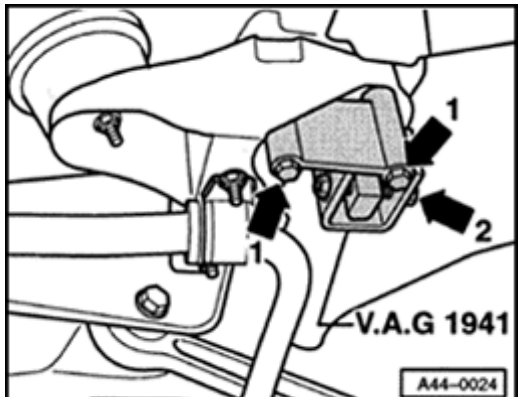
The camber cannot be adjusted.

By moving the subframe it is possible to center the camber uniformly within the specified tolerance range.

- Remove noise insulation panel.



- Remove bolts -3- and -4-.

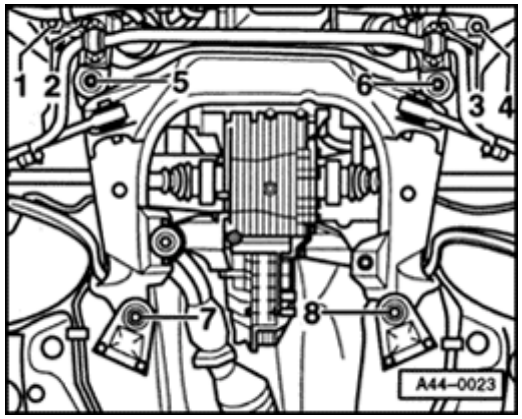


- Install VAG1941 camber adjustment tool.

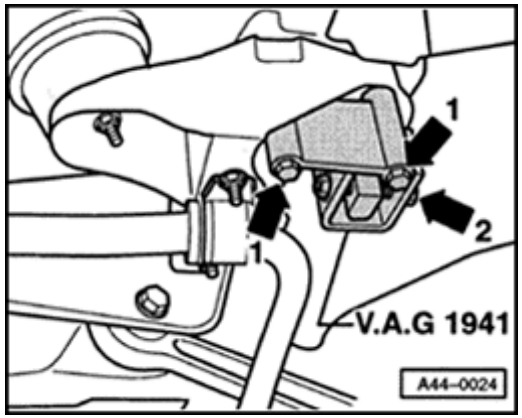
  Tightening torque of bolts -1-: 10 Nm (7 ft lb)

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44-25



- Loosen bolts -1-, -2-, -5-, -6-, -7- and -8-.



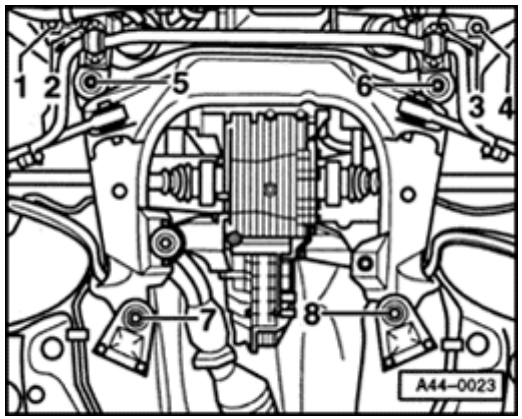
- Turn bolt -2- until specifications are achieved.

Wheel alignment specifications ⇒ page 44-13 .

- Relieve tension on bolt -2- and check readings obtained. If necessary, correct camber again.

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44-26



Removing VAG1941 camber adjustment tool

- At least two bolts must always be tightened so that the position of the subframe does not change.
- Bolts -5-, -6-, -7- and -8- must always be replaced.

- Tighten bolts -7- and -8-.

  Tightening torque: 110 Nm (81 ft lb) + 1/4-turn (90°)
- Remove VAG1941 camber adjustment tool.
- Tighten both forward bolts -5- and -6-.

  Tightening torque: 110 Nm (81 ft lb) + 1/4-turn (90°)
- Tighten bolts -1-, -2-, -3- and -4-.

  Tightening torque: 60 Nm (44 ft lb)

CAUTION!

Whenever the camber is adjusted, all wheel alignment settings must be re-checked.

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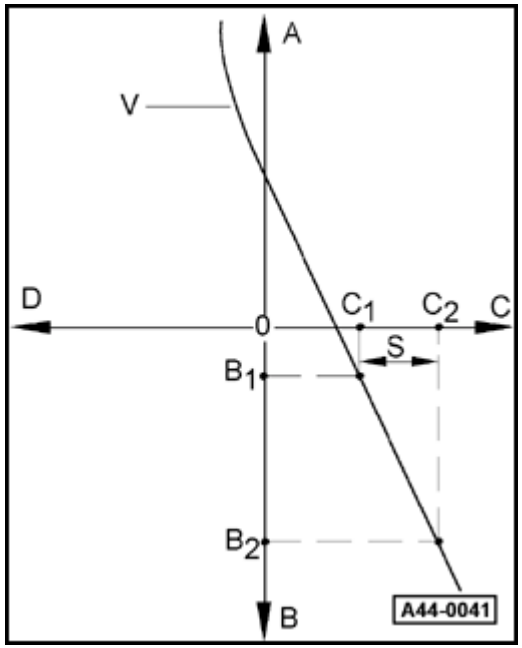
44-27

Front axle toe-in curve, adjusting

General

Toe-in curve

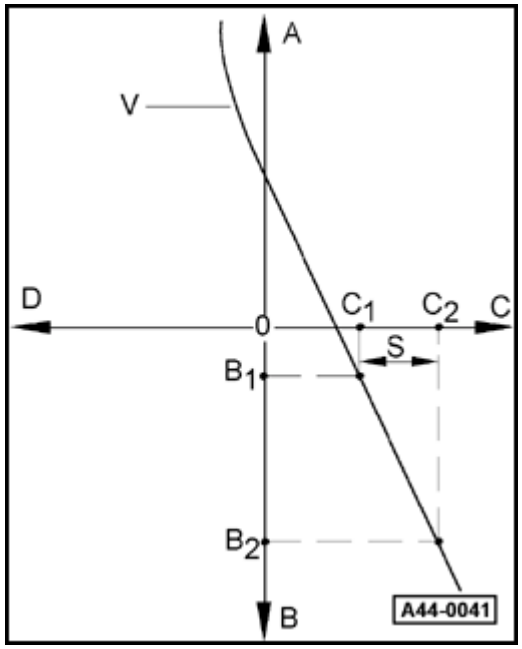
Notes:



Explanation of the term "toe-in curve":

- *When the suspension is compressed (bumped) or extended (rebounded) the toe of the wheel changes relative to the amount of compression or extension.*
- *The resulting toe values can be plotted on a graph to obtain the toe-in curve.*
- *The shape of this curve is determined by toe value C1 (measured with the wheel in a defined starting position B1) and by toe value C2 measured at a rebound, or extension, of 40 mm or 1.57 in. (for heavy duty suspension 1BB) or of 60 mm or 2.36 in. (for all other suspensions) relative to starting position B1).*
- *The resulting change in toe-in, (C2 - C1) is defined as "toe constant S."*

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Sport suspension 1BE

A Spring compression

B Spring extension (rebound)

B1 Defined starting position (vehicle at curb weight)

On vehicles with sport suspension, suspension must be extended 20 mm (0.78 in.) to this position.

B2 Vehicle suspension extended 60 mm (2.36 in.) compared to position B1 ⇒ page 44-31

C Toe-in

C1 Toe-in measured in position B1

C2 Toe-in measured in position B2

D Toe-out

V Toe-in curve

S Toe constant, C2 - C1

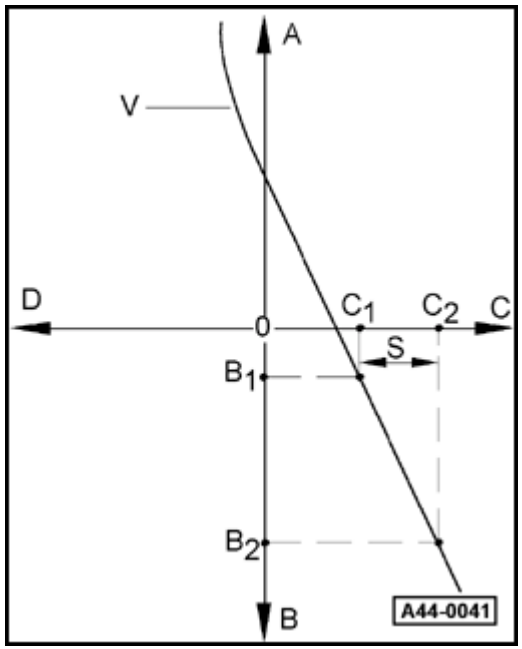
Notes:

The toe-in curve must also be checked in the following cases (in addition to those specified in table ⇒ page 44-10):

- *If the vehicle has been in an accident or sustained damage to the suspension components and/or bodywork.*
- *If the vehicle does not maintain direction of travel over bumps and when braking or accelerating.*

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44-29



Standard suspension 1BA, special suspension (1BC) and heavy duty suspension 1BP

On vehicles with standard running gear, the toe-in measurement C1 is measured in the defined starting position (vehicle at curb weight) B1 ⇒ page 44-30 .

B2 Vehicle suspension extended 60 mm (2.36 in.) compared to position B1

C2 Toe-in measured in position B2

Heavy duty suspension 1BB (vehicle ride height 20 mm higher)

On vehicles with heavy duty suspension 1BB:

C1 Toe-in measured in position B1 (defined starting position) ⇒ page 44-32

C2 Toe-in measured in position B2

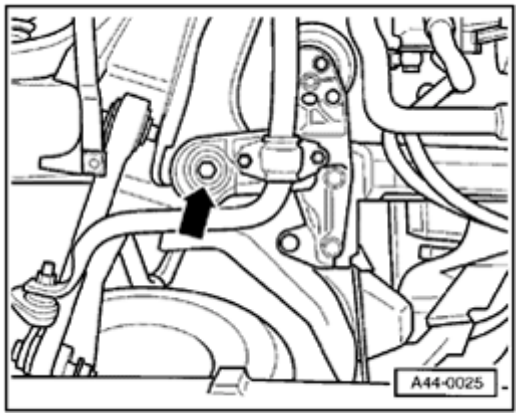
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44-30

Setting suspension to starting position B1 (⇒ page 44-27) on vehicles with standard suspension (1BA), special suspension (1BC) and heavy duty suspension (1BP)

Note:

Depending on the type of wheel alignment equipment used, it may be necessary to raise the front of the vehicle in order to position the VAG1925 spacer. After lowering the vehicle again the suspension must be bounced.



- Insert VAG1925 spacer together with VAG1925/4 adapters and screw both threaded spindles out until they just rest against front subframe bolts (arrow).

Do not raise the vehicle using the above procedure

The vehicle is now in the defined starting position B1 (for vehicles with standard suspension (1BA), special suspension (1BC) and heavy duty suspension (1BP).

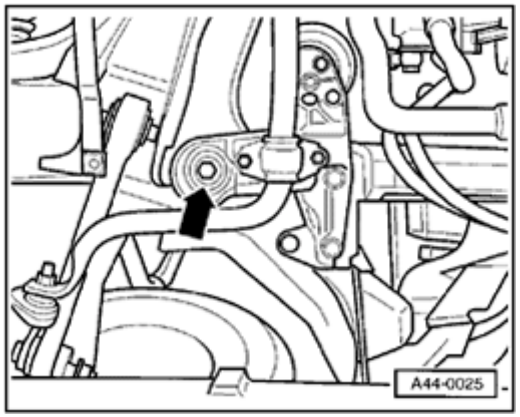
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44-31

Setting suspension to starting position B1 (⇒ page 44-27) on vehicles with sport suspension

Note:

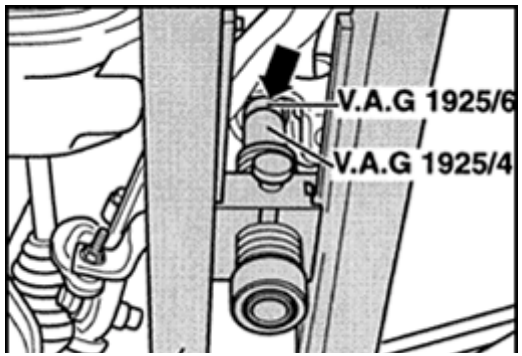
Depending on the type of wheel alignment equipment used, it may be necessary to raise the front of the vehicle in order to position the VAG1925 spacer. After lowering the vehicle again the suspension must be bounced.



- Insert VAG1925 spacer together with VAG1925/4 adapters and screw both threaded spindles out until they just rest against front subframe bolts (arrow).

Make sure vehicle is not raised using the above procedure

- Raise vehicle at front lifting points.



- Insert VAG1925/6 adapter onto VAG1925/4 adapter for spacer gauge.
- Lower vehicle onto adapters.

The vehicle is now in defined starting position B1 (for vehicles with sport suspension).

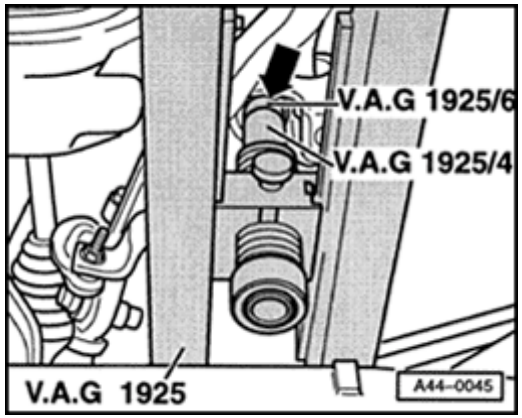
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44-32

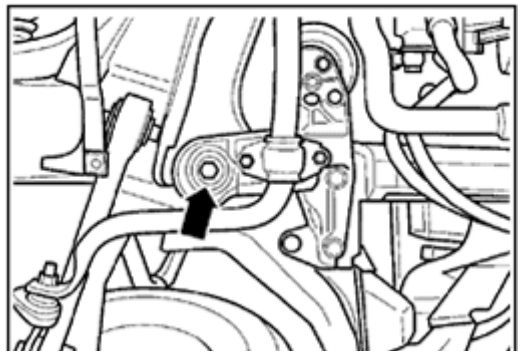
Bring vehicles with heavy duty suspension 1BB (vehicle ride height 20 mm higher) into defined starting position B1 ⇒ page 44-28

Note:

Depending on the type of wheel alignment equipment used, it may be necessary to raise the front of the vehicle in order to position the VAG1925 spacer. After lowering the vehicle again the suspension must be bounced.



- Insert VAG1925 spacer together with VAG1925/4 adapters and screw both threaded spindles out...



- ...until they just rest against front subframe bolts (arrow).

Make sure vehicle is not raised using the above procedure

- Vehicle with heavy duty suspension 1BB is now in defined starting position B1

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44-33

Notes:

For all suspension versions (1BA, 1BC, 1BE, 1BP and 1BB):

- *The defined starting position B1 is the position the springs must be in when using the wheel alignment program to check the actual toe-in setting C1 for each wheel (⇒ page 44-27). Setting C1 should match the specification + 10` ± 30` (rough pre-adjustment). If necessary, the toe-in must be corrected by adjusting the tie rod length.*

- *Wheel alignment specifications ⇒ page 44-11 .*

- *If the settings need to be corrected, this will be indicated by the wheel alignment program.*

CAUTION!

- ***Make sure that the wheels do not loose contact with the turntables during the lifting operation.***

- ***If wheels do loose contact, do not move the turntables. Otherwise incorrect measurements will result.***

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44-34

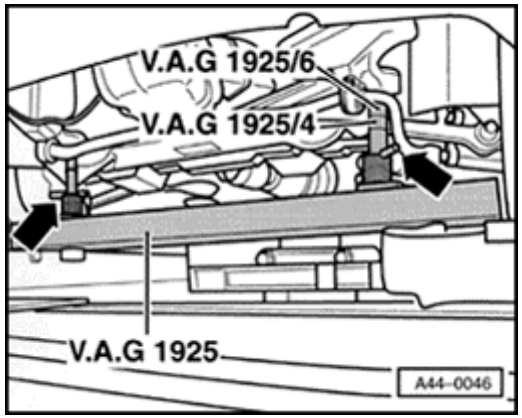
Extending the springs (standard, sport and heavy duty (1BP) suspensions

CAUTION!

- ***Make sure that the wheels do not lose contact with the turntables during the lifting operation.***

- ***If wheels do lose contact, do not move the turntables. Otherwise incorrect measurements will result.***

- Raise vehicle at front jacking points.



- Lift cylinders out of threaded spindles and secure in position using locking pins.
  - Make sure locking pins (arrows) are correctly positioned.
- Lower vehicle down onto spacer gauge.

Vehicle is now in position B2 ⇒ page 44-27

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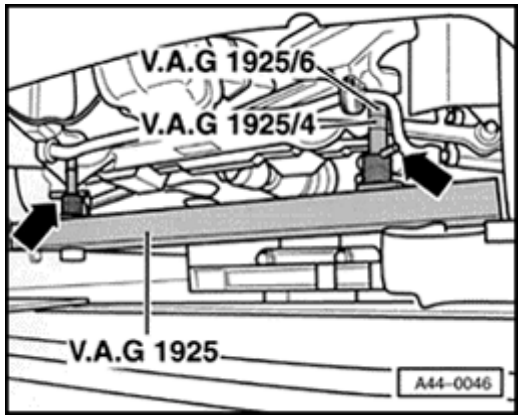
Extending the springs (heavy duty suspension (1BB)

CAUTION!

- ***Make sure that the wheels do not lose contact with the turntables during the lifting operation.***

- ***If wheels do lose contact, do not move the turntables. Otherwise incorrect measurements will result.***

- Raise vehicle at front jacking points.



- Lift cylinders out of threaded spindles and secure in position using locking pins.
  - Make sure locking pins (arrows) are correctly positioned.
- Remove VAG1925/6 adapter.
- Lower vehicle down onto spacer gauge.

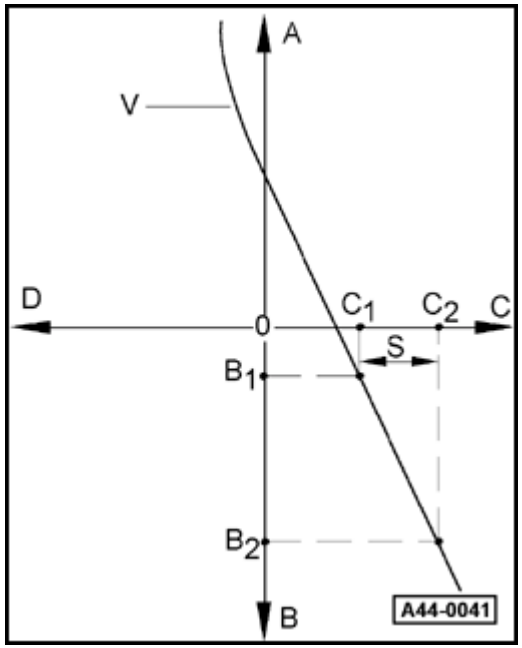
Vehicle is now in position B2 ⇒ page 44-27

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44-36

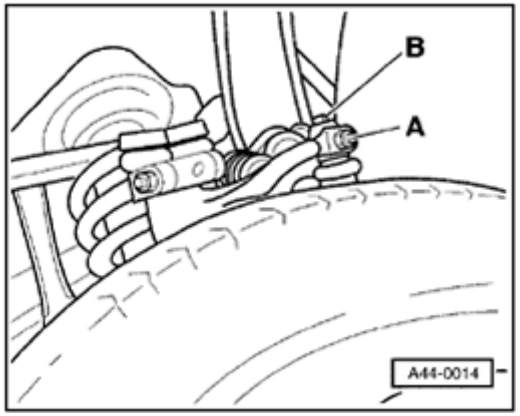
Note:

The wheel alignment program determines the current right and left toe constant (actual values of C2 - C1 ⇒ page 44-27). The program checks whether the current toe constant (actual value) lies within the tolerance (control value) ⇒ vehicle alignment specifications tables, pages 44-11 and ⇒ Page 44-13 .



- If toe constant actual value lies outside control value tolerance, adjust toe value constant within adjusting value tolerance.
  - Front-wheel-drive vehicles ⇒ page 44-11
  - All-wheel-drive vehicles ⇒ page 44-13

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Adjusting toe constant "S"

- Loosen nut -A-.
- Back out bolt -B- approx. 4 mm (1/8 in.).
- Push tie rod end downward onto stop.
- Turn in adjusting bolt -B- until exact specifications are achieved.
- Tighten nut -A- to 45 Nm (33 ft lb) and check values.
- Tighten bolt -B- to 7 Nm (62 in. lb).
- Lower vehicle to defined starting position B1.
- Screw threaded spindle down.
- On vehicles with standard suspension, bounce suspension several times.

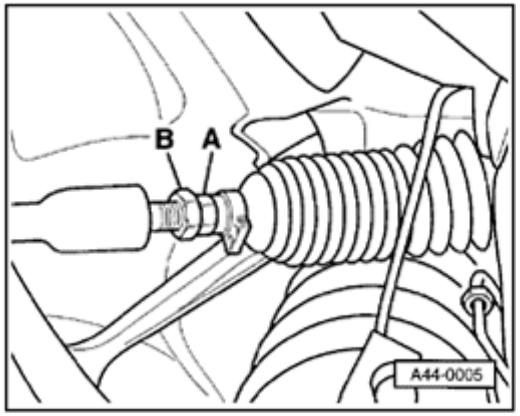
Checking toe constant after adjusting

The alignment unit checks the toe constant again.

- If the second check shows that the values are within the check value tolerance, the setting is OK.
- If the values are outside the check value tolerance, the setting must be adjusted again in position B2.
- Position B2: + 60 mm (2.36 in.).

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Front axle toe-in, setting



- Loosen lock nut -B-.

- Adjust toe on left and right at hex -A-.

Make sure that the boots are not twisted after turning the tie rods

Note:

Twisted boots will wear out quickly.

- Tighten lock nut -B- and check toe-in again.

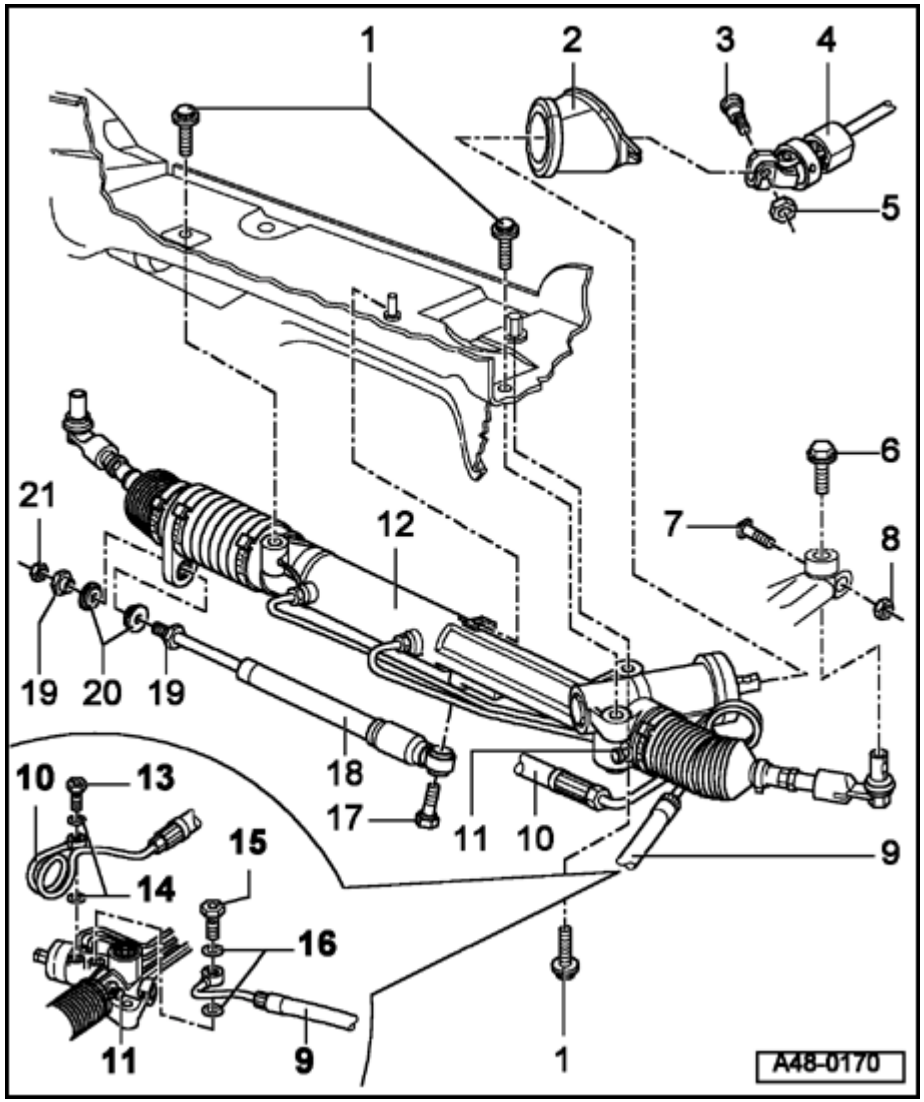
  Tightening torque: 40 Nm (30 ft lb)

After tightening lock nut -B- it is possible that the toe value may deviate slightly.

If the measured toe lies within the tolerances, the adjustment is correct.

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48-1



Steering gear components

1 - Bolt and washer assembly

- 65 Nm (48 ft lb)

2 - Boot seal

- Check for cracks and abrasions

3 - Eccentric bolt

- Torx® T50
- Turn clockwise to disengage
- Turn counter-clockwise to engage

4 - Steering column

5 - Self-locking nut

- Always replace
- 40 Nm (30 ft lb)

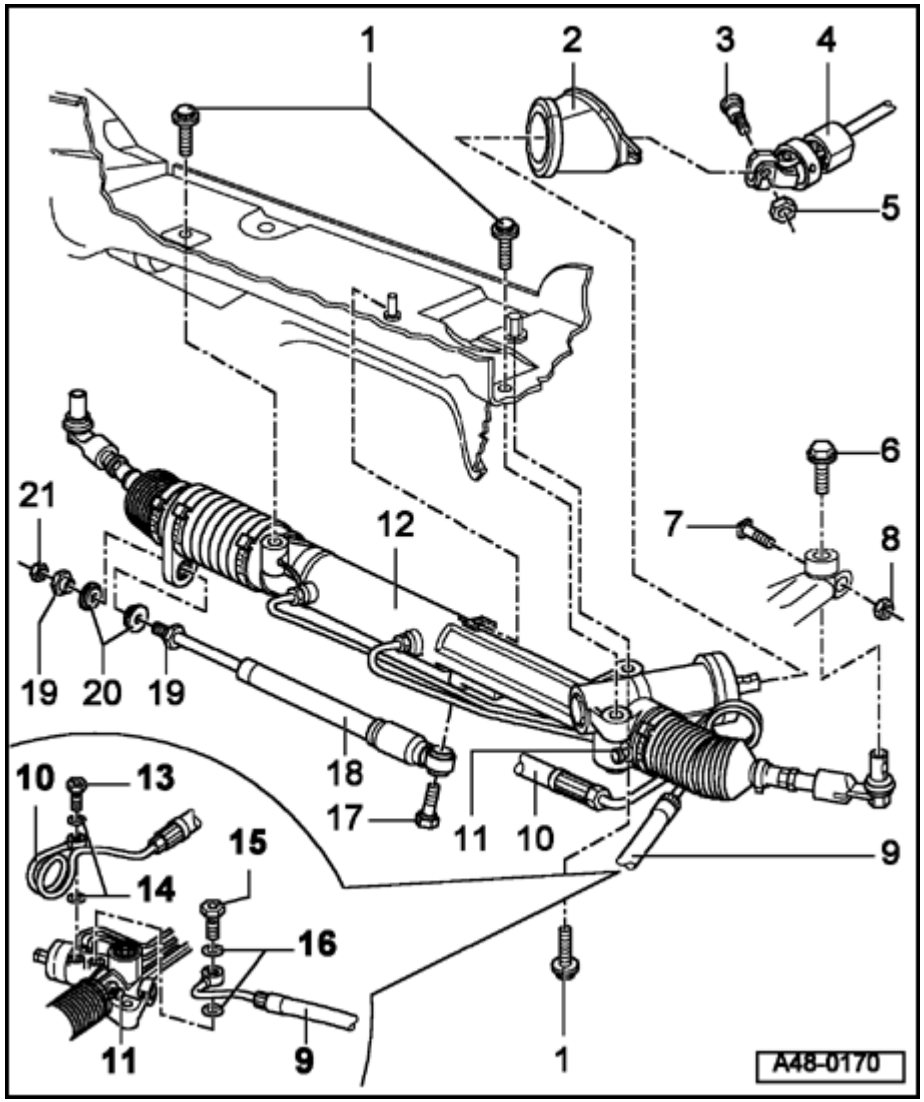
6 - Bolt w/washer assembly

- 7 Nm (62 in. lb)
- For adjusting toe-in curve

7 - Bolt

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48-2



8 - Self-locking nut

- Always replace
- 45 Nm (33 ft lb)

9 - Return hose

10 - Flexible hose

11 - Screw plug

- 13 Nm (10 ft lb)
- For centering steering gear ⇒ Fig. 1

12 - Power steering gear with tie rods

- Removing and installing ⇒ page 48-5

13 - Banjo bolt

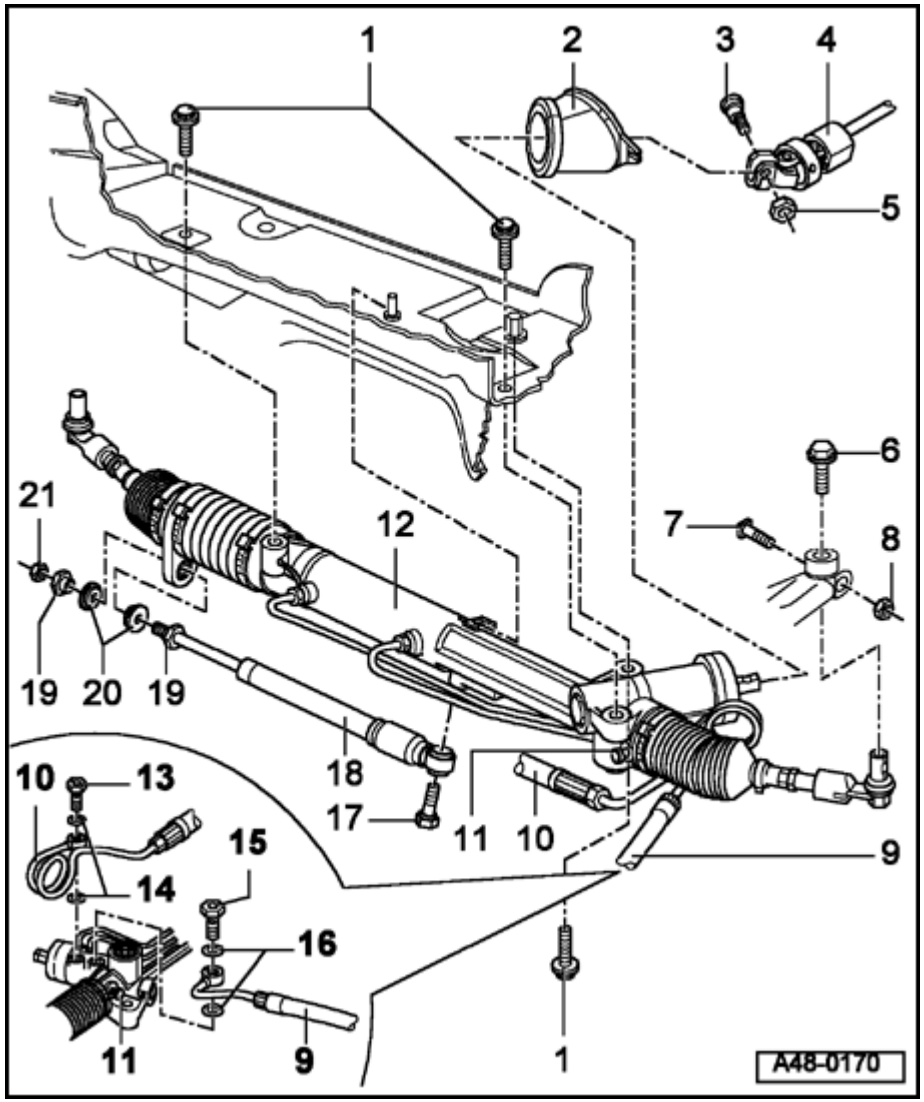
- 40 Nm (30 ft lb)
- With integrated check valve

14 - Seal 14 x 20

- Always replace

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48-3



15 - Banjo bolt

- 50 Nm (37 ft lb)

16 - Seal 16 x 22

- Always replace

17 - Bolt

- 35 Nm (26 ft lb)

18 - Steering damper

- 6-cyl. models
- 4-cyl models with 132 kW (177 Hp) m.y. 1998 ➢

19 - Bushing

20 - Rubber bushing

- Two-piece

21 - Nut

- 10 Nm (7 ft lb)
- Counter-hold at hex in piston rod of steering damper to loosen and tighten

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48-4

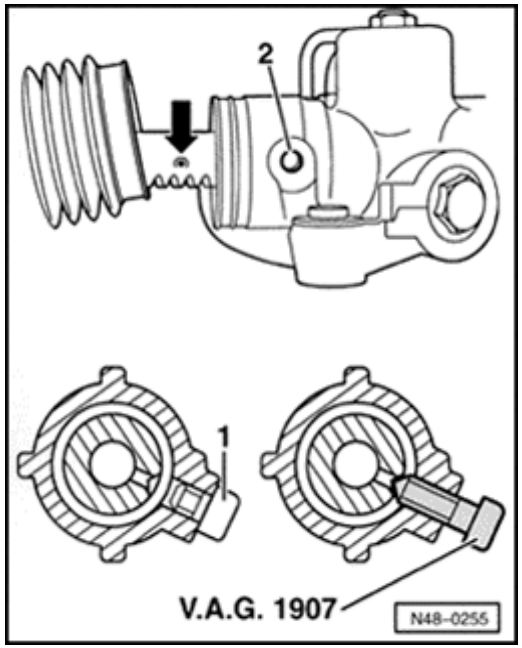


Fig. 1 Screw plug for centering steering gear

1 - Screw plug

2 - Threaded hole in steering gear

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48-5

Steering gear, removing and installing

Special tools, test equipment and auxiliary items

- Repair Manual, Body Exterior and Repair Manual, Body Interior
- VAG1907 centering tool
- 3094 hose clamps

Removing

- Remove plenum chamber cover.
- Remove battery.

CAUTION!

Before disconnecting the battery, determine the correct coding for the anti-theft radio.

- Remove driver's side storage compartment:

⇒ *Repair Manual, Body Interior, Repair Group*

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68

- Center steering wheel and remove ignition key.

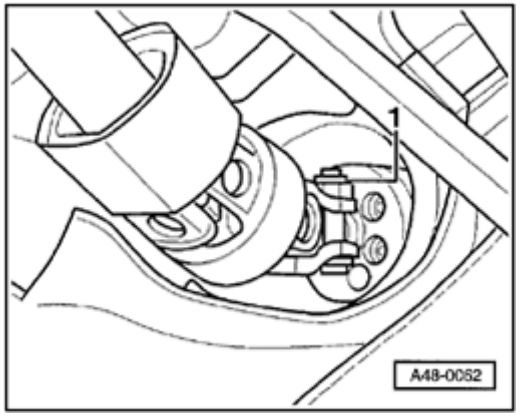
- Move steering wheel slightly so that steering lock engages.

CAUTION!

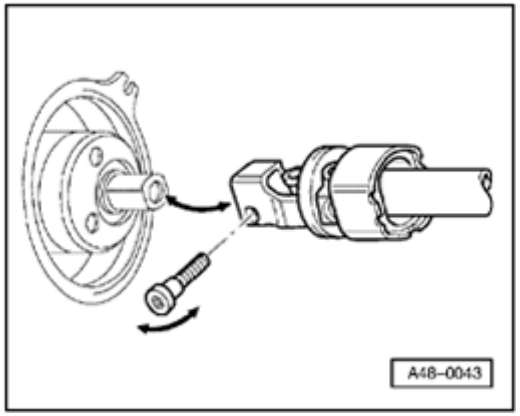
If the steering wheel is turned excessively with the steering gear removed, the spiral spring for the airbag system may be turned too far and damaged.

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48-6



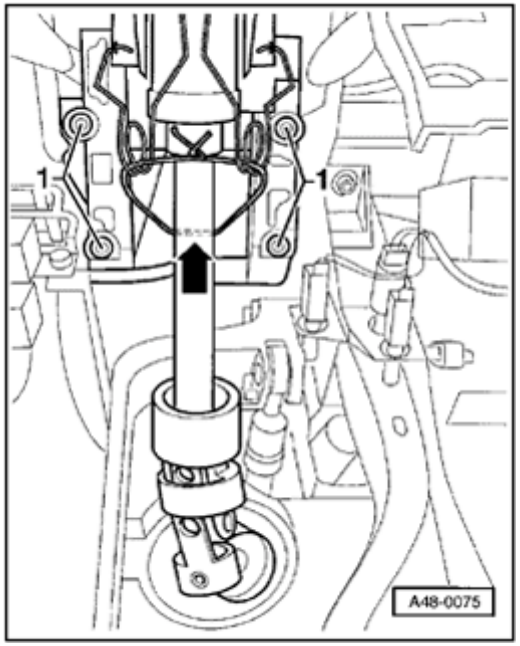
- Unscrew nut -1- at steering column universal joint.
- Release by turning eccentric bolt (Torx® T50) clockwise, and remove bolt.



- Swing universal joint clear.
- Pull bulkhead collar inward to remove.

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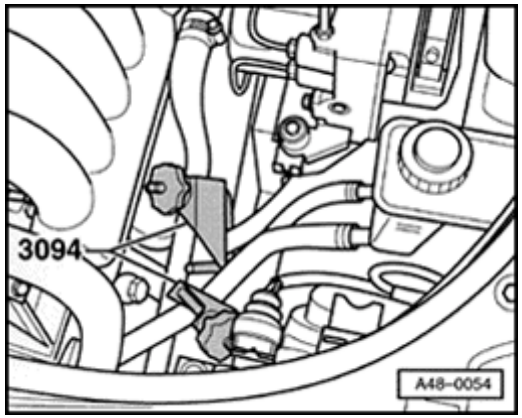
48-7



- Secure steering column with safety wire before removing steering column from steering gear pinion.

CAUTION!

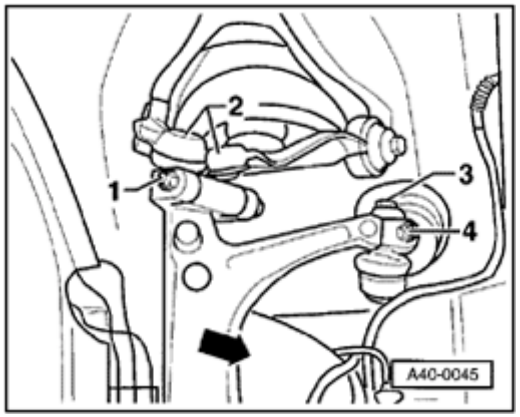
- ***The splines between top and bottom parts of the steering column must not be separated during the removal and installation procedure.***
- ***Turn the steering wheel into center position and do not alter position during repairs, otherwise the airbag unit spiral spring may be damaged.***



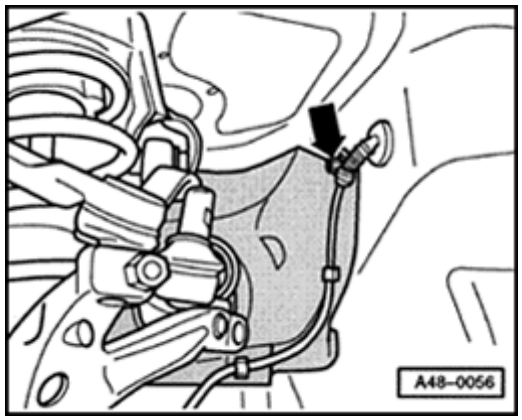
- Pinch off suction and return lines using 3094 hose clamps.

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- Remove front wheels.



- Remove bolts -3- and -4-.
- Disconnect tie rod ends.

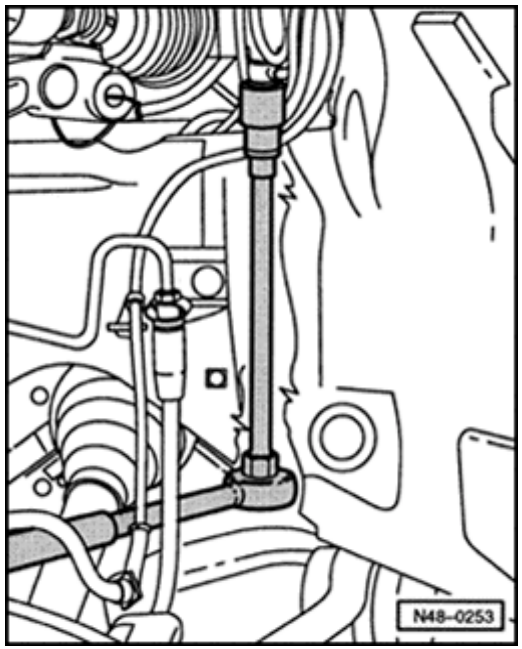


- Unscrew plastic nut (arrow).
- Pry out clips and remove cover (clips not visible in illustration).

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48-9

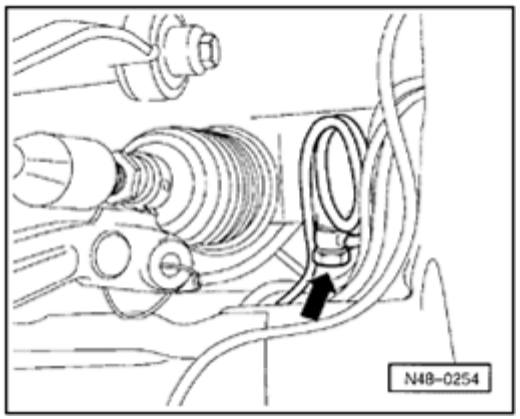
- Place drip tray underneath to catch hydraulic fluid.



- Remove 22 mm banjo bolts and disconnect return line from steering gear.

CAUTION!

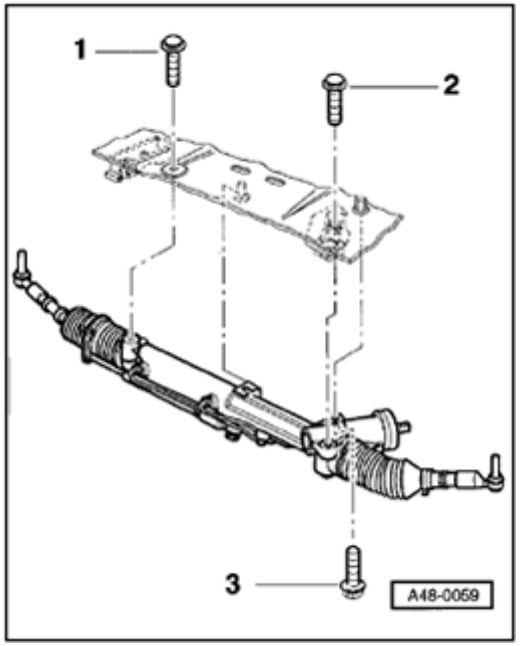
Always dispose of used hydraulic fluid properly.



- Remove 19 mm banjo bolt and disconnect supply line from steering gear.

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48-10



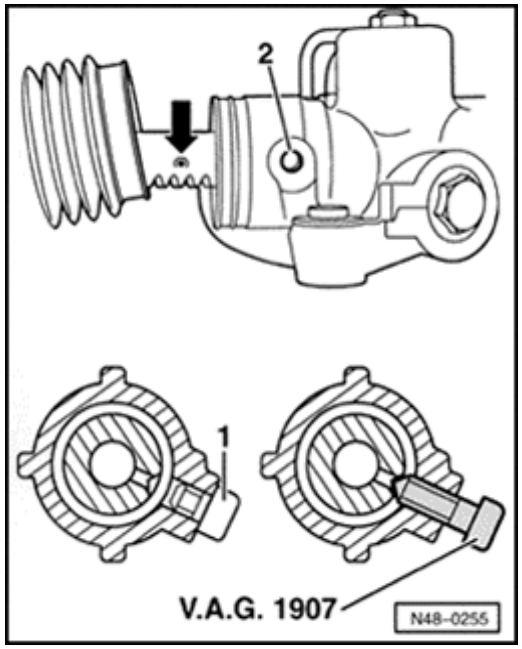
- Remove steering gear mounting bolts -1-, -2- and -3-.
- Remove steering gear through left-hand wheel housing (second technician required).

Note:

Make sure that the bulkhead seal is not damaged by the steering gear pinion.

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48-11



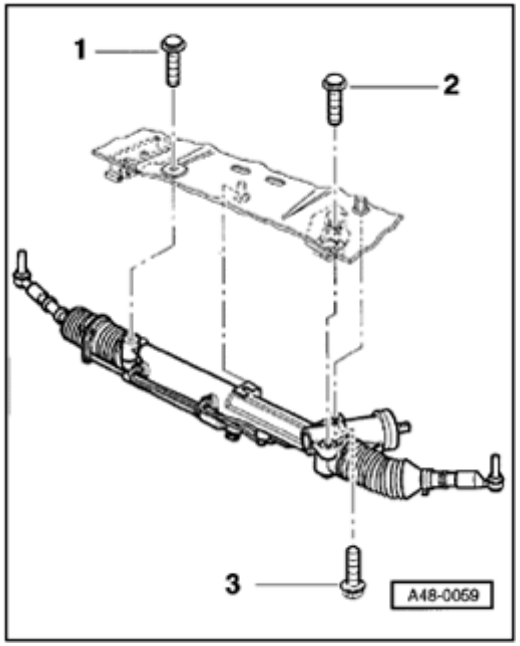
Installing

With the steering gear removed, VAG1907 is used to hold the rack in the in the center position during installation:

- Remove bolt -1- from steering gear.
- Align center mark (arrow) in rack with threaded hole -2- in steering gear.
- Install special tool VAG1907 hand-tight.

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48-12



- Position steering gear in plenum chamber.

Note:

Make sure threads and bolt contact surfaces are free of oil and grease.

- Install bolts -1- and -2- but do not tighten.
- Install bolt -3- and tighten to 65 Nm (48 ft lb).
- Tighten bolts -1- and -2- to 65 Nm (48 ft lb).
- Install return hose and tighten 22 mm banjo bolt.

  Tightening torque: 50 Nm (37 ft lb)
- Install supply line and tighten 19 mm banjo bolt.

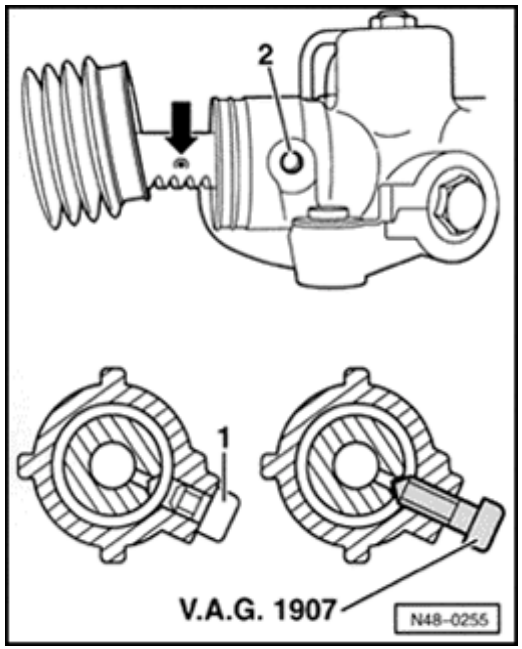
  Tightening torque: 40 Nm (30 ft lb)
- Re-install sealing boot.

Notes:

- *Damaged seals must be replaced.*
- *Make sure seals are properly seated.*

- Release steering column lock.
- Center steering wheel, then connect universal joint to steering pinion.

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- Install eccentric Torx® bolt, engage counterclockwise and tighten nut.

- Remove VAG1907 centering tool from steering gear.

1 - Socket-head bolt (screw plug)

2 - Threaded hole in steering gear

- Install socket-head bolt -1- to seal off steering gear.

  Tightening torque: 13 Nm (10 ft lb)

- Tighten nut on tensioning bolt.

  Tightening torque: 40 Nm (30 ft lb)

- Install driver's side storage compartment.
- Install wheel housing cover.
- After completely installing steering gear remove 3094 hose clamps.
- Install battery and enter code for radio if necessary.
- Check level of hydraulic fluid ⇒ page 48-22 .
- Bleed steering system ⇒ page 48-24 .
- Check steering system for leaks ⇒ page 48-25 .
- Check wheel alignment ⇒ page 44-6 .

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Tie rods, removing and installing

WARNING!

- ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

Special tools, test equipment and auxiliary items

VAG1923

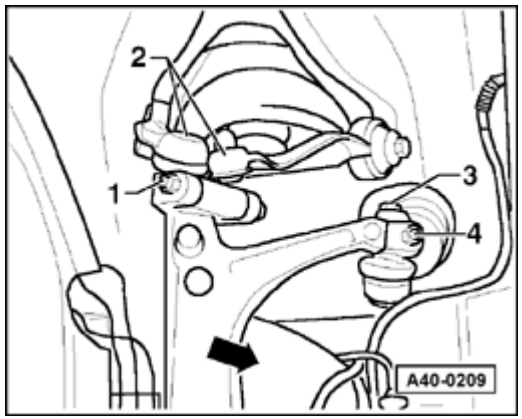
Notes:

- *Left and right-hand tie rods are identical.*

- *Tie rods can be removed and installed with the steering gear installed.*

Removing

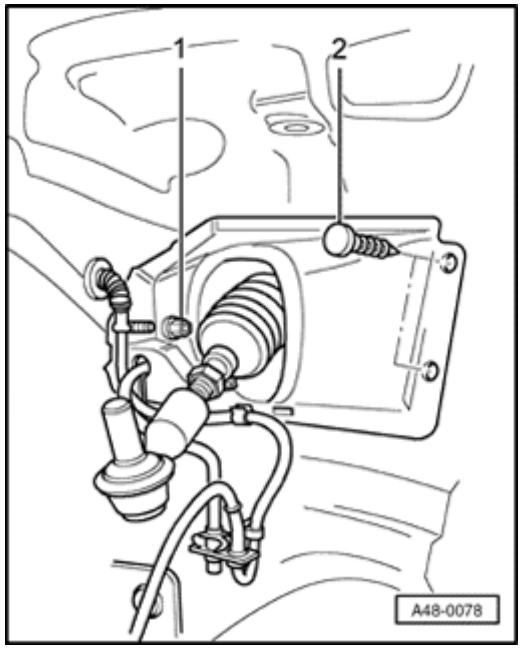
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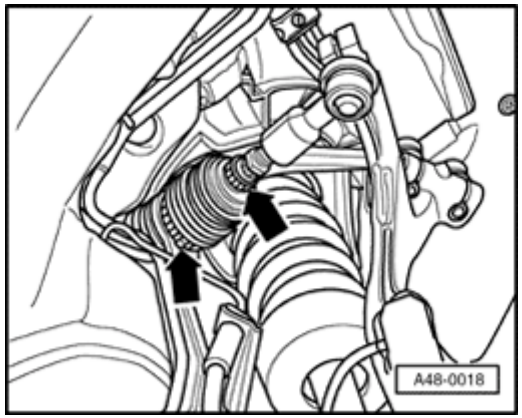
- Remove front wheel.

- Loosen bolts -3- and -4- and disconnect tie rod end downward.

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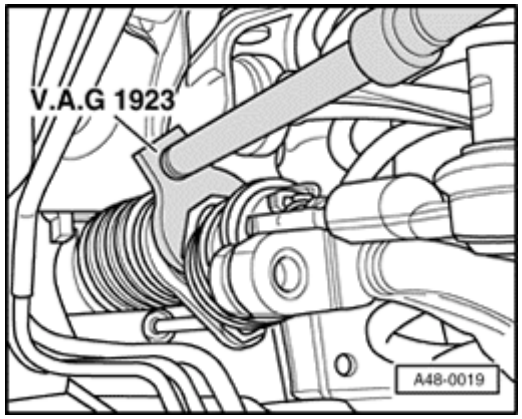


- Remove plastic nut -1-.
- Pry out clips -2-.
- Remove cover for tie rod.



- Open clamps on boot.

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- Move boot outward as far as possible.
- Remove tie rod using VAG1923.

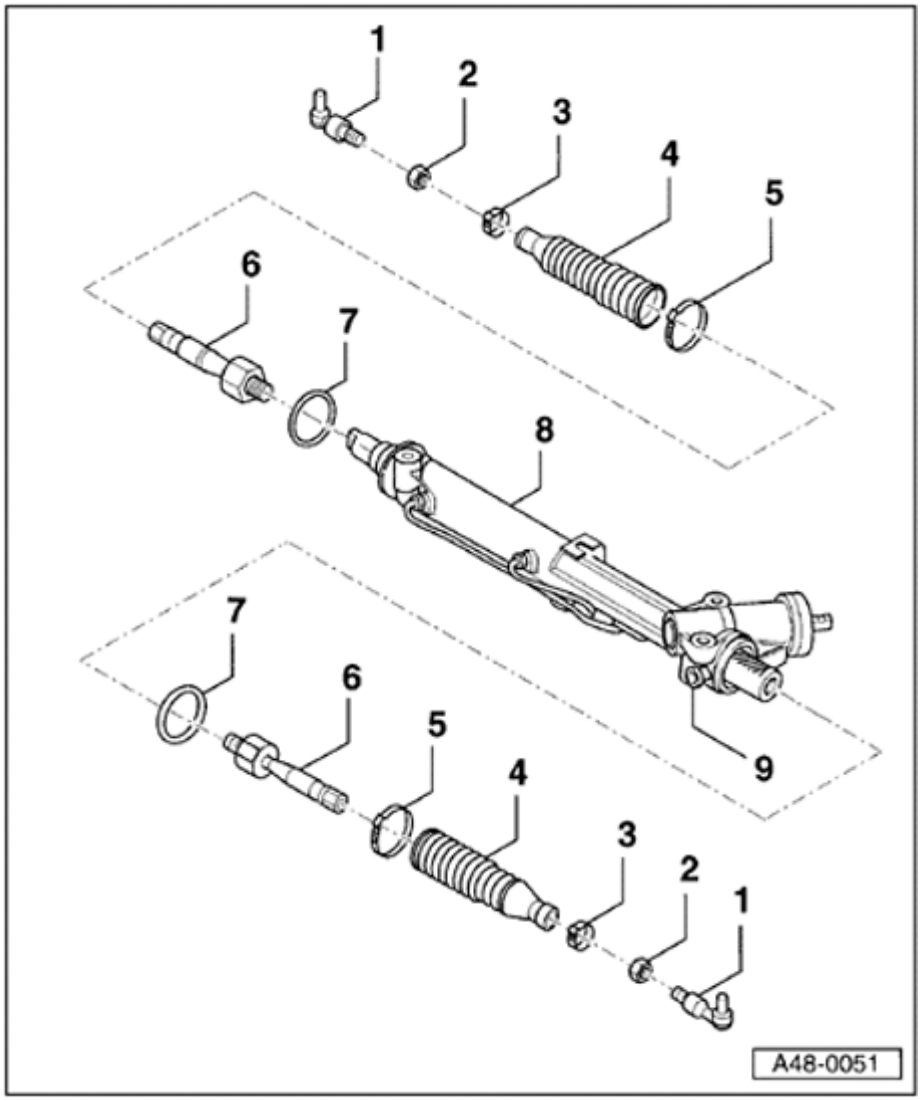
Installing

- Install tie rod.

  Tightening torque: 100 Nm (74 ft lb)
- When installing boot, make sure to check:
  - Smaller diameter of boot clips into groove on tie rod
  - Boot is not twisted
- Replace inner (large) clamp.
- Check wheel alignment ⇒ page 44-6 .

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48-17



Steering gear

Steering gear without dampener (4-cyl. engine), disassembling and assembling

CAUTION!

Do not attempt to weld or straighten the steering gear components.

Notes:

- *Always replace self-locking nuts and bolts.*
- *Only grease the rack with steering gear grease Part No. AOF 063 000 04.*
- *Hydraulic fluid: Part No. G 002 000*

CAUTION!

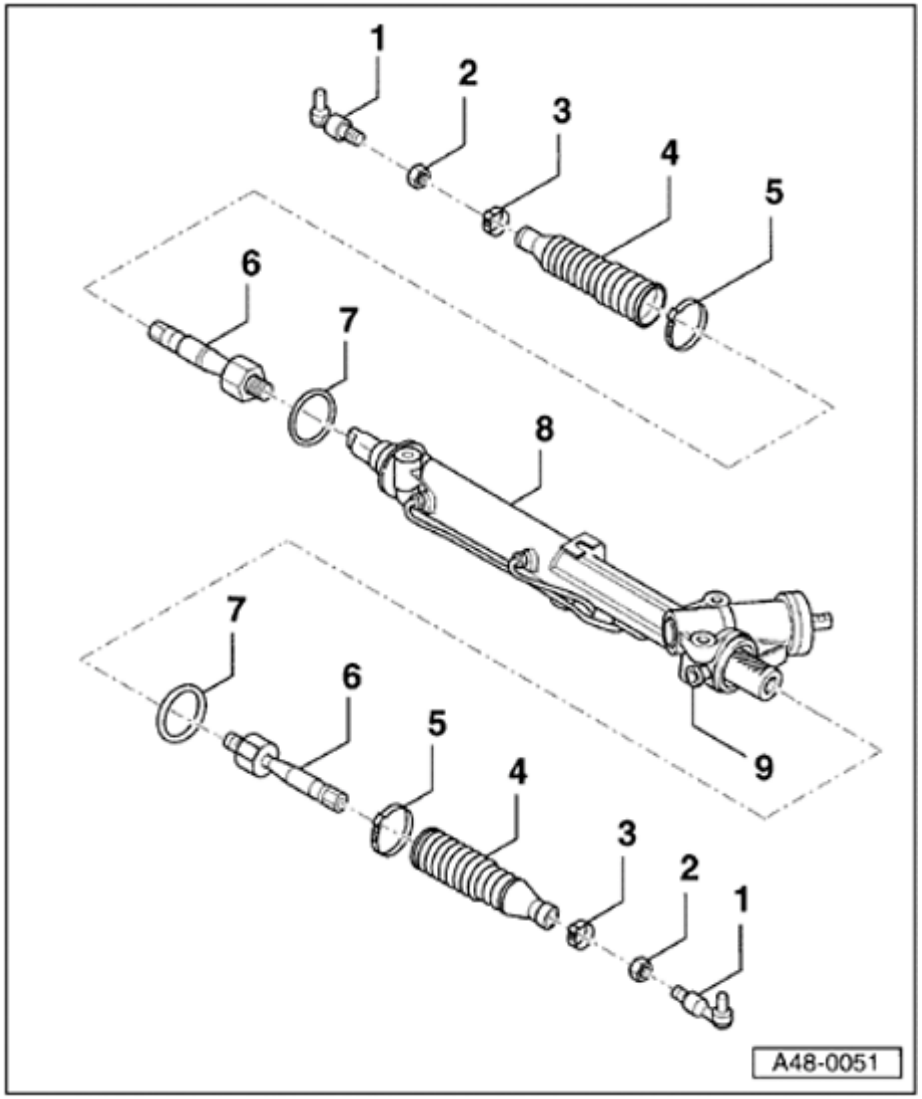
Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

1 - Tie rod end

- Make sure dust caps are seated correctly and not damaged

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48-18



2 - Nut

- 40 Nm (30 ft lb)

3 - Clamp

- Always replace

4 - Boot

- Check for damage
- Can be replaced with steering gear installed
- Must not be twisted after adjusting rack

5 - Clamp

- Always replace
- Tighten using VAG1275

6 - Inner tie rod end

- 100 Nm (74 ft lb)
- Grease joint using steering gear grease A0F 063 000 04

7 - O-ring

- Always replace

8 - Power steering gear

- Grease rack using steering gear grease A0F 063 000 04

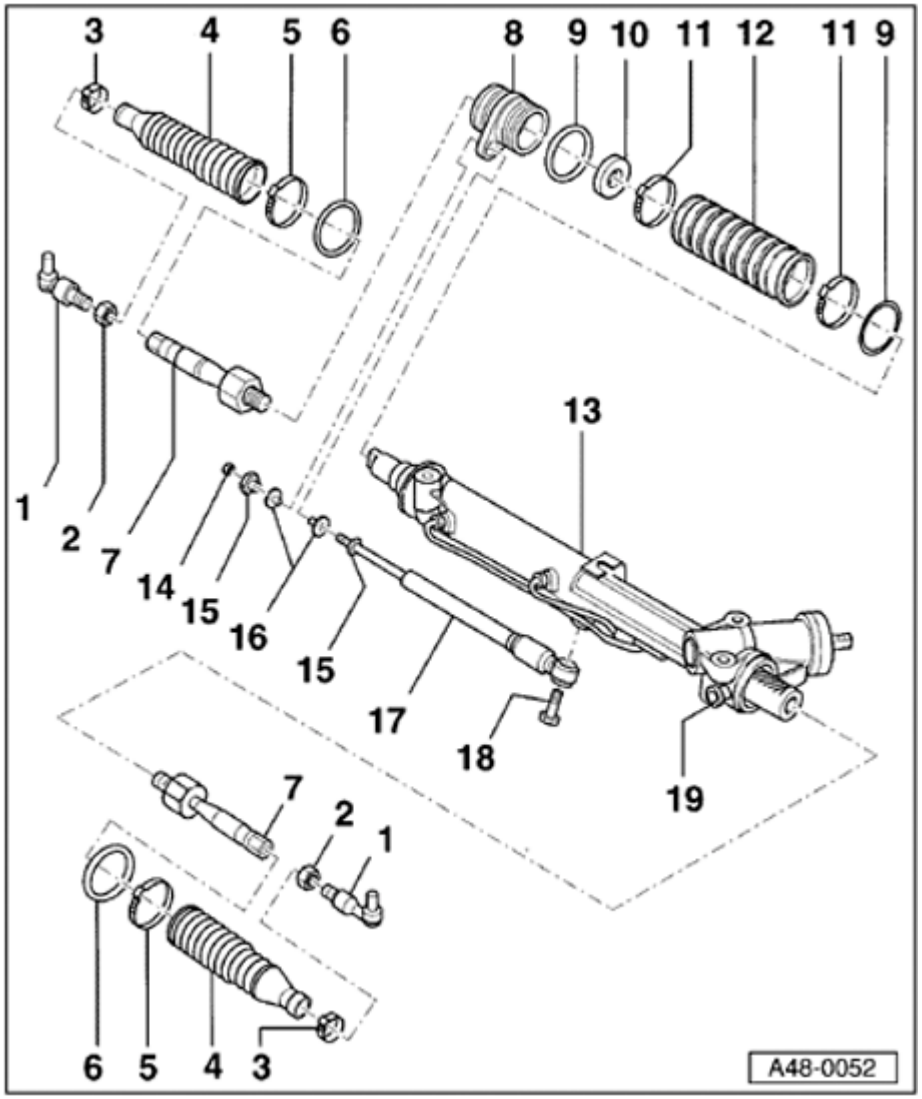
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9 - Screw plug

- 13 Nm (10 ft lb)
- For centering steering

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48-19



Steering gear with dampener (6-cyl. engine), disassembling and assembling

CAUTION!

Do not attempt to weld or straighten the steering gear components.

Notes:

- *Always replace self-locking nuts and bolts.*
- *Only grease the rack with steering gear grease Part No. AOF 063 000 04.*
- *Hydraulic fluid: Part No. G 002 000*

CAUTION!

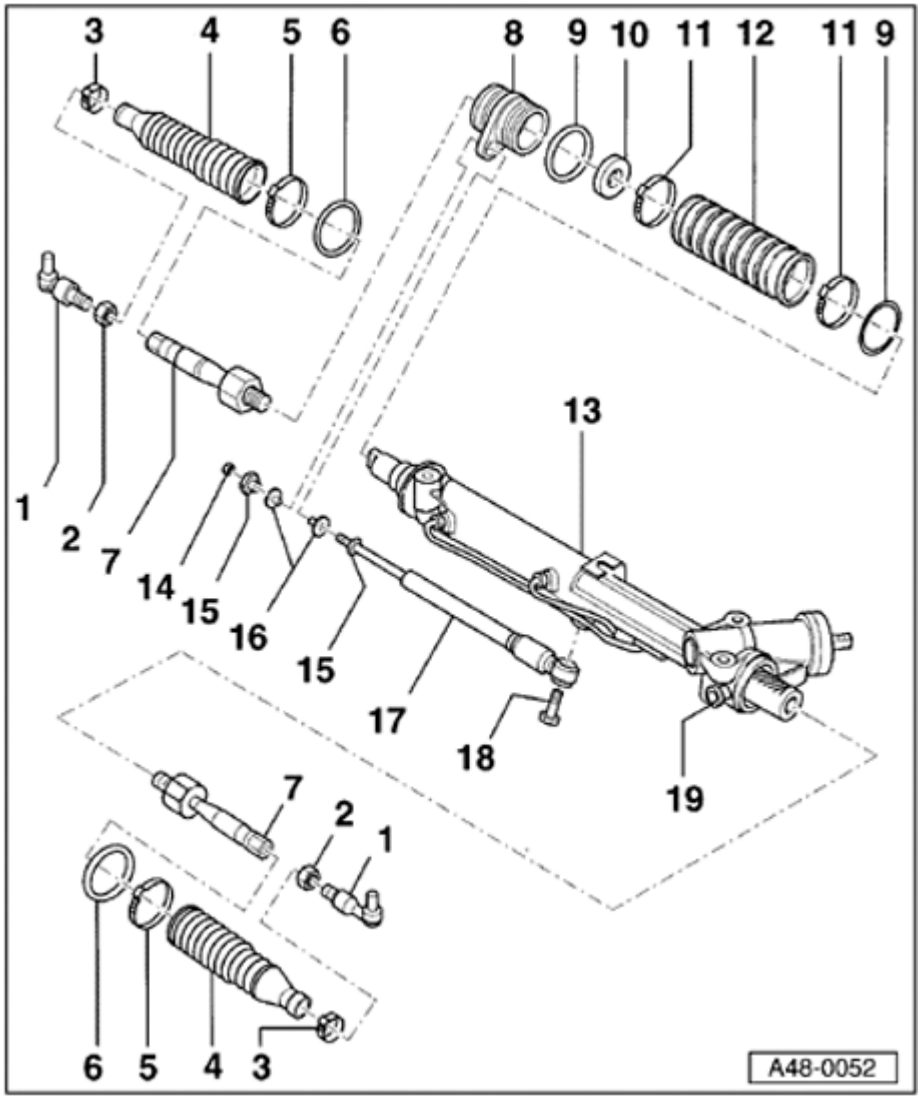
Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

1 - Tie rod end

- Make sure dust caps are seated correctly and not damaged

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48-20



2 - Nut

- 40 Nm (30 ft lb)

3 - Clamp

- Always replace

4 - Boot

- Check for damage
- Can be replaced with steering gear installed
- Must not be twisted after adjusting rack

5 - Clamp

- Always replace
- Tighten using VAG1275

6 - O-ring

- Always replace

7 - Inner tie rod end

- 100 Nm (74 ft lb)
- Grease joint using steering gear grease A0F 063 000 04

8 - Steering damper bracket

9 - O-ring

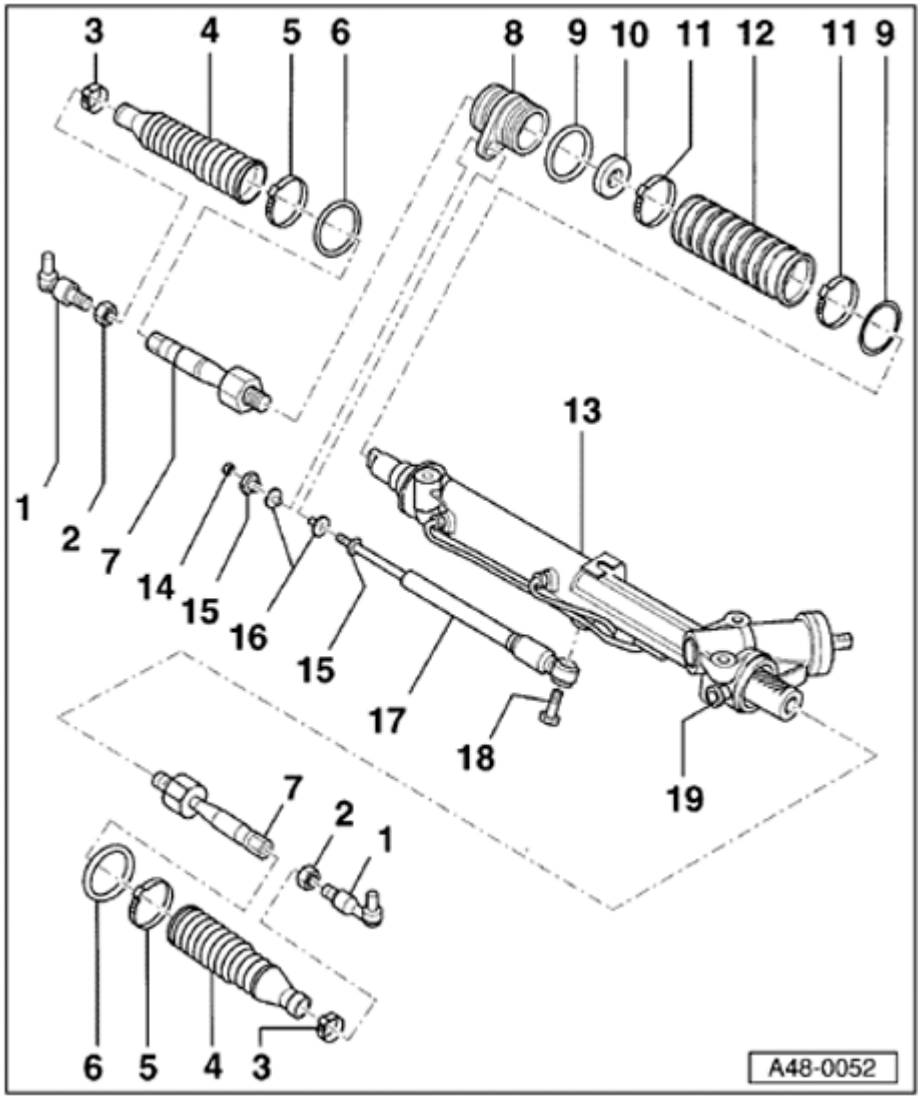
- Always replace

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10 - Dished washer

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48-21



11 - Clamp

- Always replace
- Tighten using VAG1275

12 - Boot

- Check for damage
- Can be replaced with steering gear installed

13 - Power steering gear

- Grease rack using steering gear grease A0F 063 000 04

14 - Nut

- 10 Nm (7 ft lb)
- To loosen and tighten, counter hold on steering damper piston rod hex

15 - Bushing

16 - Rubber bushing

- Two part

17 - Steering damper

18 - Bolt

- 35 Nm (26 ft lb)

19 - Screw plug

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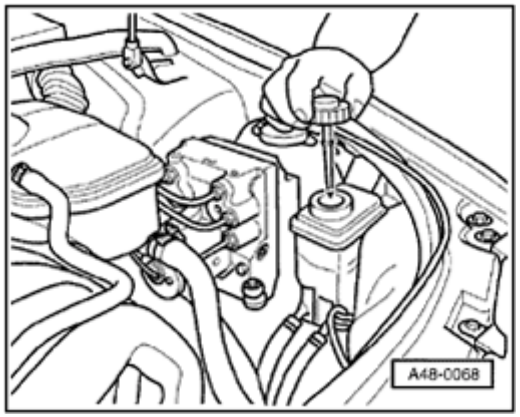
- 13 Nm (10 ft lb)
- For centering steering

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Hydraulic fluid level, checking; steering system, bleeding and checking for leaks

Hydraulic fluid level, checking

- With engine switched off, bring front wheels to straight-ahead position.

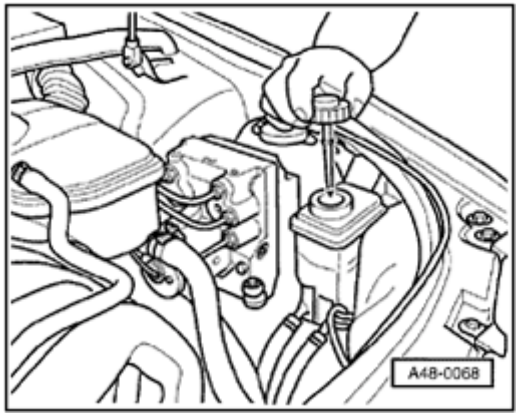


- Remove cap.
- Wipe dipstick using clean cloth.
- Re-install cap hand tight and remove again.

Note:

The cap must be screwed on fully to obtain an accurate fluid level reading.

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Checking with fluid cold

- Fluid level must be in area of "MIN." marking (up to 2 mm (0.08 in.) above or below marking)

Checking with fluid at operating temperature

- Operating temperature: above approx. 50 ° C (122 ° F)
- Fluid level must be between "MIN." and "MAX." markings

Notes:

- *If there is too much fluid in the reservoir, fluid must be extracted.*
- *If there is not enough fluid, it is not sufficient to just top off the fluid; the hydraulic system must also be checked for leaks* ⇒ *page 48-25* .
- *Do not re-use hydraulic fluid that has been removed.*

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Steering system, bleeding

- Check hydraulic fluid level and top off if necessary ⇒ page 48-22 .

- Raise vehicle until front wheels can move freely.

- With engine switched off, turn steering wheel from lock-to-lock 10 times.

- Check hydraulic fluid level and top off if necessary ⇒ page 48-22 .

- Lower vehicle.

- Start engine.

- Turn steering wheel from lock-to-lock 10 times.

- Check hydraulic fluid level and top off if necessary ⇒ page 48-22 .

Any remaining air in steering system will dissipate while driving over the next 10-20 km (6-12 miles).

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Steering system, checking for leaks

- Start engine.

- Turn steering from lock-to-lock and hold briefly.

  This produces maximum possible pressure

CAUTION!

To avoid damaging the pump, do not allow the engine to run for more than 10 seconds (with steering at lock) when carrying out this test.

In this position the following components must be checked for leaks:

- Pinion seal on steering gear valve housing
- All line connections
- Rack seals

- Check rack seals with boots pushed back:

  - Open boot clamp.

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- Push boot back.

- Steering gear must be replaced if fluid is visible in steering gear housing and/or in boot

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48-26

Steering gear, adjusting

Note:

Two technicians are required for the adjustment.

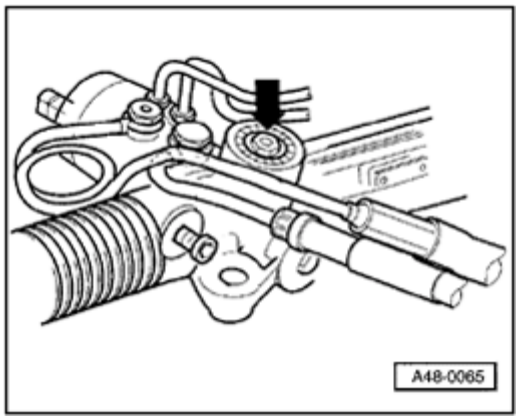
- Engine switched off

- Raise vehicle on hoist.

- Bring wheels to straight-ahead position.

- Turn steering wheel left and right (approx. 30° from center axis).

  Knocking noise will be heard if there is excessive play



- (Second technician) carefully turn adjustment screw (arrow) until knocking noise can no longer be heard from inside vehicle.
- Carry out road test.
- Steering must self-center when maneuvering or negotiating corners, without sticking; re-adjust if necessary.

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Power steering pump, reservoir and hydraulic fluid circuit

Notes:

- *Power steering pumps cannot be repaired. If problems in the pump are suspected carry out pressure and leakage tests. Replace the pump if it is malfunctioning.*
- *Check steering system for leaks if the fluid level in the reservoir is low.*
- *If there are leaks at the line connections first tighten connections, wipe dry and then re-check for leaks.*
- *Checking the hydraulic fluid level* ⇒ *page 48-22* .
- *Bleeding the steering system* ⇒ *page 48-24* .
- *Checking the steering system for leaks* ⇒ *page 48-25* .
- *Type of hydraulic fluid: G 002 000*

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- *Hydraulic system fluid capacity: 0.7-0.9 Liters (12-15 oz.)*

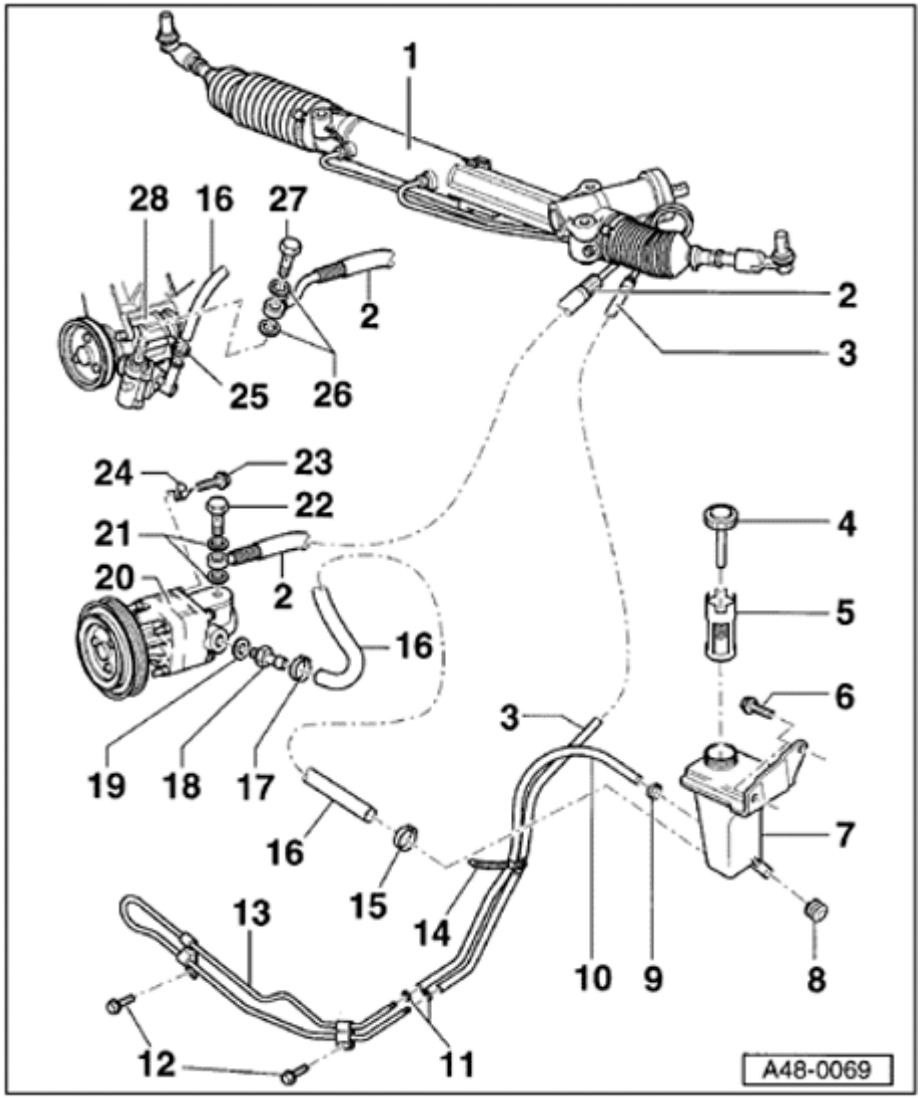
CAUTION!

- ***Pumps supplied as replacement parts are not filled with fluid. Therefore it is essential to fill the pump with hydraulic fluid G 002 000 and to rotate pump several times by hand. Otherwise the pump may be damaged or be noisy during operation.***

- ***Part numbers are listed here for reference only. Always check with your Parts department for the latest information.***

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48-28



Power steering hydraulic circuit (4-cyl. engine), overview

1 - Power steering gear

2 - Pressure line

3 - Return hose

4 - Cap with dipstick

- Checking fluid level ⇒ page 48-22

5 - Strainer

- Integrated into reservoir

6 - Bolt

- 9 Nm (80 in. lb)

7 - Reservoir

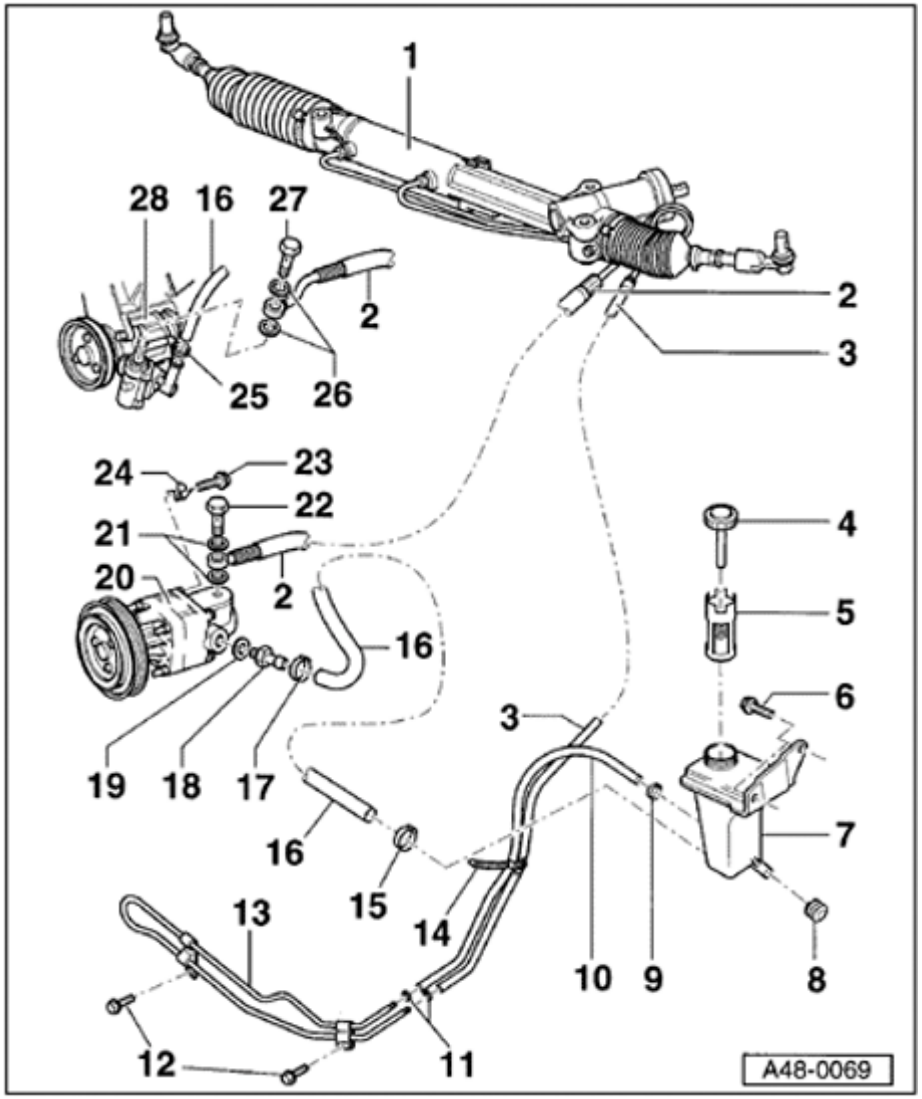
8 - Rubber mount

9 - Clamp

- Use VAG1275 to tighten

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48-29



10 - Return hose

- Between reservoir and cooling line
- Not on 4-cyl. TDI without towing hitch

11 - Clamps

- Use VAG1275 to tighten

12 - Bolts

- 10 Nm (7 ft lb)

13 - Cooling line

- Not on 4-cyl. TDI without towing hitch

14 - Cable strap

15 - Clamp

- Use VAG1275 to tighten

16 - Suction hose

17 - Clamp

- Use VAG1275 to tighten

18 - Hose fitting

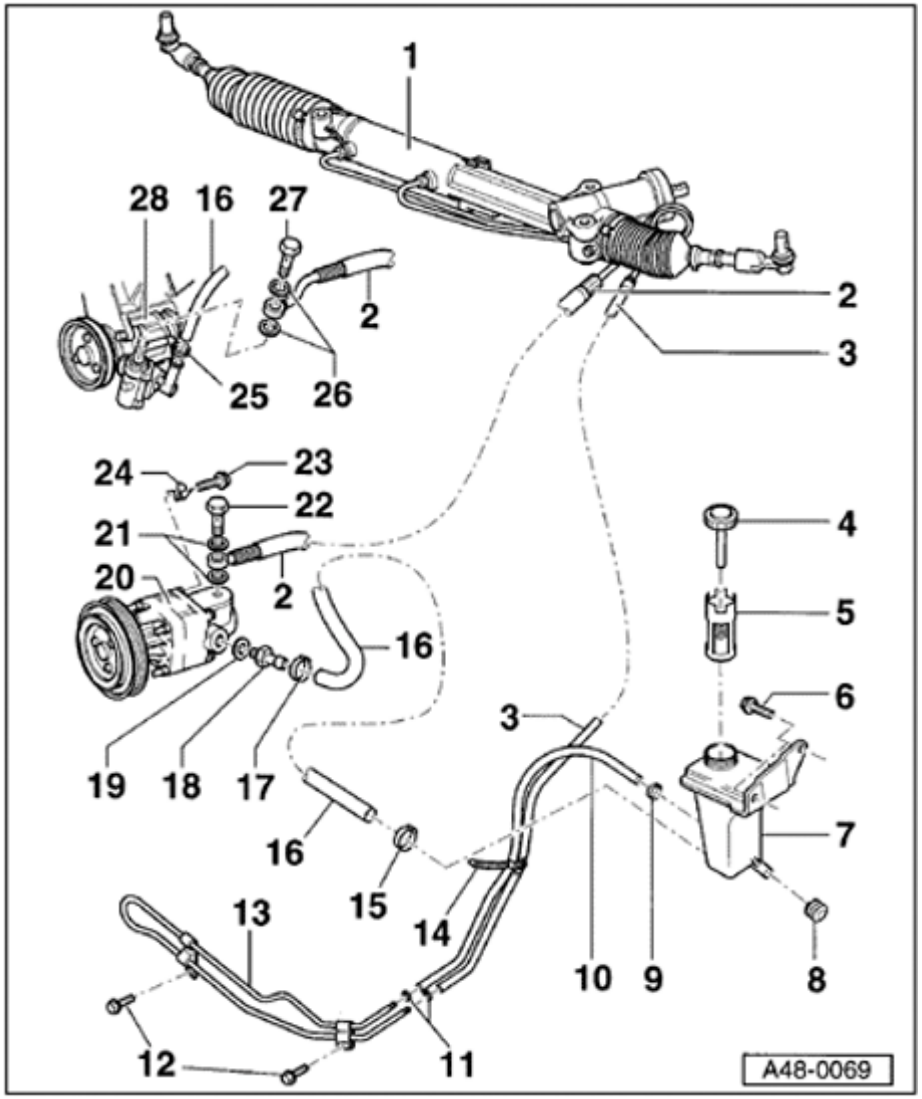
- 50 Nm (37 ft lb)

19 - Seals 18 x 24

- Always replace

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48-30



20 - Power steering pump

- Fill with fluid before installing ⇒ CAUTION, page 48-27

21 - Seals 16 x 22

- Always replace

22 - Banjo bolt

- 50 Nm (37 ft lb)

23 - Bolt

- 18 Nm (13 ft lb)

24 - Fastener

25 - Clamp

- Always replace
- Use VAG1275 to tighten

26 - Seals 16 x 22

- Always replace

27 - Banjo bolt

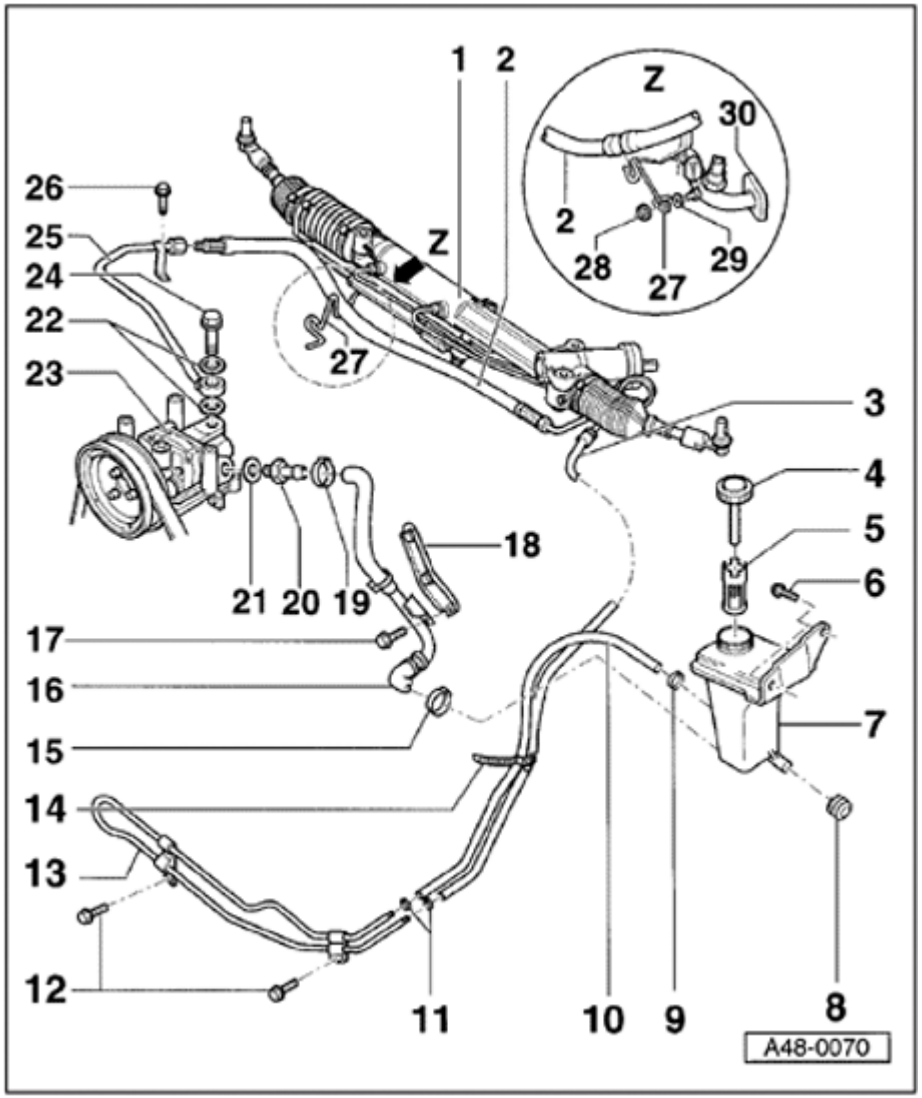
- 50 Nm (37 ft lb)

28 - Power steering pump

- Fill with fluid before installing ⇒ CAUTION, page 48-27
- Installed on all 4-cyl. engines m.y. 98 ➢

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48-31



Power steering hydraulic circuit (6-cyl. 2V engine), overview

1 - Power steering gear

2 - Flexible hose

3 - Return hose

4 - Cap with dipstick

- Checking hydraulic fluid level ⇒ page 48-22

5 - Strainer for expansion tank

- Integrated into reservoir

6 - Bolt

- 9 Nm (80 in. lb)

7 - Expansion tank

- Refill with hydraulic fluid, Part No. G 002 000
- Capacity: 0.7 liters (12 oz.)
- Checking hydraulic fluid level ⇒ page 48-22

8 - Rubber mount

9 - Clamp

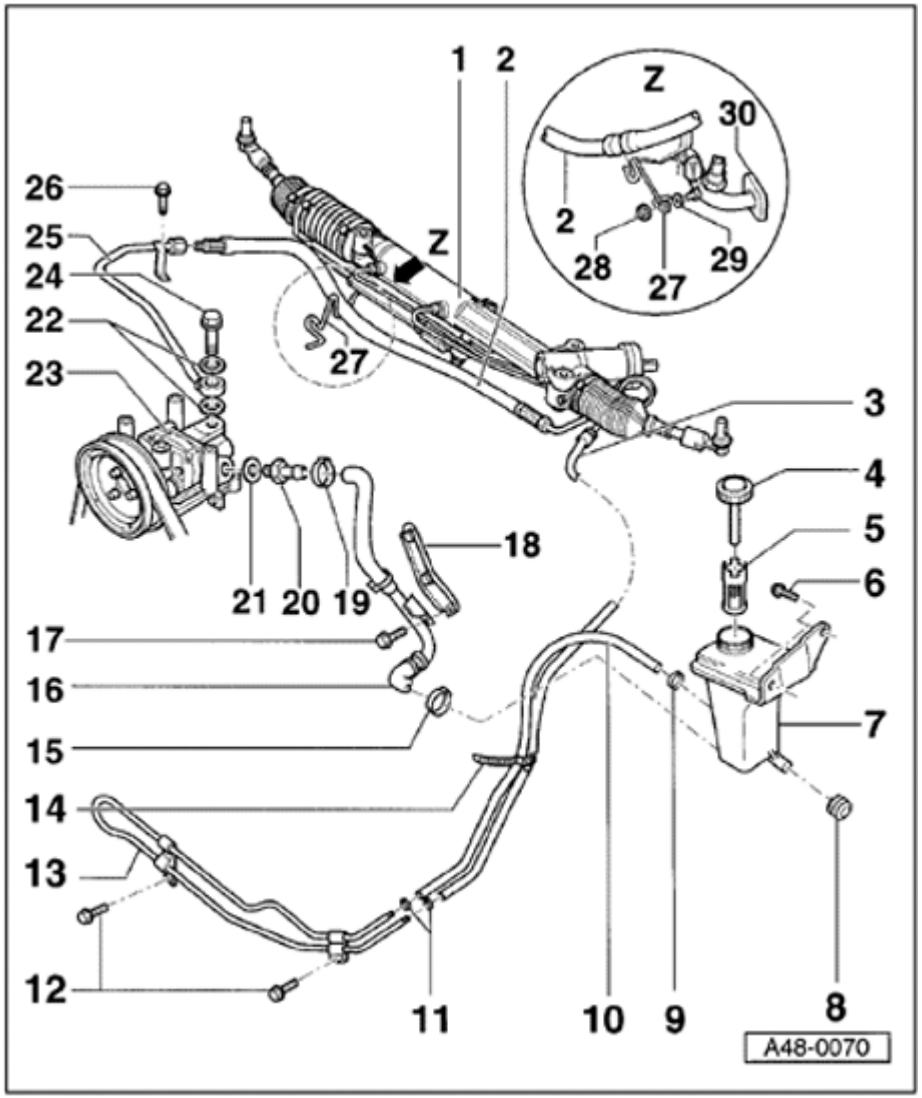
- Always replace

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- Use VAG1275 to tighten

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48-32



10 - Return hose

- Between expansion tank and oil cooler

11 - Clamps

- Always replace
- Use VAG1275 to tighten

12 - Bolt w/washer assembly

- 10 Nm (7 ft lb)

13 - Cooling line

14 - Cable strap

15 - Clamp

- Always replace
- Use VAG1275 to tighten

16 - Suction hose

17 - Bolt w/washer assembly

- 8 Nm (71 in. lb)

18 - Bracket

- Bolted to cylinder head

19 - Clamp

- Always replace
- Use VAG1275 to tighten

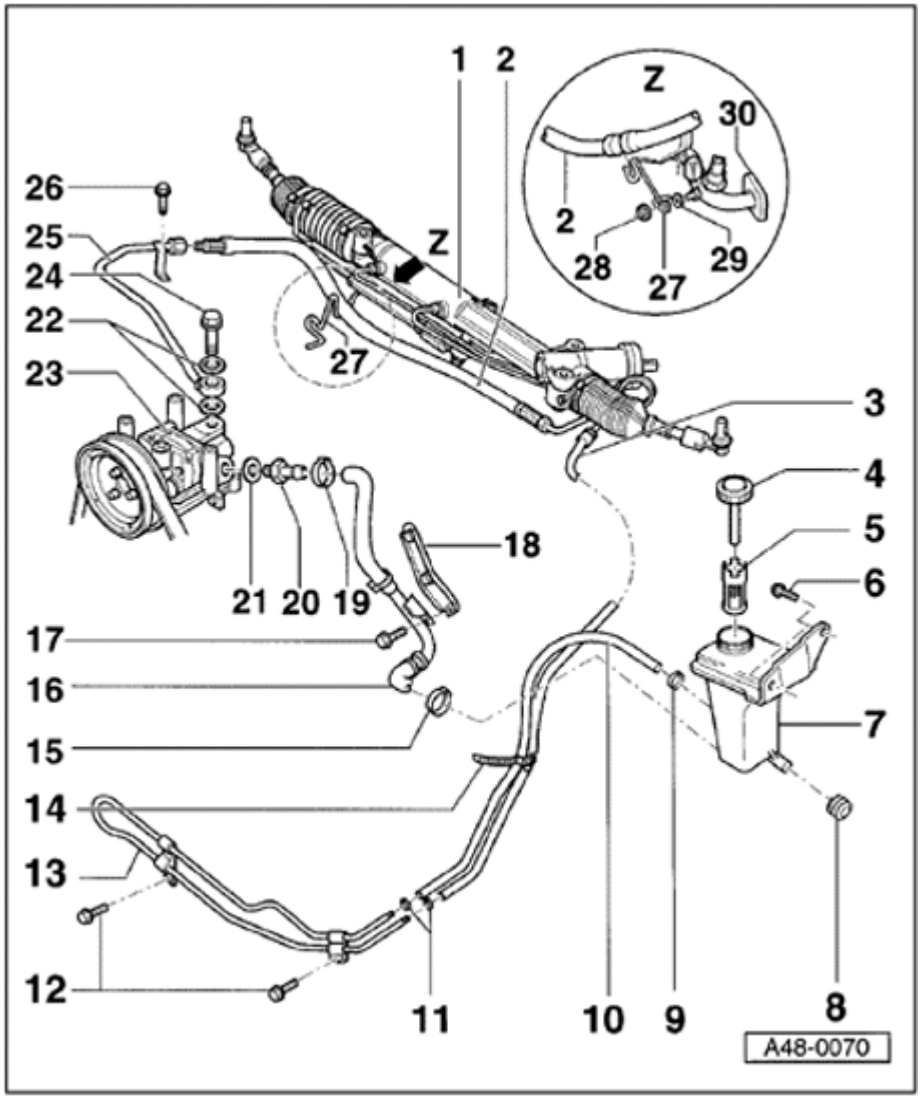
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20 - Hose fitting

- 50 Nm (37 ft lb)

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48-33



21 - Seal 18 x 24

- Always replace

22 - Seal 16 x 22

- Always replace

23 - Power steering pump

- Fill with fluid before installing ⇒ CAUTION, page 48-27

24 - Banjo bolt

- 50 Nm (37 ft lb)

25 - Supply line

- 40 Nm (30 ft lb)
- Counter-hold at hex on flexible hose when tightening fitting
- Mounted to intake manifold with bolt - 26 -

26 - Bolt

- 8 Nm (71 in. lb)

27 - Clip

28 - Nut

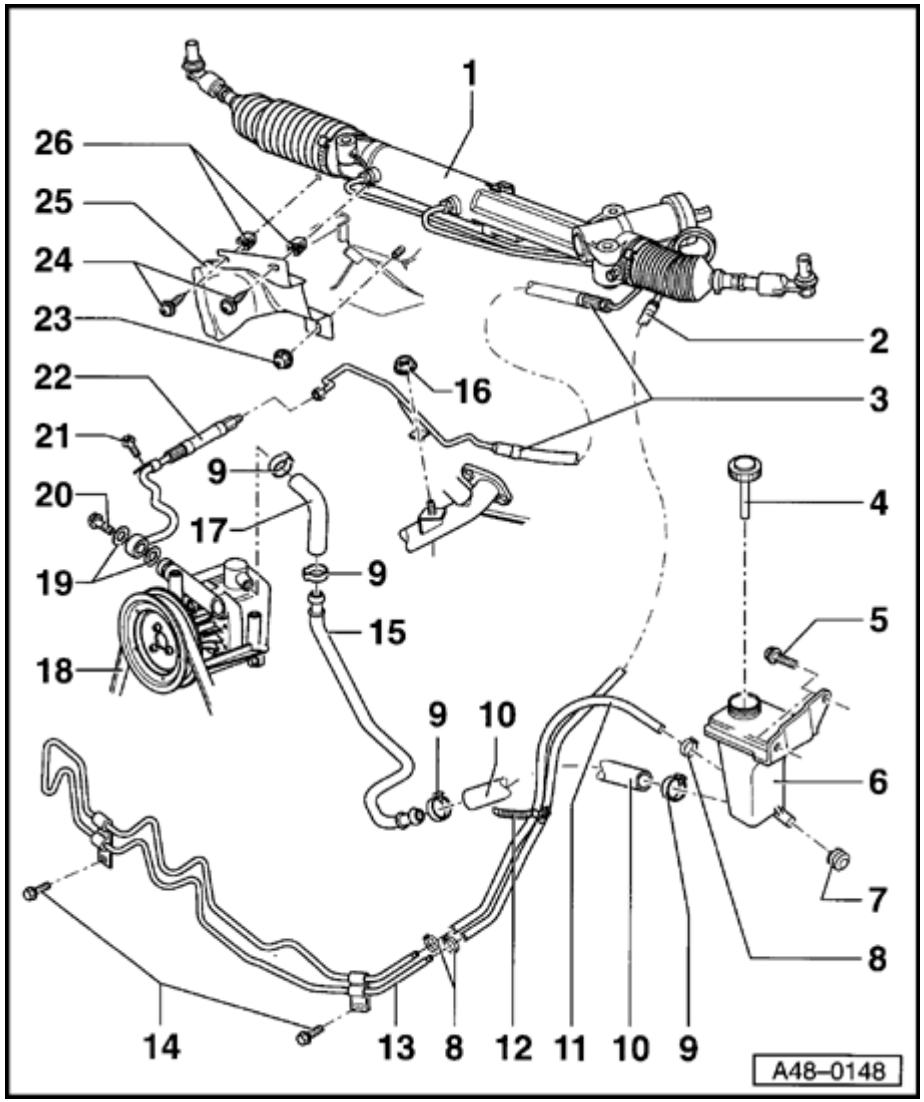
- 20 Nm (15 ft lb)

29 - Washer

30 - Coolant line

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48-34



Power steering hydraulic circuit (6-cyl. 5V engine), overview

Power steering pump model 4 (FP-4)

1 - Power steering gear

2 - Return hose

3 - Pressure hose

4 - Cap with dipstick

- Checking hydraulic fluid level ⇒ page 48-22

5 - Bolt

- 9 Nm (80 in. lb)

6 - Reservoir

7 - Rubber mount

8 - Clamp

- Use VAG1275 to tighten

9 - Clamp

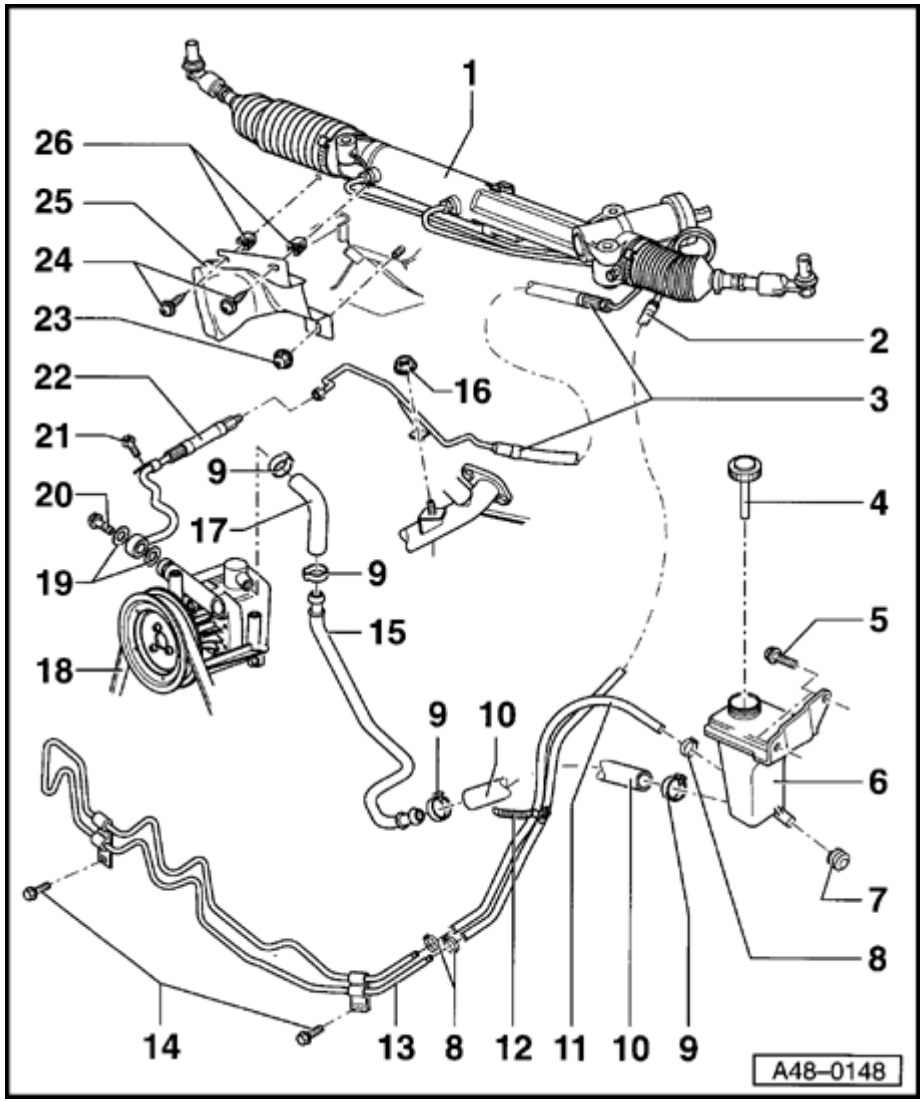
- Use VAG1275 to tighten

10 - Suction hose

- Fitting location ⇒ Fig. 2
- Marks must align

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48-35



11 - Return hose

- Between reservoir and cooling line

12 - Cable strap

13 - Cooling line

14 - Torx® bolts (T-30)

- 9 Nm (80 in. lb)

15 - Line

- Marks must align with mark on suction hose

16 - Nut

- 20 Nm (15 ft lb)
- For attaching pressure hose to cooling line

17 - Suction hose

- Marking -P- faces pump

18 - Ribbed belt

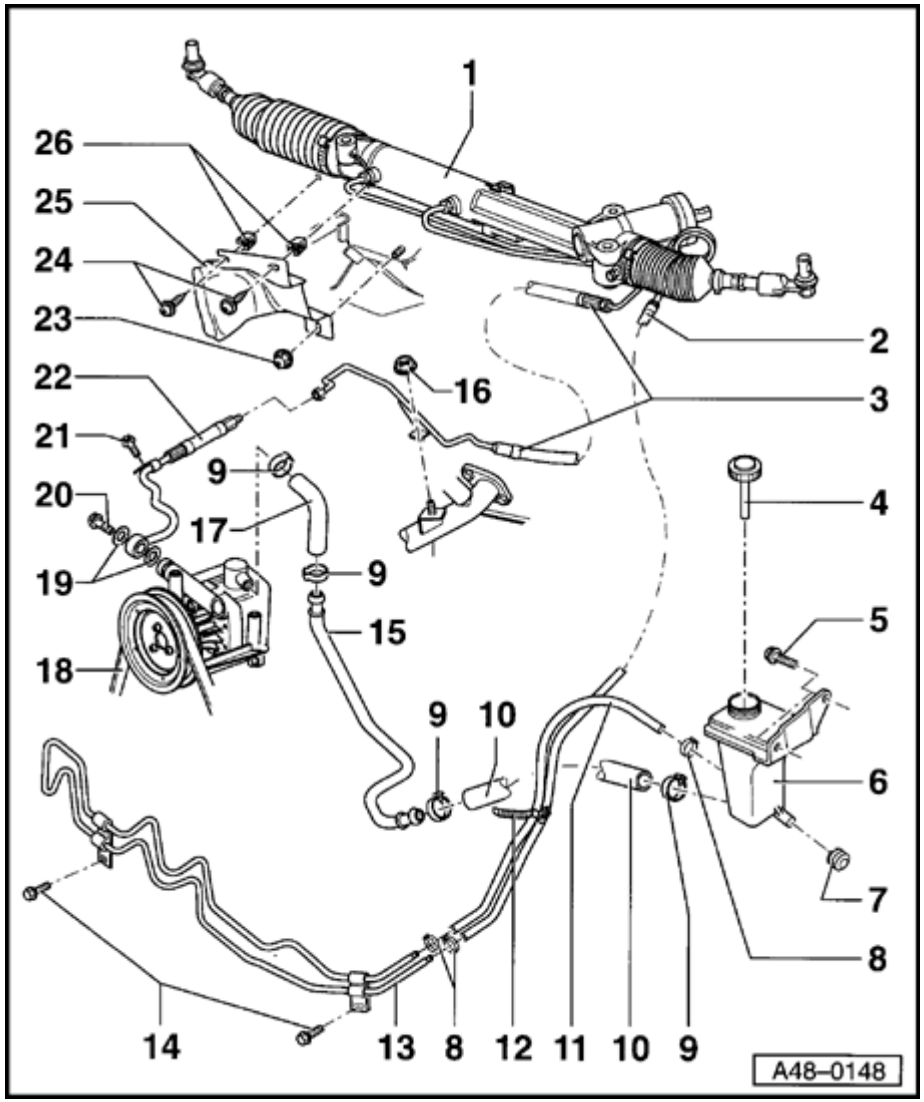
- Mark running direction before removing

CAUTION!

Mark the running direction before removing. Reinstalling a used belt in reversed running direction could damage the belt.

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48-36



19 - Seal 16 x 22

- Always replace

20 - Banjo bolt

- 50 Nm (37 ft lb)

21 - Bolt

- 6 Nm (53 in. lb)

22 - Pressure hose

23 - Speed nut

24 - Combi-bolt

25 - Guard plate

26 - Expanding nuts

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48-37

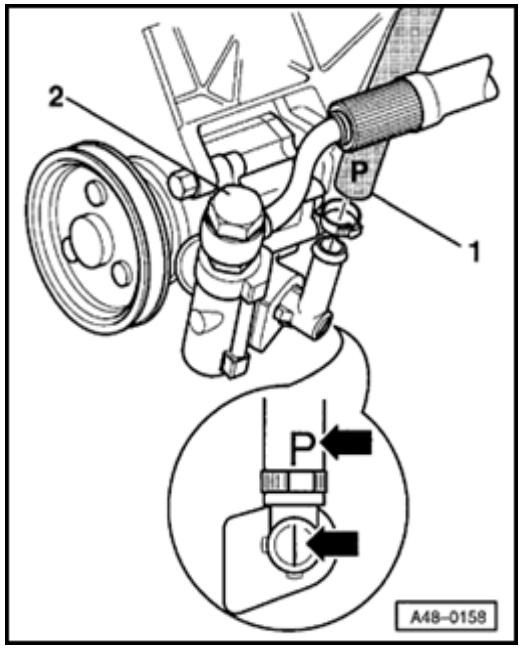


Fig. 1 Fitting location of suction hose at power steering pump (4-cyl. and V6 TDI engines)

- Mark -P- on suction hose must align with seam on pump

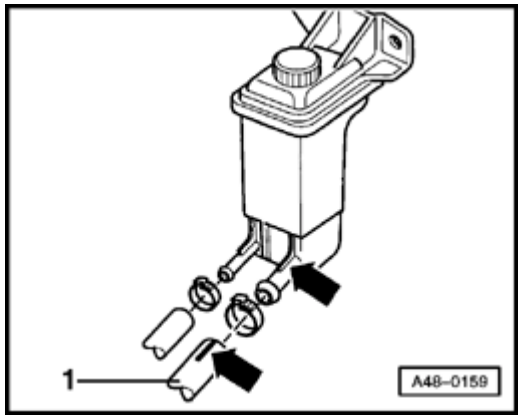


Fig. 2 Fitting location of suction hose at reservoir (all engines)

- Mark -1- on suction hose must align with seam on reservoir

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Power steering pump, testing delivery

Power steering pump (4-cyl. engine), testing delivery

Special tools, test equipment and auxiliary items

- VAG1402
- VAG1402/3 adaptor
- 3094 hose clamps

Testing delivery

- Pinch off suction and return lines using 3094 hose clamps.
- Disconnect pressure line from power steering pump.
- Screw VAG1402/3 adapter into power steering pump in place of banjo bolt.
- Close pressure guage shutoff valve (lever set to left).

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- Remove 3094 hose clamps.

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- Start engine and top off fluid in reservoir (if necessary).

- Measure pressure reading at idle speed:

  - Do not measure for longer than 10 seconds

  - Specified value: 110-120 bar (1595-1740 psi)

If specified value is not attained:

- Replace power steering pump ⇒ page 48-56 .

  - Check hydraulic fluid level ⇒ page 48-22 .

  - Check steering system for leaks ⇒ page 48-25 .

  - Bleed steering system ⇒ page 48-24 .

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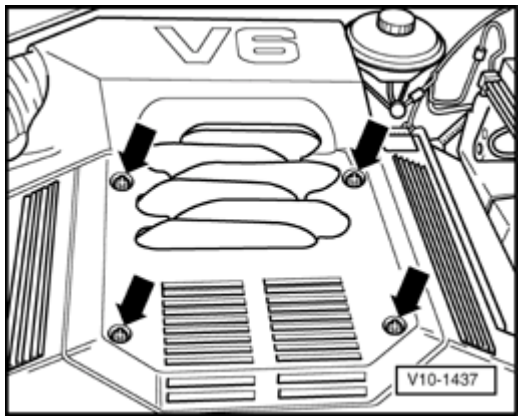
48-40

Power steering pump (6-cyl. engine), testing delivery

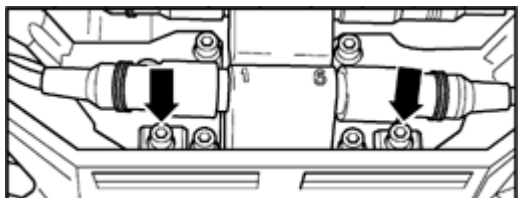
Special tools, test equipment and auxiliary items

- VAG1402
- VAG1402/3 adaptor
- 3094 hose clamp

Models with 6-cylinder engine



- Unclip top engine cover and remove.

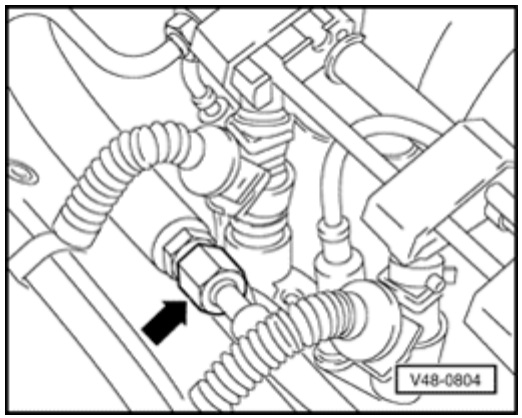


- Unbolt ribbed belt cover.

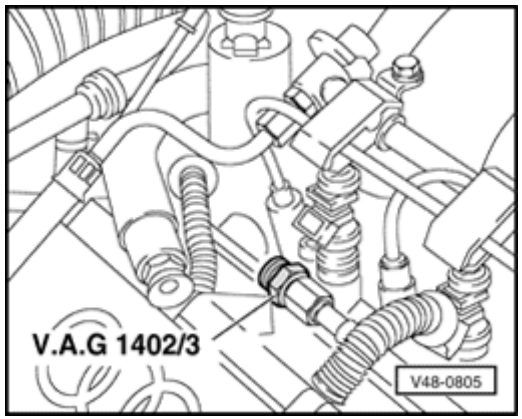
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48-41

- Pinch off suction hose using 3094 hose clamp.



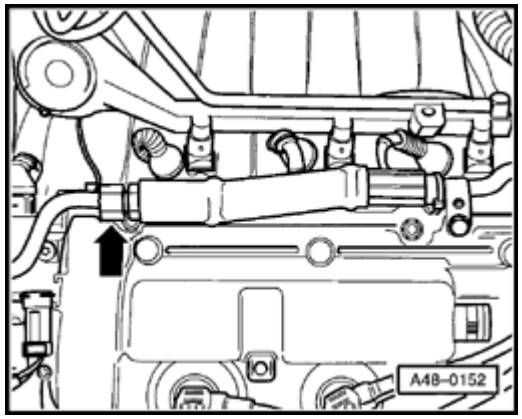
- Press spring clip and disconnect harness connector from fuel injector.
- Counter-hold at hex on flexible hose and remove supply line from flexible hose (arrow).



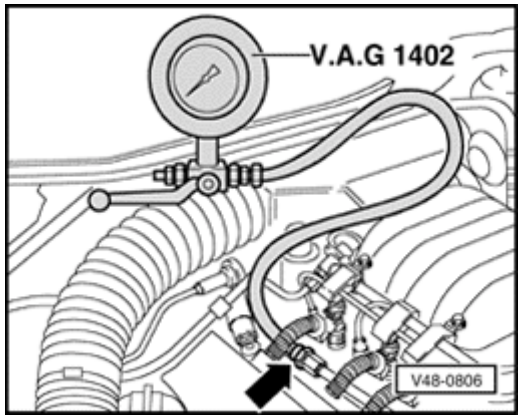
- On vehicles with V6 2V engine: screw VAG1402/3 adapter into power steering pump in place of flexible hose.

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48-42



- On vehicles with V6 5V engine: counter-hold at hex on flexible hose and remove supply line from flexible hose (arrow).
- Screw VAG1402 pressure gauge hose to expansion hose.



- Screw VAG1402 pressure gauge hose to VAG1402/3 adapter.
- Close pressure gauge shut-off valve (lever positioned toward left).
- Reconnect fuel injector harness connector.
- Remove hose clamp from suction hose.
- Start engine and top off reservoir (if necessary).
- With engine idling, read power steering pump pressure on gauge.
  - Do not measure for longer than 10 seconds
  - Specified value: 110-120 bar (1595-1740 psi)

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48-43

If specified value is not attained:

- Replace power steering pump ⇒ page 48-56 .

  - Check hydraulic fluid level ⇒ page 48-22 .

  - Check steering system for leaks ⇒ page 48-25 .

  - Bleed steering system ⇒ page 48-24 .

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Power steering pump, removing and installing

Notes:

- *Power steering pumps cannot be repaired. If problems in the pump are suspected carry out pressure and leakage tests. Replace the pump if it is malfunctioning.*
- *Check steering system for leaks if the fluid level in the reservoir is low.*
- *If there are leaks at the line connections first tighten connections, wipe dry and then re-check for leaks.*
- *Checking the hydraulic fluid level* ⇒ *page 48-22* .
- *Bleeding the steering system* ⇒ *page 48-24* .
- *Checking the steering system for leaks* ⇒ *page 48-25* .
- *Type of hydraulic fluid: G 002 000*
- *Hydraulic system fluid capacity: 0.7-0.9 Liters*

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(12-15 oz.)

CAUTION!

- ***Pumps supplied as replacement parts are not filled with fluid. Therefore it is essential to fill the pump with hydraulic fluid G 002 000 and to rotate pump several times by hand. Otherwise the pump may be damaged or be noisy during operation.***

- ***Part numbers are listed here for reference only. Always check with your Parts department for the latest information.***

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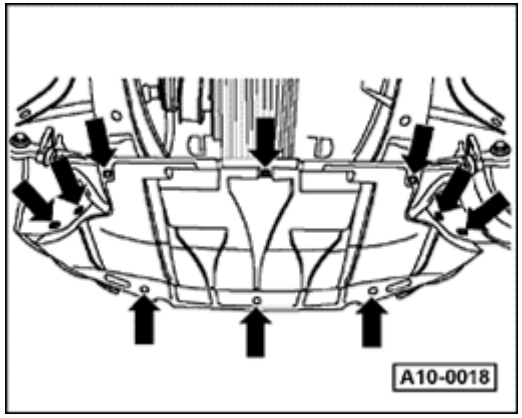
48-45

Power steering pump (4-cyl. engine), removing and installing

Special tools, test equipment and auxiliary items

3204	3369	3094
VAG1590		
Repair Manual, Body Exterior		
Repair Manual, Body Interior		
Repair Manual, Engine Mechanical		

Removing



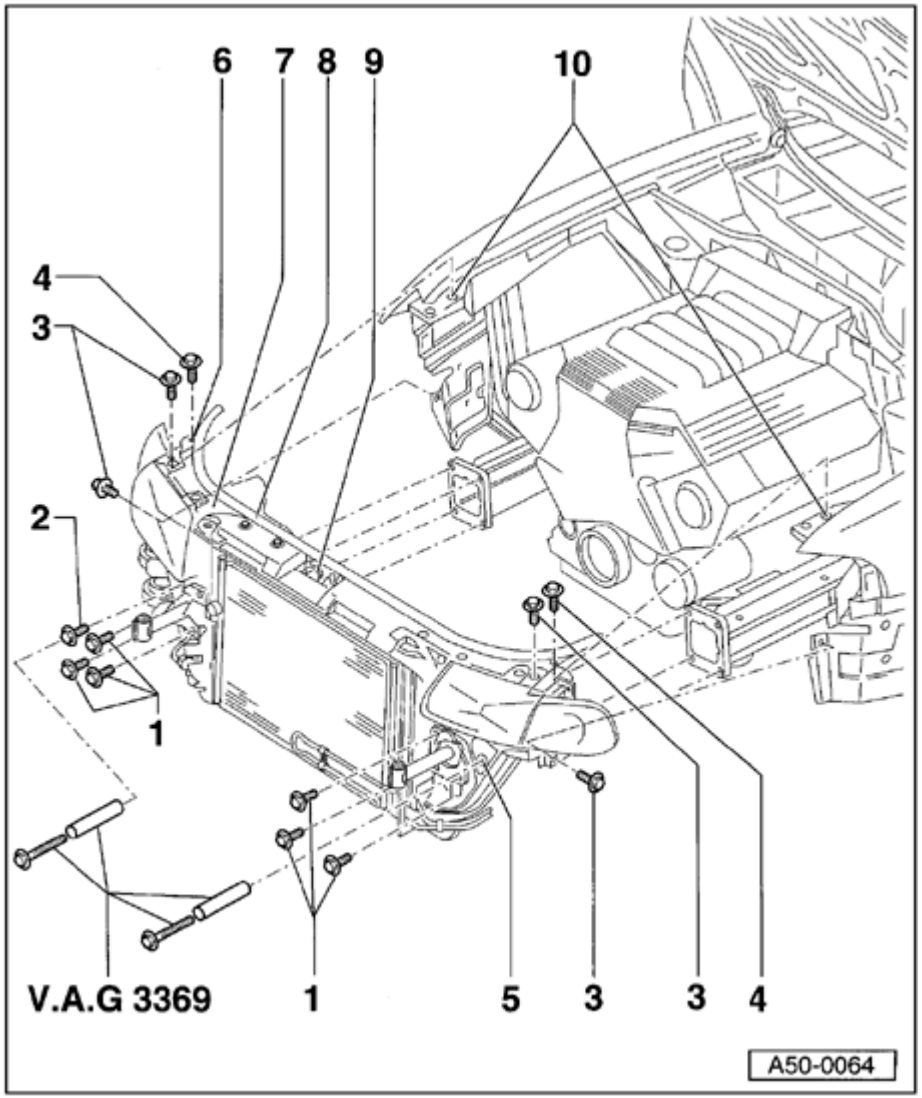
- Remove noise insulation panel.
- Remove front bumper:

⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Move lock carrier to service position ⇒ page 48-46 .

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48-46



Lock carrier, moving to service position

1 - Bolt (6x)

- 50 Nm (37 ft lb)

2 - Bolt

- 50 Nm (37 ft lb)

3 - Bolts (4x)

- 8 Nm (71 in. lb)

4 - Bolts (2x)

- 8 Nm (71 in. lb)

5 - Access hole for 3369 support tool

6 - Hole in front end

- For securing lock carrier in service position

7 - Lock carrier

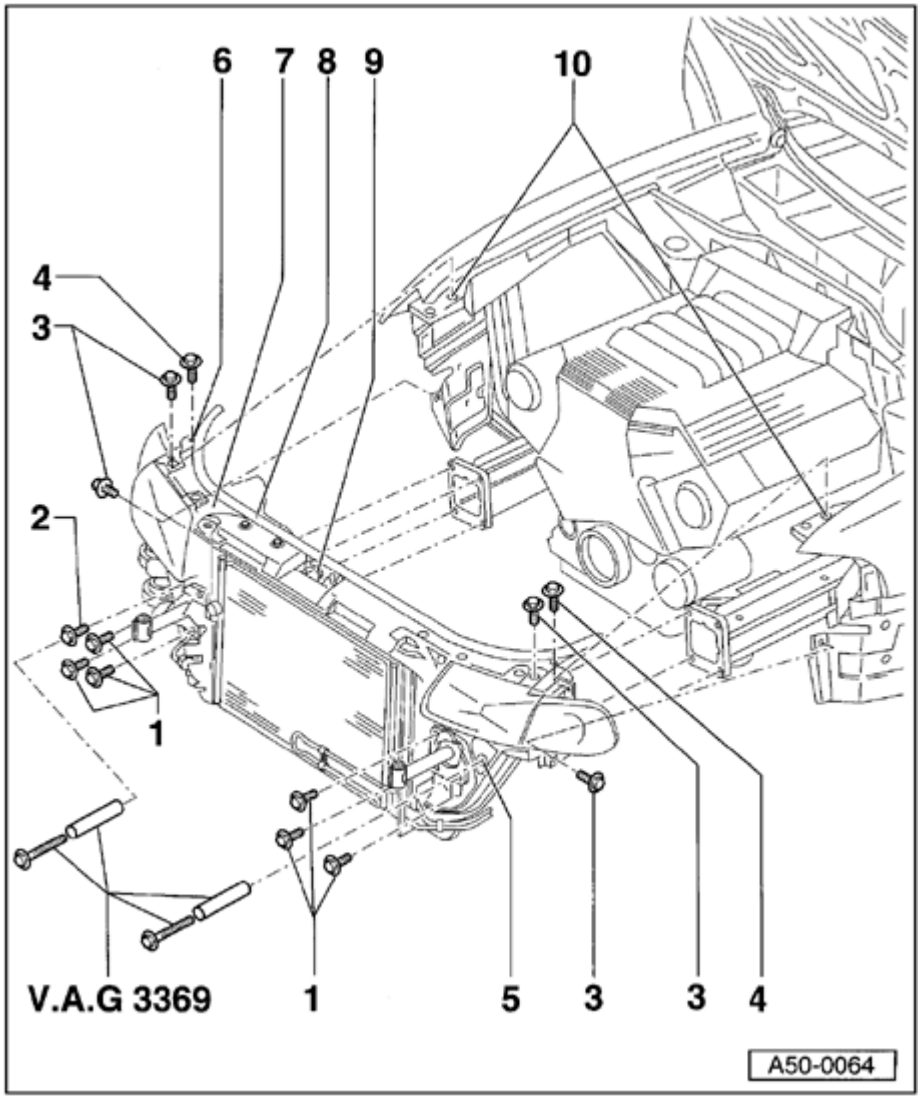
8 - Weather stripping for hood

9 - Bowden cable for hood

10 - Holes in side panel

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48-47



Moving to service position

- Remove front bumper:

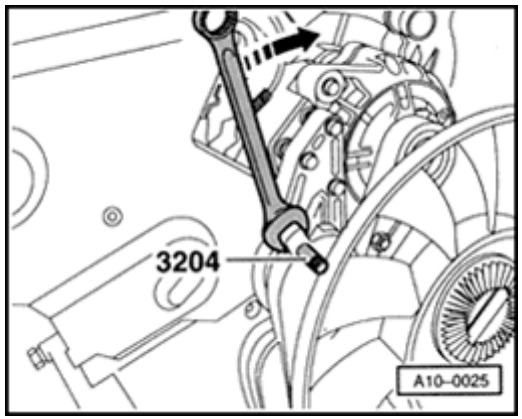
⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Remove intake air duct located between lock carrier and air cleaner.
- Remove bolt - 2 - and install 3369 support tool on left and right-hand sides.
- Remove bolts - 1 -, - 3 - and - 4 - then pull lock carrier forward on 3369 support tool.

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48-48

Removing ribbed belt on vehicles with 4-cyl. gasoline engine

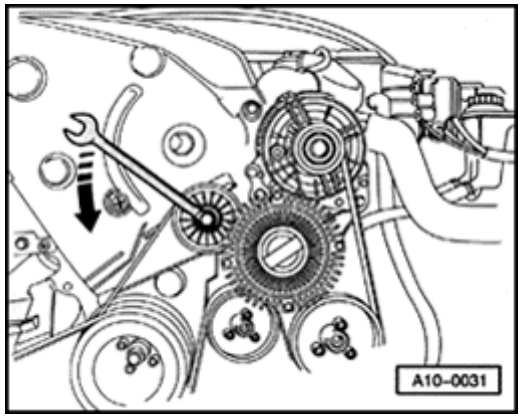


- Move tensioner in direction of arrow to loosen ribbed belt.
- Secure using 3204 drift.

CAUTION!

Mark the running direction before removing. Reinstalling a used belt in reversed running direction could damage the belt.

Removing ribbed belt on vehicles with 4-cyl. Diesel engine



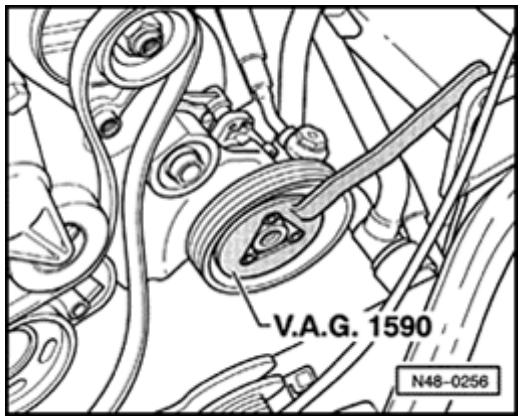
- Move tensioner in direction of arrow to loosen ribbed belt.

CAUTION!

Mark the running direction before removing. Reinstalling a used belt in reversed running direction could damage the belt.

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48-49



Removing power steering pump pulley (vehicles with 4-cyl. gasoline engine)

- Remove coolant pump pulley.
- Remove ribbed belt.

CAUTION!

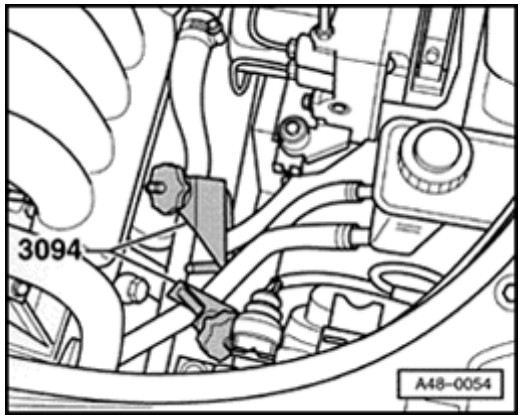
Mark the running direction before removing. Reinstalling a used belt in reversed running direction could damage the belt.

- Remove power steering pump pulley.
  - If necessary, file down corners of VAG1590 water pump wrench.

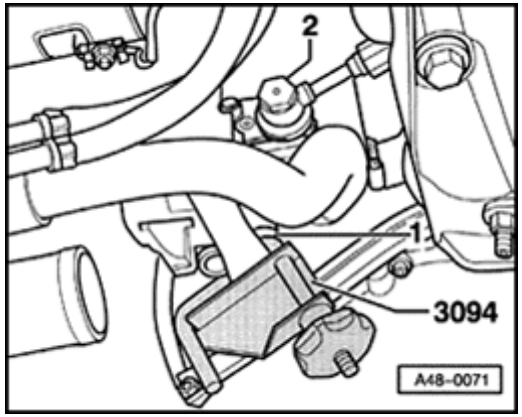
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48-50

Removing power steering pump (all engines)



- Using 3094 hose clamps, pinch off suction and return hoses.
- Place oil catch pan in position.

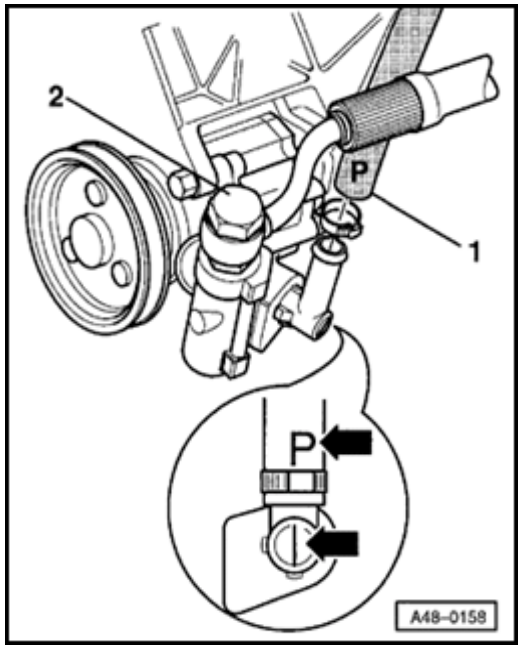


- Remove hose clamp -1- from suction hose.
- Remove suction hose, press out of retainer and lay to side.
- Remove pressure line -2-.

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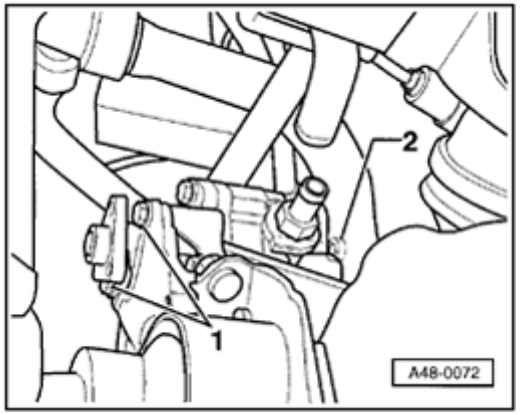
48-51

Removing power steering pump (power steering pump FP-4) m.y. 1997 >



<

- Remove hose clamp from suction hose -1-.
- Remove suction hose and lay to side.
- Remove expansion hose -2-.



<

- Remove bolts -1- and socket-head bolt -2-.
- Remove pump.

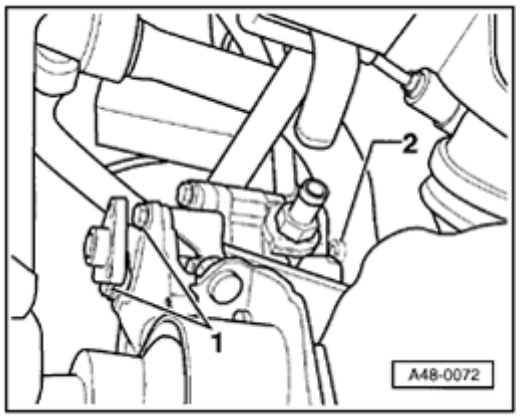
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48-52

Installing

Installation note:

Before installing a new power steering pump, add hydraulic fluid to the suction end and turn the pump by hand until fluid emerges from the discharge end.

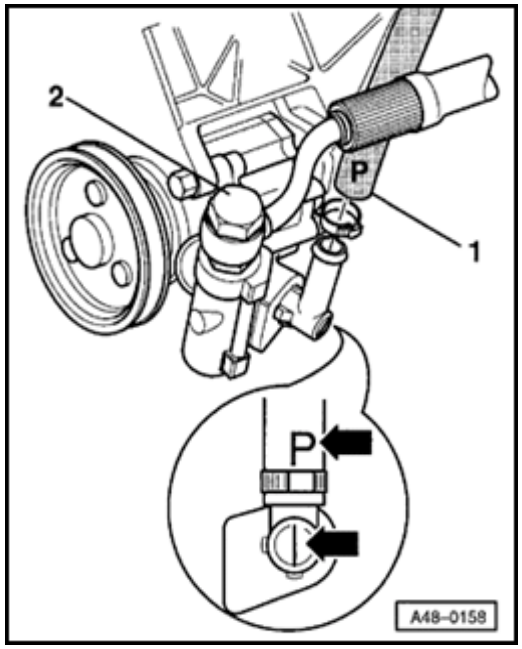


- Turn pump by hand until fluid emerges from discharge end.
- Tighten bolts -1- and -2-.

  Tightening torque: 20 Nm (15 ft lb)

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48-53

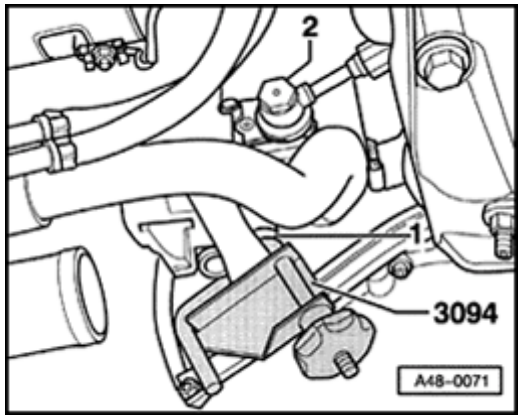


Installing power steering pump (power steering pump FP-4) m.y. 1997

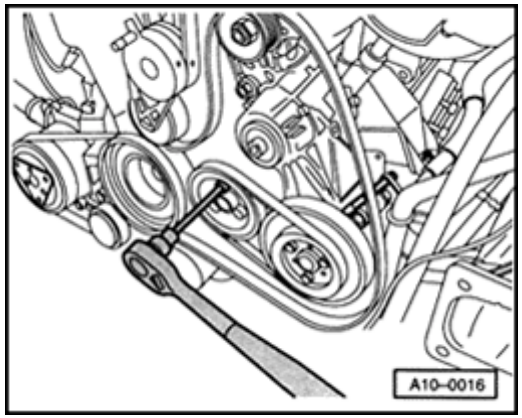
- Install pressure line and tighten banjo bolt -2-.
  - ♦ Always replace seals
  - ♦ Tightening torque: 50 Nm (37 ft lb)
- Install suction hose -1-.
- Mark -P- (upper arrow) must align with seam on pump (lower arrow)
- Remove 3094 hose clamps.

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48-54



- Install pressure line and tighten banjo bolt -2-.
  - Always replace seals
  - Tightening torque: 50 Nm (37 ft lb)
- Install suction hose -1-.



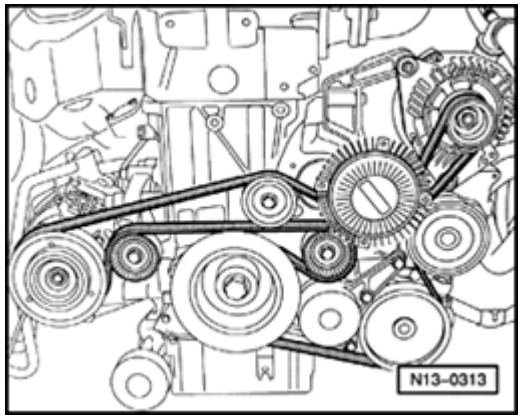
- Tighten socket-head bolts for coolant pump pulley.

  Tightening torque: 25 Nm (18 ft lb)
- Install fan at viscous coupling.

  Tightening torque: 10 Nm (7 ft lb)

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48-55



- Install ribbed belt.

CAUTION!

- ***Mark the running direction before removing. Reinstalling a used belt in reversed running direction could damage the belt.***
- ***Make sure that the belt is correctly seated in the pulleys.***

Note:

Illustration is shown without the lock carrier installed for greater clarity.

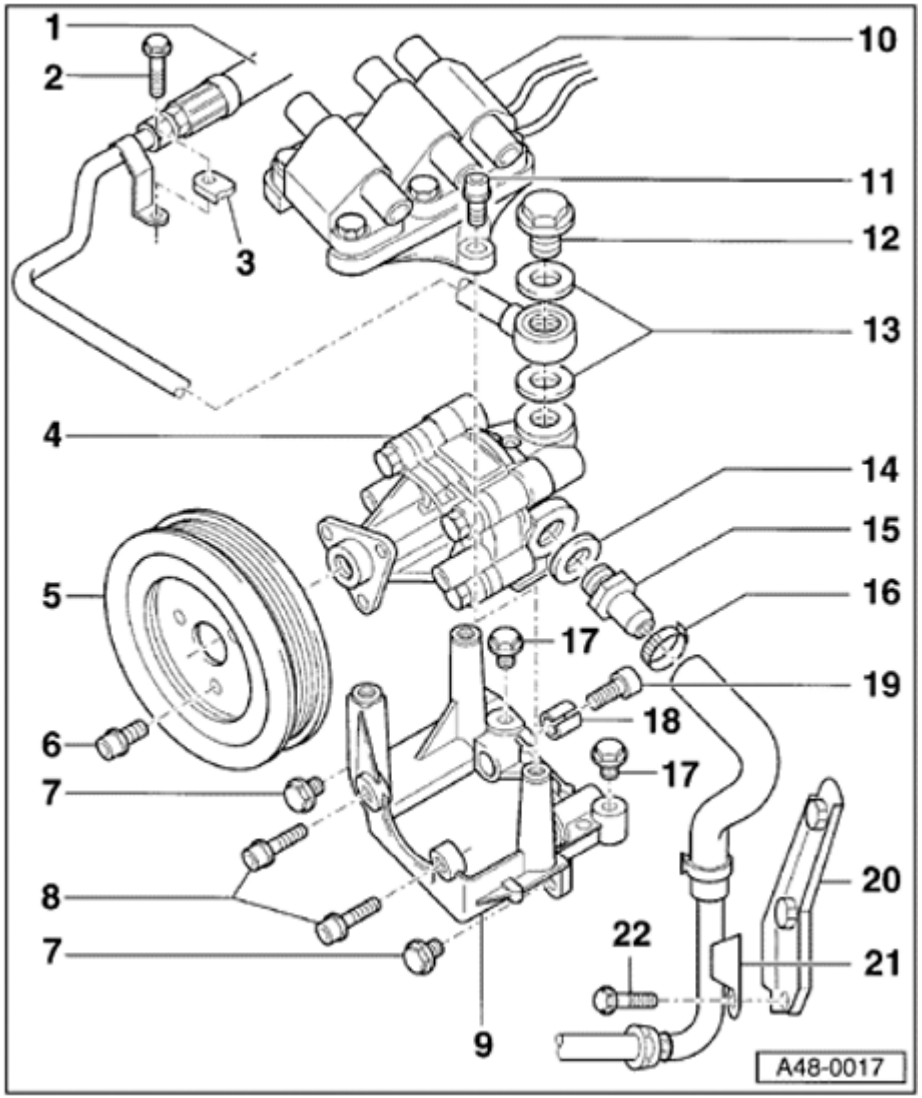
- Top off hydraulic fluid ⇒ page 48-22 .
- Install bumper:

⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Start engine and make sure ribbed belt runs properly.
- Check hydraulic fluid level ⇒ page 48-22 .
- Bleed steering system ⇒ page 48-24 .
- Check steering system for leaks ⇒ page 48-25 .

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48-56



Power steering pump (6-cyl. engine), removing and installing

Notes:

- *Always replace seals.*
- *Do not reuse hydraulic fluid.*
- *The power steering system uses hydraulic fluid, Part No. G 002 000.*
- *System hydraulic fluid capacity: approx. 1 liter (1 qt).*

1 - Pressure line with hose

2 - Bolt

- 8 Nm (71 in. lb)

3 - Plate with mounting hole

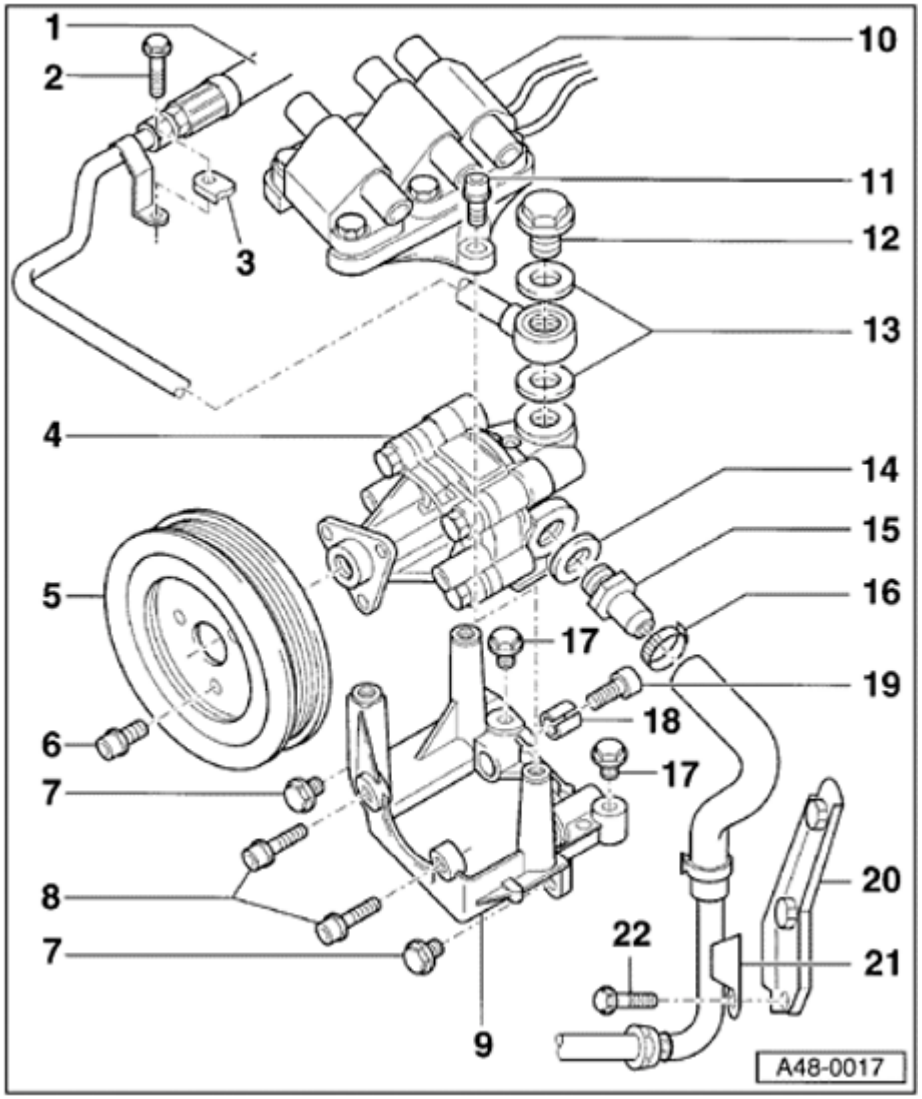
- At intake manifold
- For mounting line - 1 -

4 - Power steering pump

- Fill with hydraulic fluid before installing ⇒ Notes, page 48-27

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48-57



5 - Belt pulley

6 - Socket-head bolts

- 25 Nm (18 ft lb)
- Counterhold using VAG1590 (if applicable) while loosening and tightening

7 - Bolts

- 25 Nm (18 ft lb)

8 - Socket-head bolts

- 25 Nm (18 ft lb)

9 - Power steering pump bracket

10 - Ignition coils with bracket

11 - Socket-head bolt

- 25 Nm (18 ft lb)

12 - Banjo bolt

- 40 Nm (30 ft lb)

13 - Seals 16 x 22

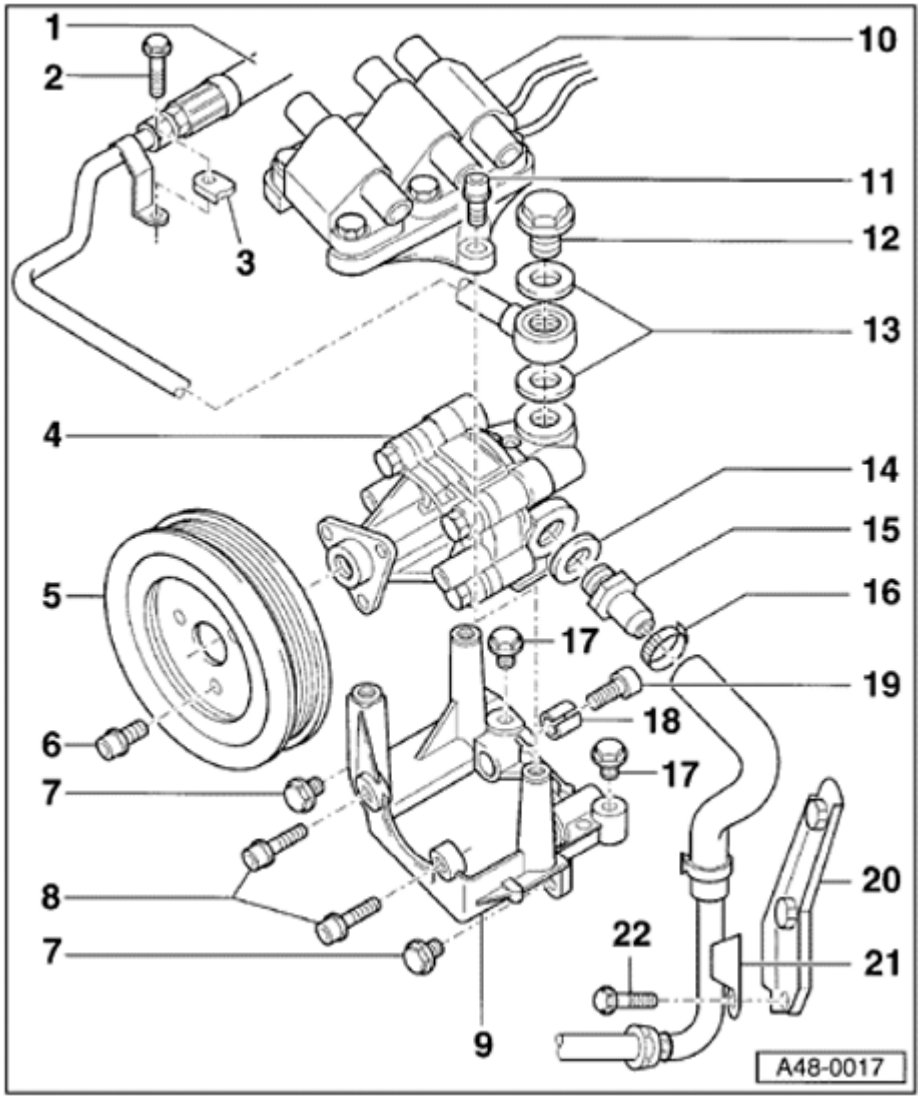
- Always replace

14 - Seal 18 x 24

- Always replace
- 6 cyl. 2V gasoline engine only

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48-58



15 - Line union

- 50 Nm (37 ft lb)
- Vehicles with V6 2V gasoline engine
- Vehicles with power steering pump: FP-3

16 - Clamp

- Always replace
- Use VAG1275 to tighten

17 - Bolts

- 25 Nm (18 ft lb)

18 - Slotted bushing

19 - Socket-head bolt

- 25 Nm (18 ft lb)

20 - Bracket

21 - Suction line with hose

22 - Bolt

- 8 Nm (71 in. lb)

Removing

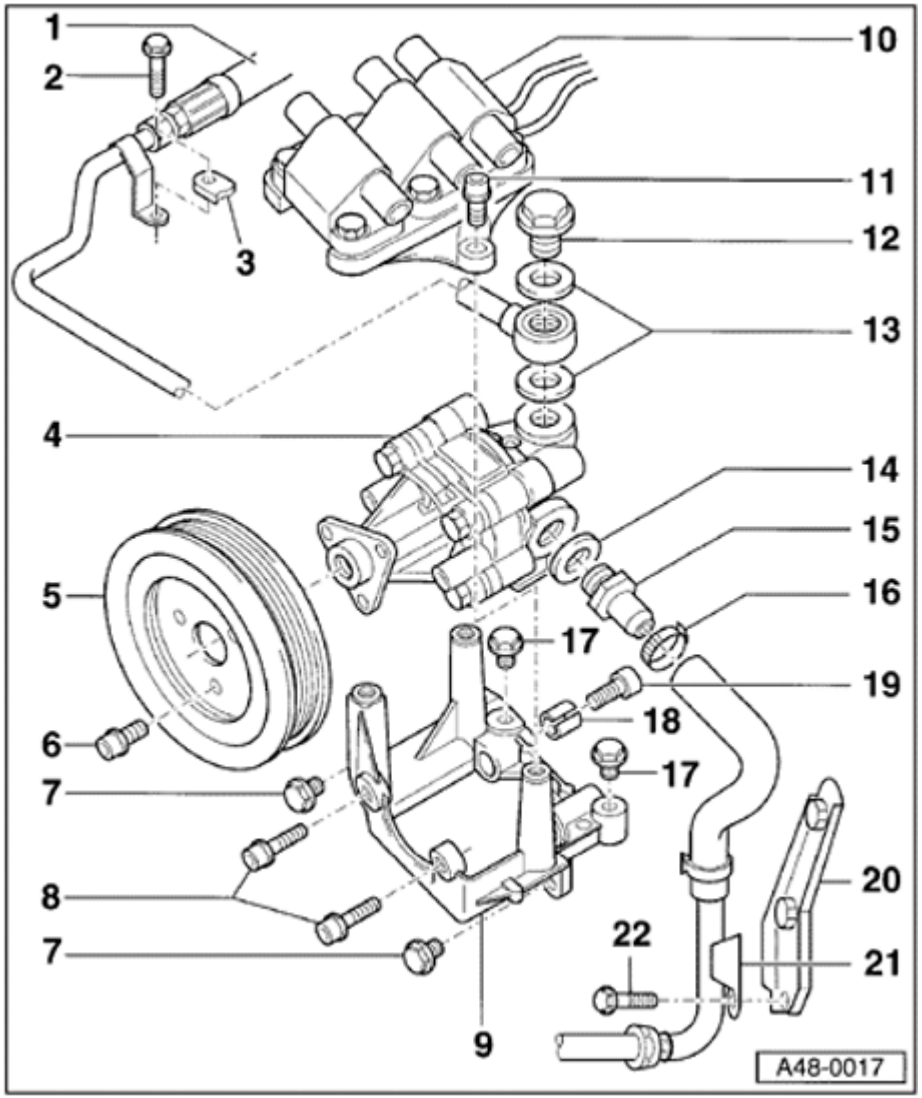
- Unclip and remove engine cover ⇒ Fig. 1 .
- Unbolt and remove cover for ribbed belt

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⇒ Fig. 2 .

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48-59



- Loosen and remove ribbed belt ⇒ Fig. 3 .
- Counterhold belt pulley - 5 - using VAG1590 (if applicable) and remove.
- Disconnect ignition wires from ignition coils - 10 - .
- Pinch off suction hose using 3094 hose clamp.
- Remove pressure and suction lines.
- Unbolt bracket - 9 - and remove together with pump - 4 -.
- Remove bolts mounting pump to bracket and remove pump.

Installing

- Install in reverse order of removal.

Note:

The ignition wires must be correctly reinstalled in the correct firing order ⇒ Fig. 4 .

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48-60

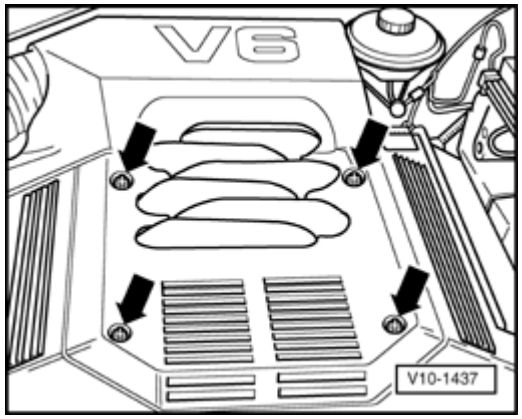


Fig. 1 Unclipping and removing top engine cover

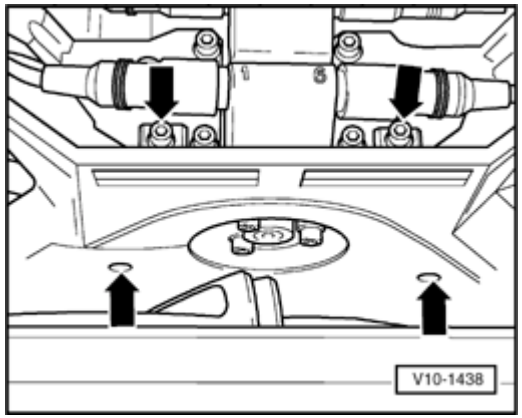


Fig. 2 Unbolting ribbed belt cover

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48-61

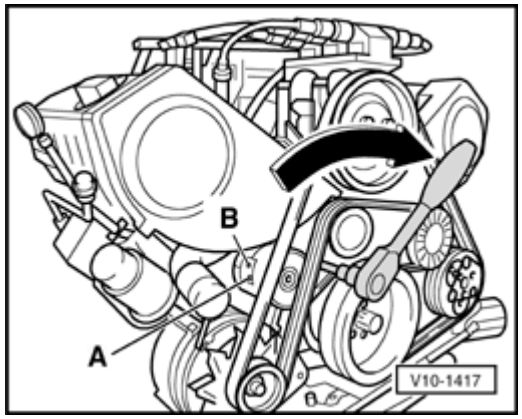


Fig. 3 Loosening and removing ribbed belt

- Using 17 mm hex wrench, turn clockwise (arrow) to loosen ribbed belt.
- Align holes -A- and -B-.
- Insert 3204 drift to lock tensioner in position.
- Remove ribbed belt from belt pulley.

CAUTION!

Mark the running direction before removing. Reinstalling a used belt in reversed running direction could damage the belt.

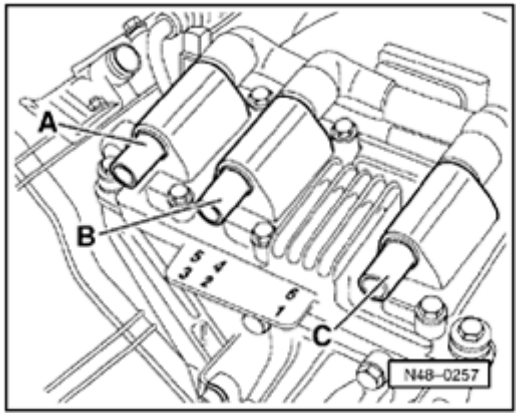


Fig. 4 Assignment of ignition wires to ignition coils

A - Ignition coil for cylinders 5 and 3

B - Ignition coil for cylinders 4 and 2

C - Ignition coil for cylinders 6 and 1

The ignition wires are numbered from 1 to 6:

- Connect ignition wires 5 and 3 to ignition coil -A-.
- Connect ignition wires 4 and 2 to ignition coil -B-.
- Connect ignition wires 6 and 1 to ignition coil -C-.

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Airbag

Airbag system, safety precautions

WARNING!

- ***Airbag components must only be checked, removed, installed and/or repaired by qualified Service department personnel.***
- ***NEVER conduct tests on airbag system components with a test light or multimeter.***
- ***The airbag system must only be checked when installed in the vehicle, using the VAG1551 scan tool.***
- ***Before starting work on any part of the airbag system, disconnect the battery Ground (GND) strap. No waiting time is necessary after disconnecting the battery. When reconnecting the airbag system to a power supply source (i.e. reconnecting the Ground strap), the passenger compartment must NOT be occupied.***

CAUTION!

- ***Airbag units must be installed immediately after being removed from their packaging.***

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- ***If the work is interrupted during the installation, return the airbag unit to its packaging.***

- ***DO NOT leave an airbag unit unattended.***

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48-63

CAUTION!

- ***After removal from the vehicle, ALWAYS set the airbag unit down with padded side facing upward.***
- ***Airbag system components must not be opened, disassembled or repaired. Always use new parts.***
- ***Airbag units which have dropped onto a hard surface or show signs of damage must not be installed in the vehicle.***
- ***Airbag units have a limited service life. Airbag units must be replaced after 14 years. On vehicles ➢ m.y. 1997, also replace sticker on B-pillar. On vehicles m.y. 1997 ➢ there is no longer a sticker on B-pillar, replacement info. must be recorded in the service record.***
- ***Airbag units which have not been activated should be placed in the airbag unit transport container, marked and returned to the Warranty Parts Test Center for proper disposal. DO NOT deploy airbag in the vehicle.***
- ***NEVER treat airbag units with grease,***

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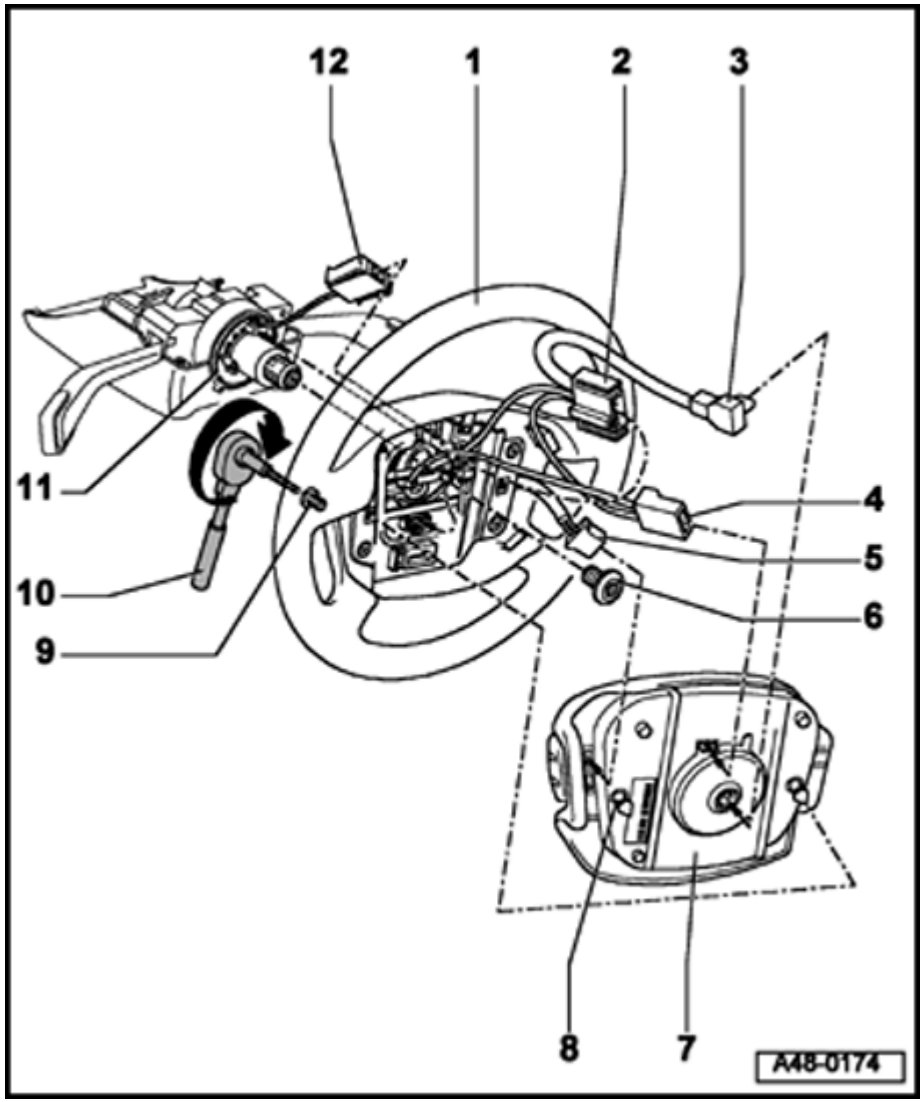
cleaners or similar materials.

- ***NEVER expose airbag units to temperatures above 100° C (212° F), even for short periods.***

Removing and installing airbag unit:

⇒ *Repair Manual, Body Interior, Repair Group 69*

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Driver-side airbag unit, removing and installing

WARNING!

Observe all safety precautions before starting work on any part of the airbag system ⇒ ***page 48-62*** .

1 - Steering wheel

- Removing and installing ⇒ page 48-67
- Secure loose wiring

2 - Harness connector for spiral spring

3 - Harness connector for airbag unit

4 - Harness connector for electrostatic discharge

- ➢ 1998 m.y. only

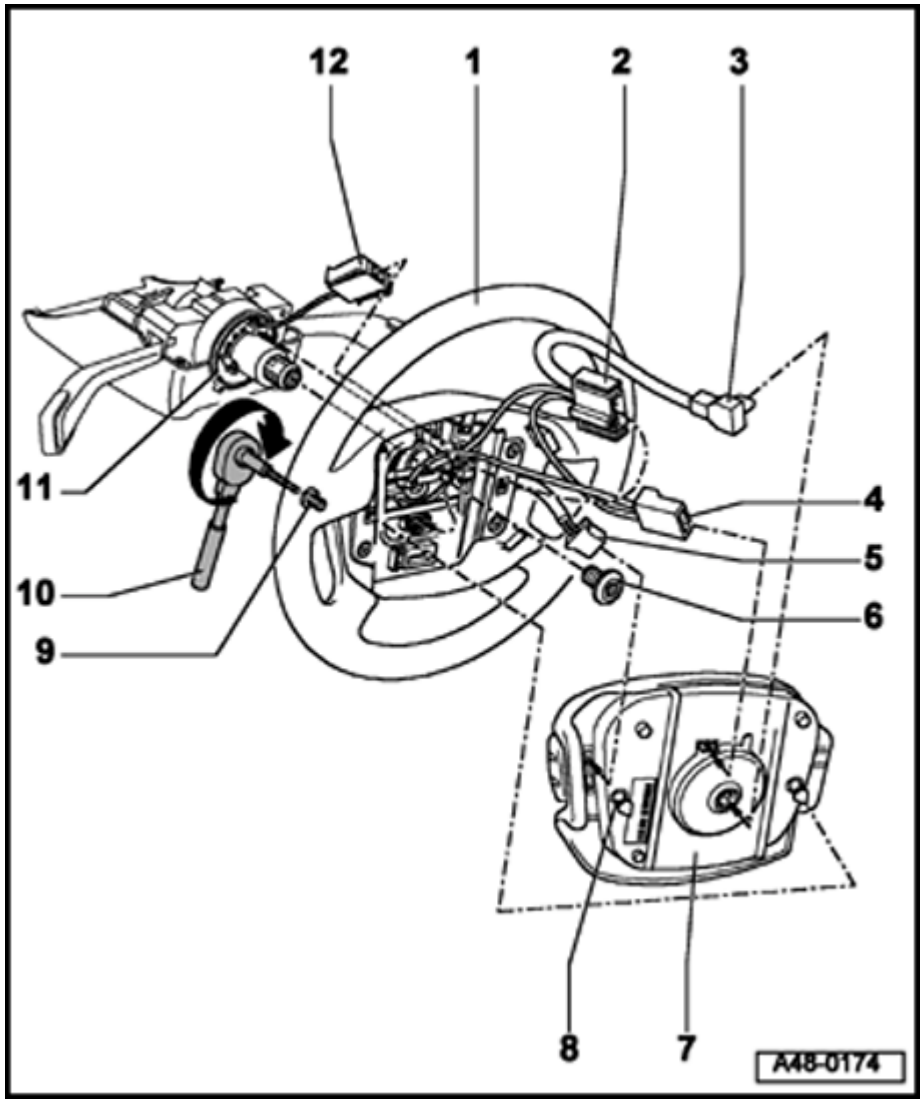
5 - Multi-function harness connector

- Vehicles with multi-function feature only

6 - Multi-point socket head bolt

- Always replace
- 60 Nm (44 ft lb)

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7 - Airbag unit

8 - Locking lugs

9 - Torx® screws

- 7 ± 1 Nm (62 ± 9 in. lb)
- M.y. 1998 ➢ locking lugs - 8 - replaced with Torx® screws

10 - Torx® bit socket (T30)

11 - Self-cancelling ring, spiral spring and slip ring

12 - Harness connector for heated steering wheel

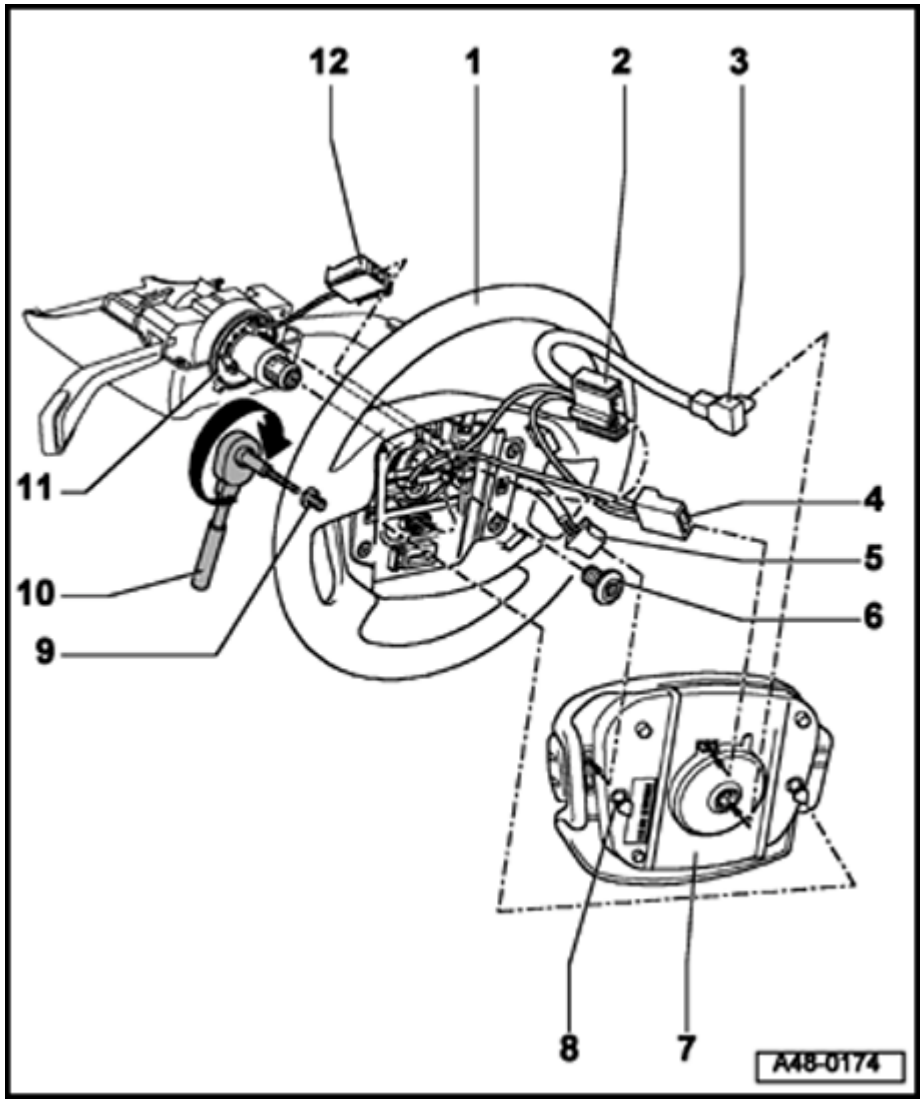
Removing

WARNING!

Observe all safety precautions before starting work on any part of the airbag system ⇒ ***page 48-62*** .

- Release steering column adjustment mechanism.
- Pull steering wheel outward and upward as far as possible.
- Turn steering wheel so that hub and spokes are in vertical position.

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- Unscrew Torx® screws (in direction indicated by arrow) and remove airbag unit.
- Disconnect harness connectors - 3 - and - 4 - from airbag unit.
- Place airbag unit down with padded side facing upward.

Installing

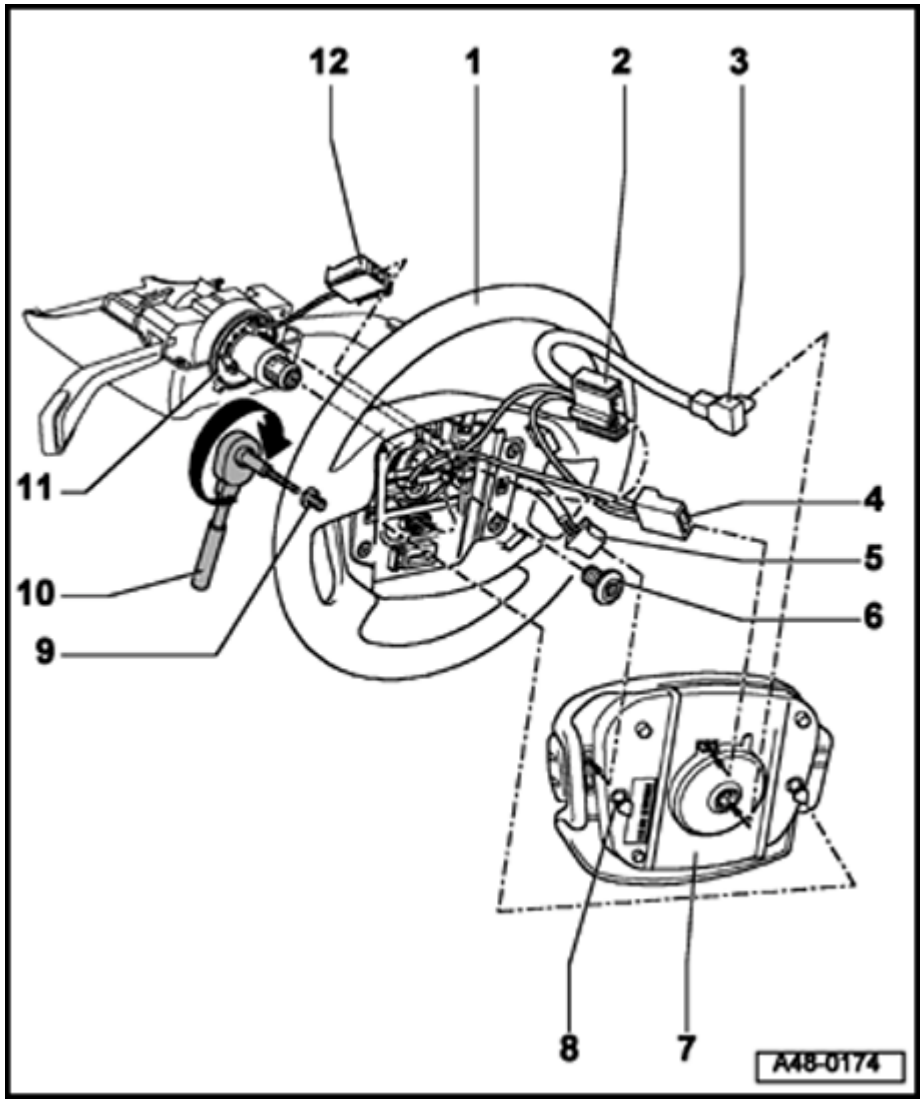
- Make sure harness connectors and airbag unit engage properly (with audible click).

WARNING!

Make sure the passenger compartment is not occupied before connecting the battery Ground (GND) strap.

- Switch ignition on then connect battery Ground (GND) strap.

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Steering wheel, removing and installing

WARNING!

Observe all safety precautions before starting work on any part of the airbag system ⇒ page 48-62 .

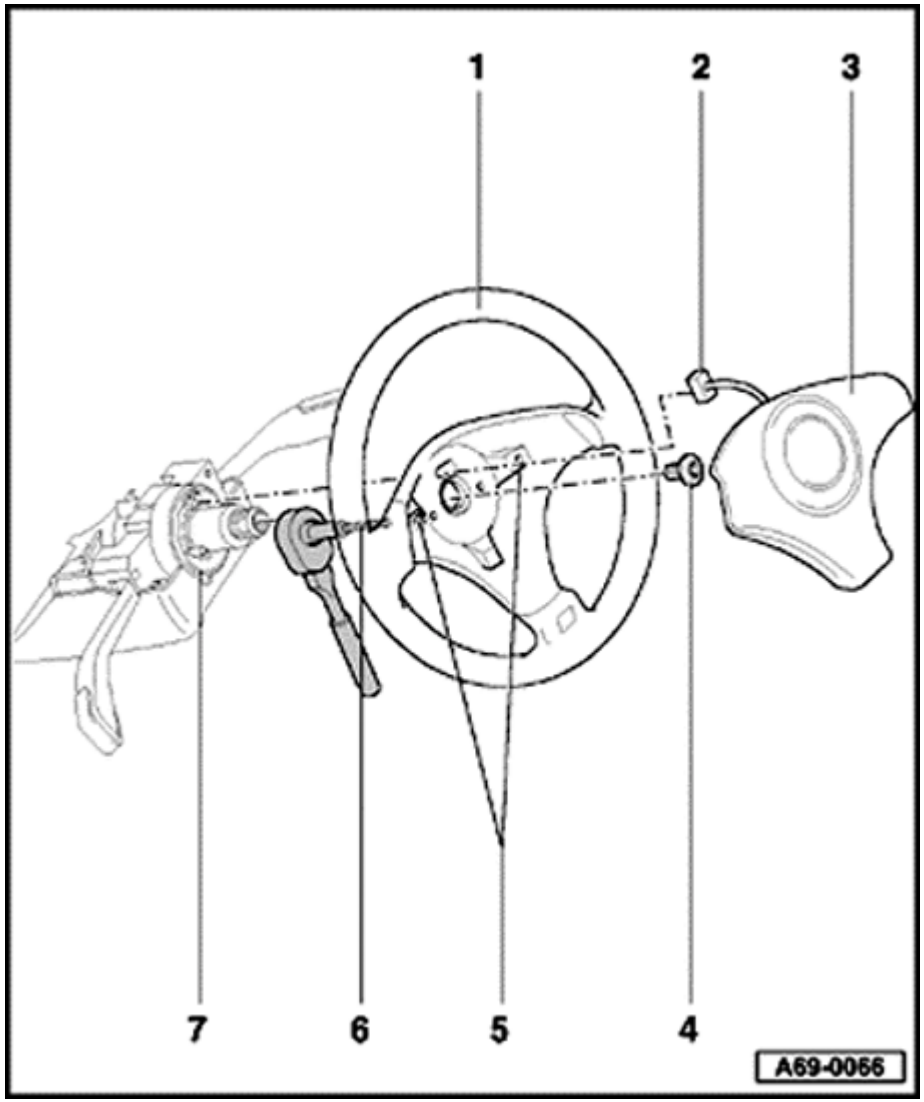
Removing

- Remove airbag unit ⇒ page 48-64 .
- Turn steering wheel to center position (wheels straight-ahead).
- Remove bolt - 6 -.
- Disconnect harness connectors - 2 - and - 12 -.

Installing

- Install steering wheel in center position (wheels straight-ahead).
- Make sure harness connectors engage properly (with audible click).
- Install new bolt - 6 - and tighten to 60 Nm (44 ft lb).
- Install airbag unit ⇒ page ⇒ Page 48-64 .

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Driver-side airbag unit (sport steering wheel), removing and installing

WARNING!

Observe all safety precautions before starting work on any part of the airbag system ⇒ ***page 48-62*** .

1 - Steering wheel

- Removing and installing ⇒ page 48-70

2 - Harness connector for spiral spring

3 - Airbag unit

4 - Multi-point socket-head bolt

- Always replace
- 60 Nm (44 ft lb)

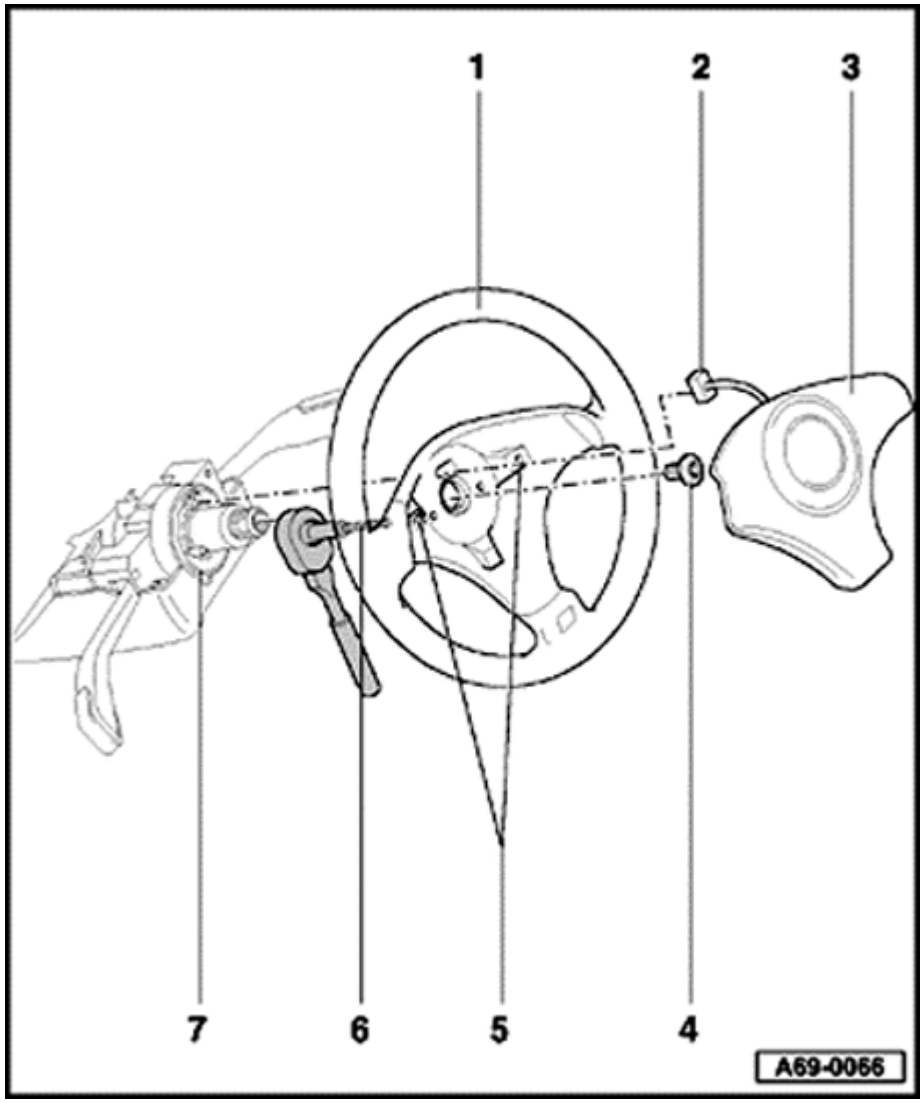
5 - Torx® bolts (T30)

- 7 Nm (62 in. lb)

6 - Torx® bit socket (T30)

7 - Self canceling ring, spiral spring and slip ring

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Removing

- Using Torx® bit socket (T30) remove bolts mounting airbag unit.
- Disconnect harness connector - 2 -.
- Place airbag unit down with padded side facing upward.

Installing

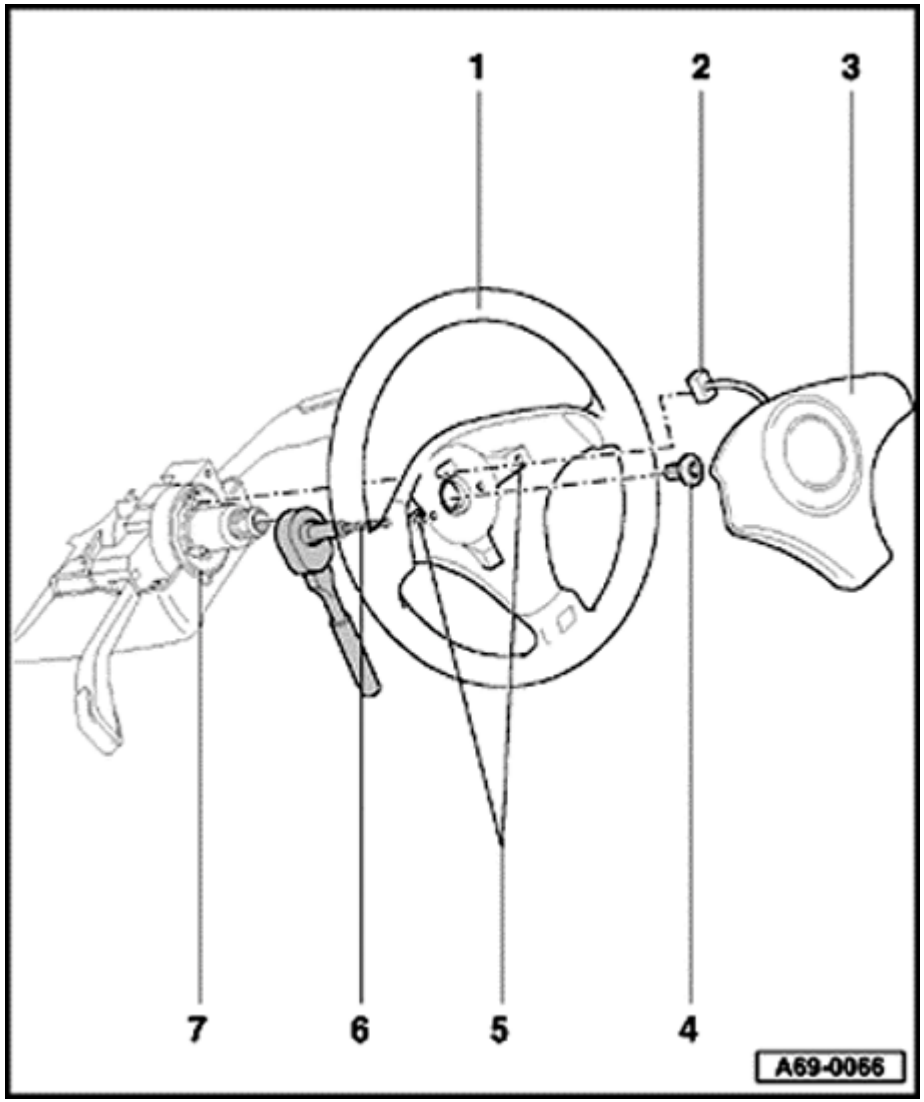
- Make sure harness connector - 2 - engages properly (with audible click).
- Install airbag unit and tighten bolts to 7 Nm (62 in. lb).

WARNING!

Make sure the passenger compartment is not occupied before connecting the battery Ground (GND) strap.

- Switch ignition on and connect battery Ground (GND) strap.

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Sport steering wheel, removing and installing

WARNING!

Observe all safety precautions before starting work on any part of the airbag system ⇒ page 48-62 .

Removing

- Remove airbag unit ⇒ page ⇒ Page 48-68 .
- Turn steering wheel to center position (wheels straight-ahead).
- Remove bolt - 4 -.

Installing

- Install steering wheel in center position (wheels straight-ahead).
- Replace bolt - 4 - and tighten to 60 Nm (44 ft lb).
- Install airbag unit ⇒ page ⇒ Page 48-68 .

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48-71

Steering column, removing and installing

The steering column is supplied as an assembly through the Parts Department. The steering column is serviced by replacement only.

The ignition lock from the faulty steering column can be refitted ⇒ page 48-82 .

WARNING!

Before removing the steering wheel:

- ***Observe all safety precautions before starting work on any part of the airbag system ⇒ page 48-62 .***
- ***Disconnect the battery Ground (GND) strap.***
- ***With wheels in the straight-ahead position, unplug the single-pin connector for the airbag system power supply.***

Non compliance with the above can cause failure of the airbag system.

Notes:

- *Removing and installing driver's-side airbag unit*

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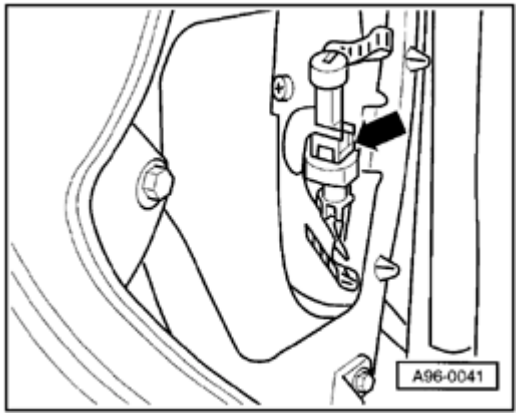
⇒ *page 48-64* *(for sport steering wheel ⇒ page 48-68).*

- *Check Diagnostic Trouble Code (DTC) memory for the airbag system before unplugging the single-pin connector:*

⇒ *Repair Manual, Body On Board Diagnostic (OBD), Repair Group 01*

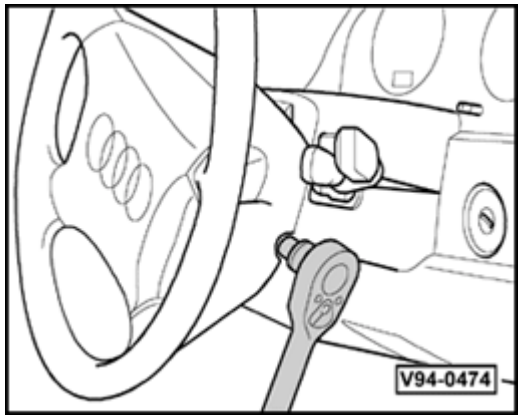
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48-72



➢ The red single-pin connector for the airbag system power supply is located on the right behind the instrument panel cover.

- Open front passenger door, remove cover and disconnect single-pin connector.



➢ - Unbolt airbag unit from behind at left and right sides of steering wheel using T30 Torx® bit.

  Tightening torque: 7 Nm (62 in. lb)

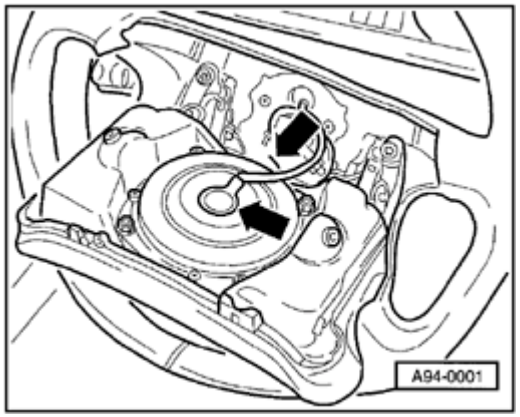
WARNING!

Always observe the safety precautions for airbag systems when performing any work on the components of the airbag system ⇒ Repair Manual, "Body Interior," Repair Group 69 and ⇒ Repair Manual, "Body On Board Diagnostic (OBD), Repair Group 01.

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48-73

- Carefully fold back airbag unit.

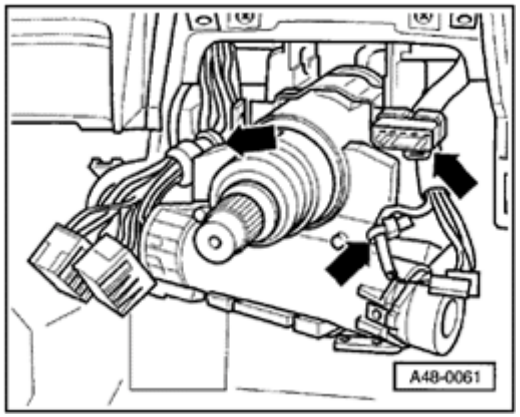


- Disconnect harness connector from airbag unit and place airbag unit aside.
- Unbolt steering wheel; when doing this, make sure that spiral spring is not twisted.
- Remove storage shelf on driver's side:

⇒ *Repair Manual, Body Interior, Repair Group 70*

- Remove steering column switch together with trim:

⇒ *Repair Manual, Electrical Equipment, Repair Group 94*



- Remove all tie wraps (arrows) and disconnect harness connectors.

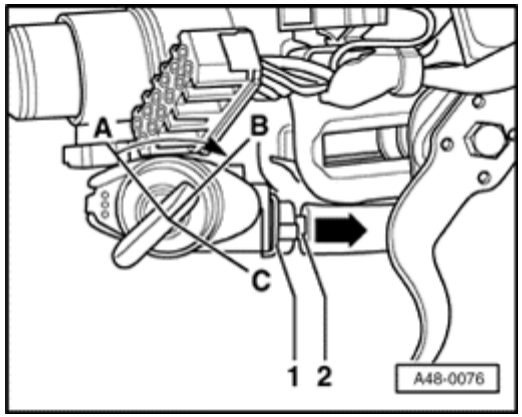
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48-74

Disengaging lock cable

On vehicles equipped with an automatic transmission, the lock cable must be disengaged:

- Place transmission selector lever in Park position.

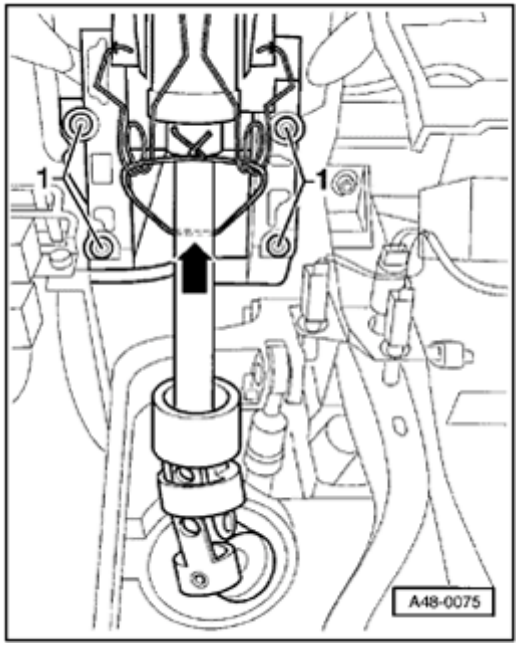


- Turn ignition key to position -B- (ignition ON).
- Lift locking clip -1- slightly and remove Bowden cable -2- from steering lock housing.

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48-75

Securing steering column prior to removal

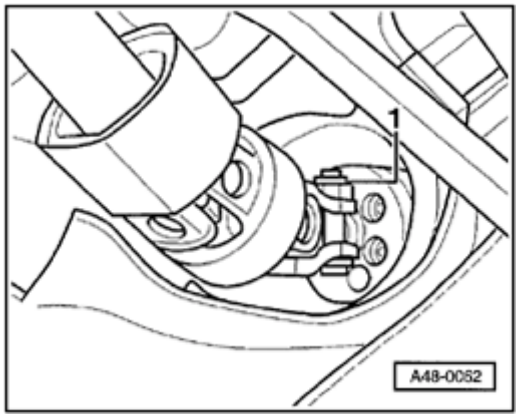


- Route safety wire through hole in bottom part of steering column (arrow) and spring to secure top and bottom parts of steering column before removing steering column from steering gear pinion.

The steering column can also be secured with a transportation safeguard ⇒ page 48-76 .

CAUTION!

- ***The splines between the top and bottom parts of the steering column must not be separated. If the two halves are separated and reassembled with the splines no longer in their original installed positions a rattling noise may result.***
- ***Turn the steering wheel to the center position and do not alter position during repairs, otherwise the airbag unit spiral spring may be damaged.***

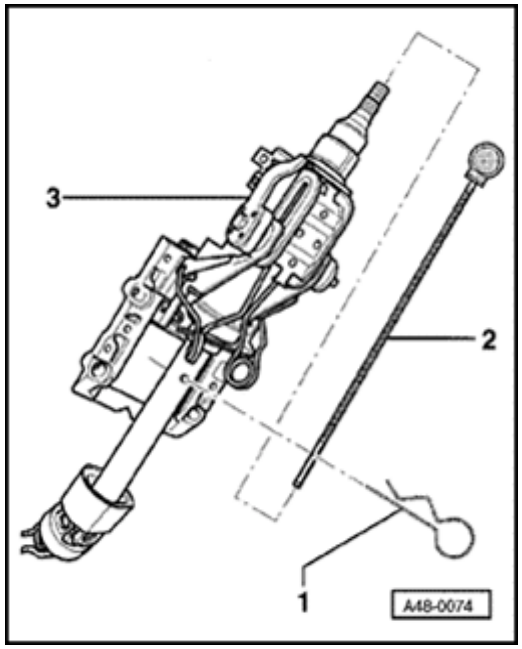


- Unscrew nut -1- at universal joint.
- To release eccentric, turn bolt (Torx® T50) clockwise and remove.
- Remove universal joint from steering gear pinion.
- Remove socket head bolts -1- (⇒ illustration A48-0075 above) and remove steering column.

Removing and installing steering lock housing ⇒ page 48-82 .

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48-76



Installing

1 - Locking clip

2 - Plastic rod

3 - Steering column

New replacement steering columns are supplied with a transportation safeguard installed. This safeguard must be removed after installing the steering column in the vehicle.

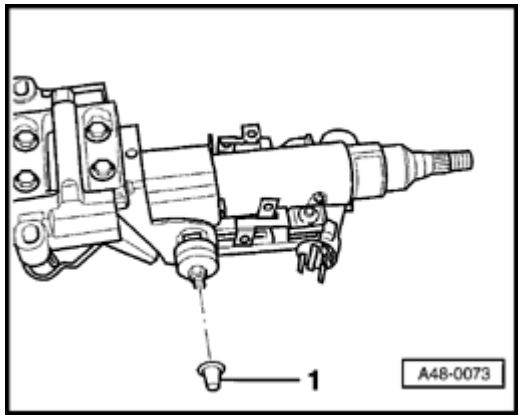
Note:

It is recommended to save the transportation safeguard components for subsequent steering column removals.

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48-77

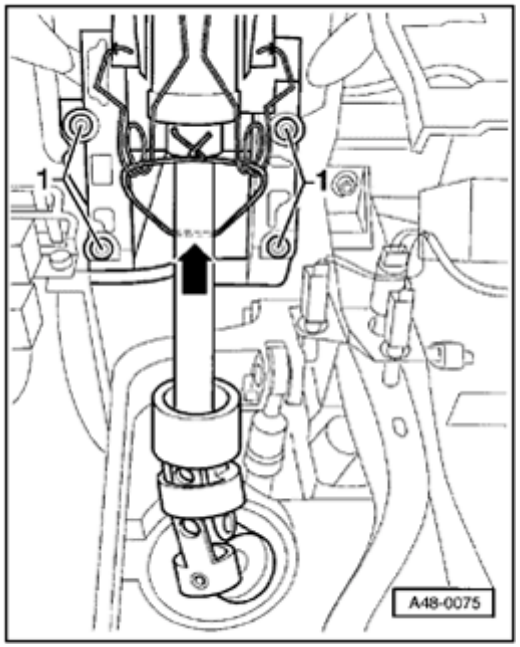
Installing



- When installing steering column, always make sure that cap -1- is installed.

CAUTION!

Cap -1- must always be reinstalled or retrofitted, otherwise the electrical wiring may become chafed.

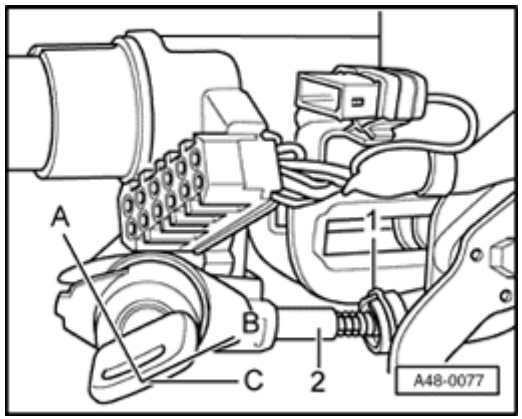


- Mount steering column onto crossmember with four socket-head bolts -1-.
- Attach universal joint to steering gear pinion.
- Insert clamping bolt (Torx® T50) through bottom part and engage by turning counterclockwise. Install nut + washer and tighten to 40 Nm (30 ft lb).

CAUTION!

The splines between the top and bottom parts of the steering column must not be separated. If the two halves are separated and reassembled with the splines no longer in their original installed positions a rattling noise may result.

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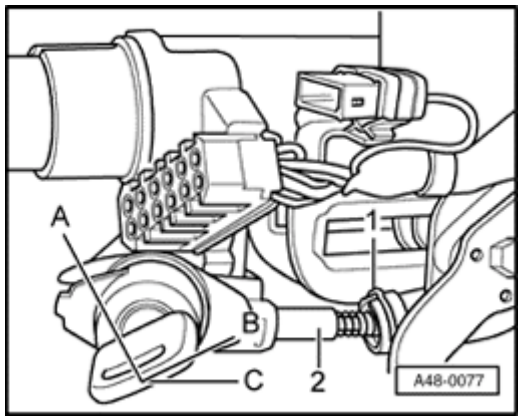
Engaging lock cable on vehicles with automatic transmission

- Ignition key must be in position -B- (ignition ON) to engage lock cable

- Move selector lever to park position.
- Insert lock cable -2- into steering lock housing.
  - Make sure locking clip -1- engages.

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48-79



Checking function of lock cable

Applies only to vehicles with automatic transmission.

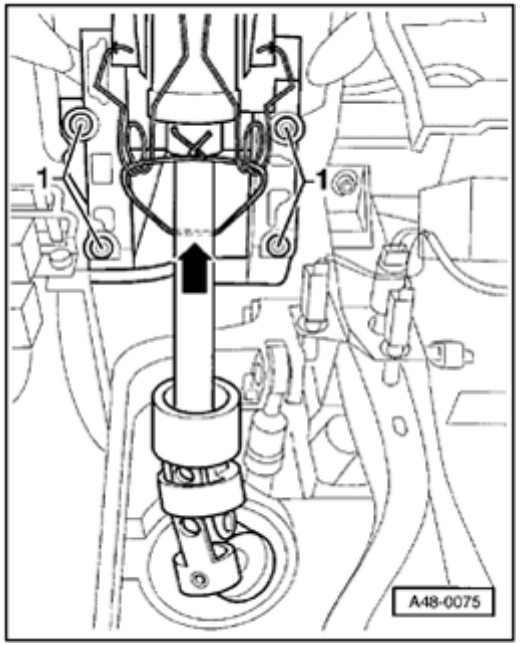
- Turn ignition key to position -B- (ignition ON).
  - ♦ It must be possible to move selector shift lever smoothly out of Park position
  - ♦ It must only be possible to remove ignition key with selector lever in Park position
- Move selector lever to park position.
  - ♦ Ignition lock must function smoothly
  - ♦ It must not be possible to move selector lever with ignition key in position -A- (ignition OFF). Ignition key can be removed

Lock cable, removing, installing and adjusting:

⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*

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48-80



Installing, continued for all vehicles

- Remove safety wire between top and bottom parts of steering column.
- Install steering column switch with trim:

⇒ *Repair Manual, Electrical Equipment, Repair Group 94*

- Align steering column relative to trim and make sure joints (gaps) are even.
- Tighten socket-head bolts -1-.

  Tightening torque: 22.5 Nm (17 ft lb)
- Install storage shelf on driver's side:

⇒ *Repair Manual, Body Interior, Repair Group 70*

- Install steering wheel and airbag unit:

⇒ *Repair Manual, Body Interior, Repair Group 69*

WARNING!

- ***Make sure that no person is in the vehicle when re-connecting the battery Ground strap.***
- ***Observe all safety precautions (⇒ Repair Manual, Body Interior, Repair Group 69) whenever working on an airbag equipped vehicle.***

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48-81

Steering column, checking for damage

Determining if steering column must be replaced following an accident:

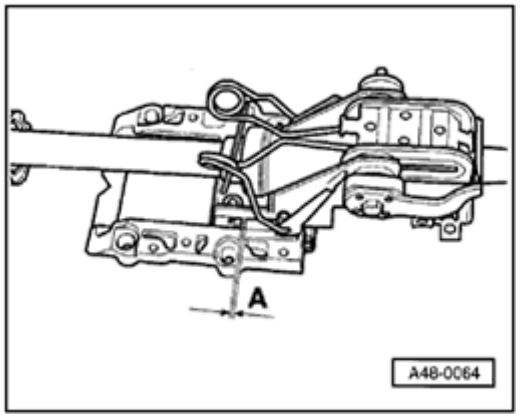
Visual check

- Check all steering column components for damage.

Functional check

- Make sure steering column turns easily without jerking.

- Make sure steering column can be adjusted for height and reach.



- Check gap (dimension -A-) between slide and mounting bracket.

  - If dimension -A- is larger than 0.5 mm (0.20 in.), steering column is damaged and must be replaced

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48-82

Steering lock housing, removing and installing

WARNING!

- ***Before removing the steering column, make sure the wheels are in the straight-ahead position.***

- ***Observe the safety precautions for working on airbags ⇒ page 48-62 .***

Non compliance with the above can cause failure of the airbag system.

- Remove steering column ⇒ page 48-71 .

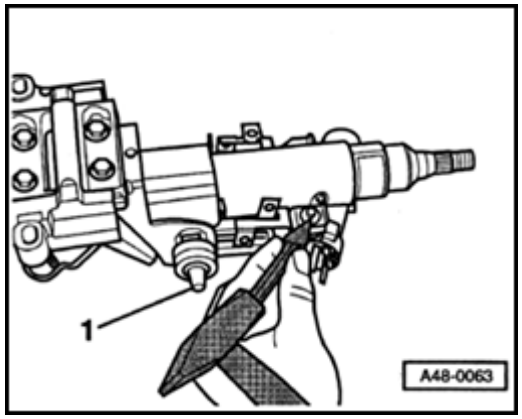
Notes:

- *The steering column must be removed and clamped in a vise to chisel off the shear bolts. If the shear bolts are chiseled off with the steering column installed the steering column mounting bracket will be damaged.*

- *Do not clamp the steering column in a vise at the mounting bracket otherwise the plastic coating will be damaged.*

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48-83



Chiselling open shear bolts

Shear torque of new bolts is ≥ 20 Nm (15 ft lb).

- Make sure that cap -1- is installed to avoid risk of chafing electrical wiring when installing.
- Remove lock cylinder:

⇒ *Repair Manual, Electrical Equipment, Repair Group 94*

- On vehicles with automatic transmission, disengage lock cable ⇒ page 48-74 .

Installing

- Install new shear bolts.
- Tighten shear bolts until head shears off.
- On vehicles with automatic transmission, engage lock cable ⇒ page 48-78 .
- Check function of lock cable ⇒ page 48-79 .
- Install lock cylinder and ignition switch:

⇒ *Repair Manual, Electrical Equipment, Repair Group 94*

- Make sure turn signal lever is in neutral position (to avoid damaging reset cam of switch) and install steering wheel.
- Install airbag unit ⇒ page 48-64 .

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Manually adjustable steering column, removing and installing

Removing

The manually adjustable steering column is supplied as an assembly through the Parts Department. The steering column is serviced by replacement only.

The ignition lock from the faulty steering column can be refitted ⇒ page 48-82 .

WARNING!

Before removing the steering wheel:

- ***The wheels must be in straight-ahead position before removing the steering wheel.***

- ***Observe all safety precautions before starting work on any part of the airbag system ⇒ page 48-62 .***

Non compliance with the above can cause failure of the airbag system.

- Remove driver-side airbag unit ⇒ page 48-64 (for sport steering wheel ⇒ page 48-68).

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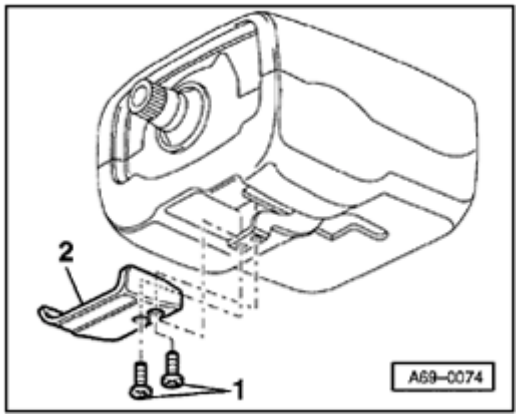
- Remove steering wheel ⇒ page 48-67 (for sports steering wheel ⇒ page 48-70).

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48-85

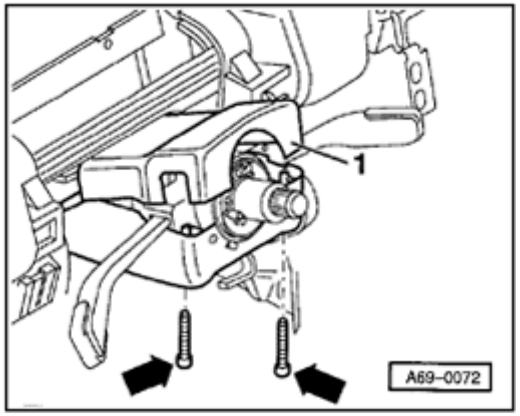
Removing steering column switch

- Release steering column adjuster.
- Pull steering column out fully (to end of adjustment range).



- Remove screws -1- (2x).

  Tightening torque: 3 Nm (27 in. lb)
- Remove handle -2-.



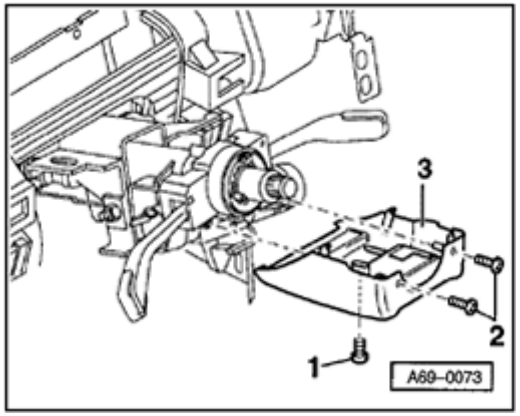
- Remove two screws (arrows).

  Tightening torque: 0.6 Nm (5 in. lb)
- Remove upper section of steering column switch trim -1-.

  When installing, insert upper section into hooks of lower section, swivel downward and install screws

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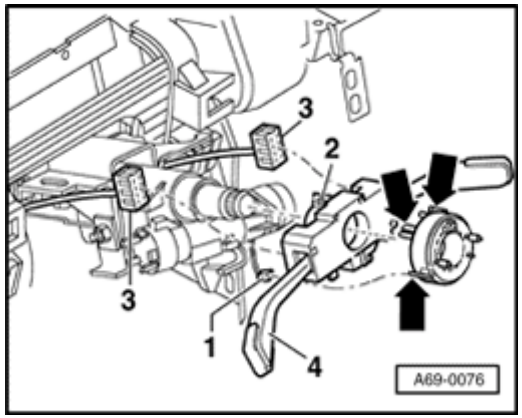
48-86



- Remove screws -2- (2x).

  Tightening torque: 0.6 Nm (5 in. lb)
- Remove socket-head bolt -1-.

  Tightening torque: 0.6 Nm (5 in. lb)
- Remove lower steering column switch trim -3-.

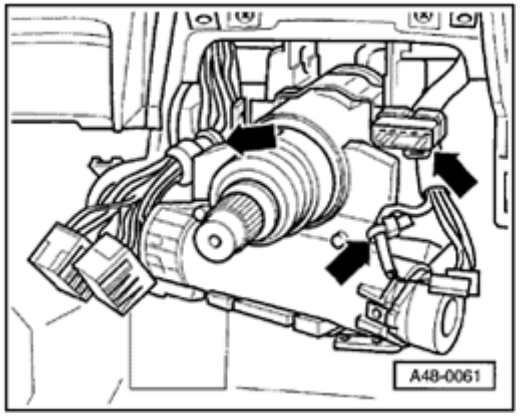


- Disconnect harness connector -1-.
- Remove screw -2-.

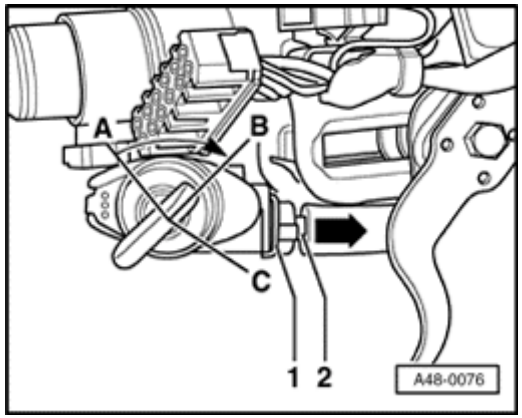
  Tightening torque: 3 Nm (27 in. lb)
- Disconnect harness connectors -3-.
- Remove steering column switch -4-.

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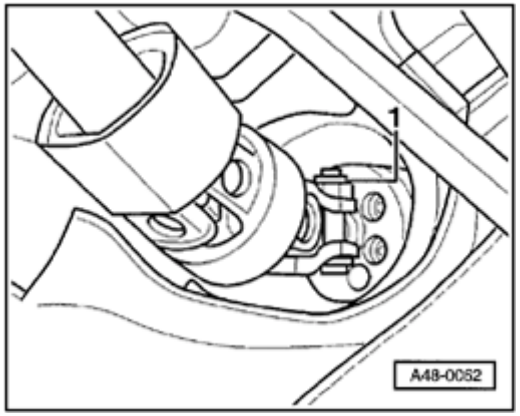
- Remove tie wraps and disconnect harness connectors on steering column.
  - Lock cable must be disengaged on vehicles with automatic transmission
- Move selector lever to "P" position.



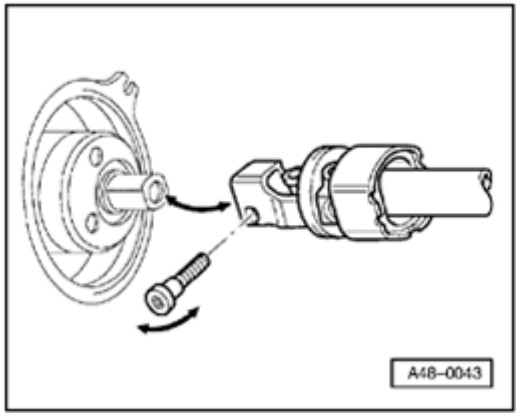
- Turn ignition key to position -B- (ignition ON).
- Lift locking clip -1- slightly and disconnect lock cable -2- from steering lock housing.

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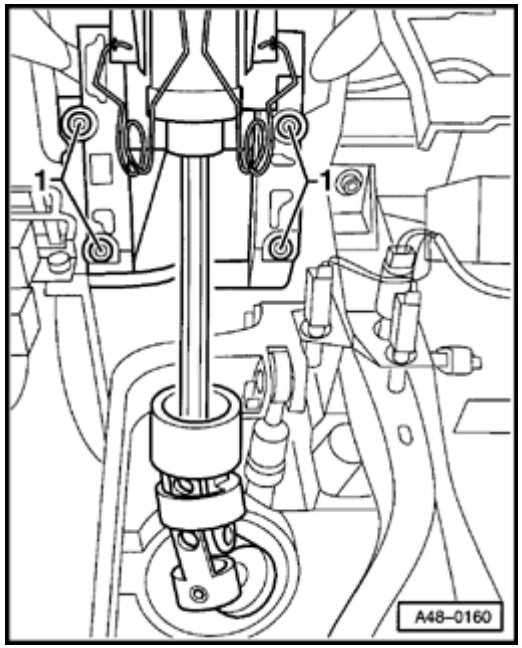
- Remove nut -1- on universal joint.
- Disengage by turning eccentric bolt (Torx® T50) clockwise and remove bolt.
- Release steering column adjuster.



- Swing universal joint clear.

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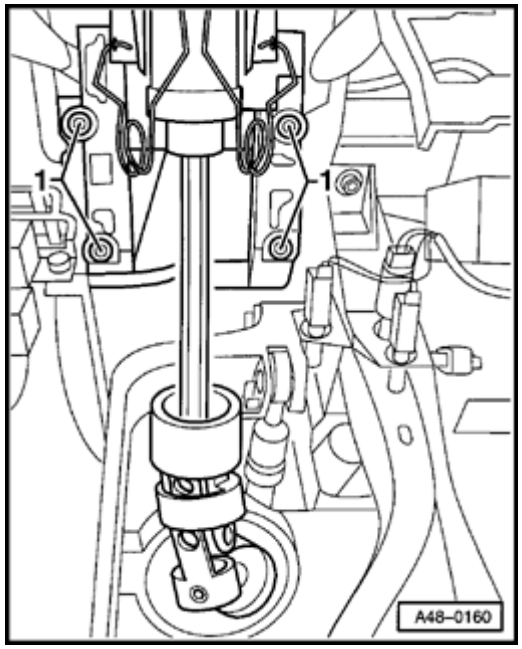
- Remove steering column socket-head bolts -1- and remove steering column.

- Removing and installing steering lock housing ⇒ page 48-95
- Checking steering column for damage ⇒ page 48-94
- Removing and installing lock cylinder:

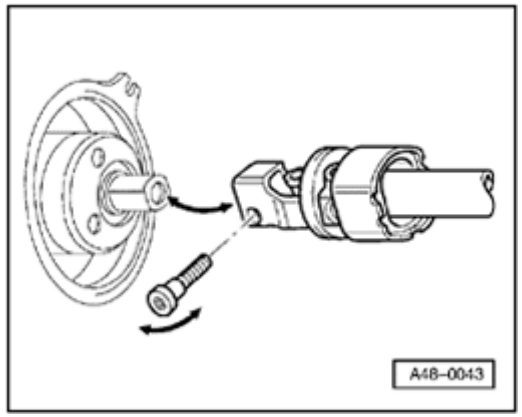
⇒ *Repair Manual, Electrical Equipment, Repair Group 94*

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Installing



- Attach steering column to cross member by installing four socket-head bolts -1-.
- Release steering column adjuster.
- Install universal joint onto steering gear pinion.



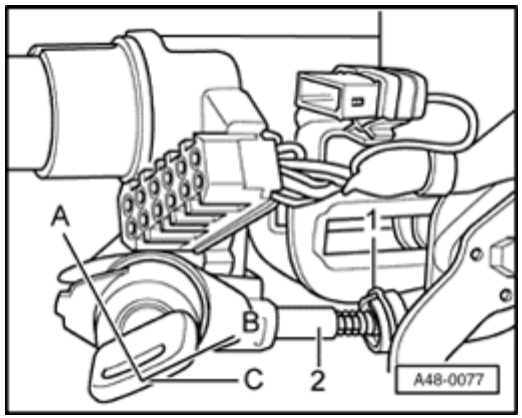
- Install eccentric bolt (Torx® T50) through lower part and tighten (engage) counterclockwise.
- Install nut and tighten.

  Tightening torque: 30 Nm (22 ft lb)

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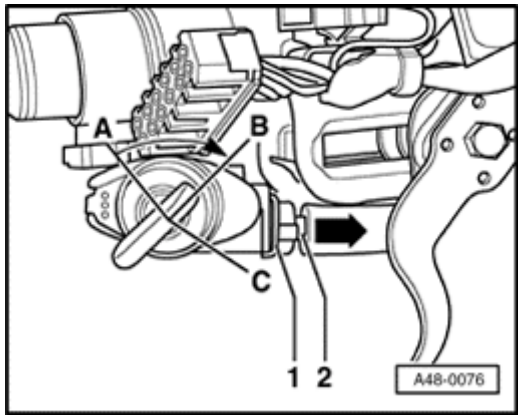
- On vehicles with automatic transmission, lock cable must be engaged



- To engage lock cable, first turn ignition key to position -B- (ignition ON).
- Move selector lever to park position.
- Install lock cable -2- in steering lock housing. Make sure locking clip -1- engages.

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Functional check for lock cable

- Turn ignition key to position -B- (ignition ON).
  - ♦ It must be possible to move selector lever from park position without any resistance
  - ♦ It must only be possible to remove ignition key when selector lever is in park position and ignition key is in OFF position -A-
- Move selector lever to park position.
  - ♦ Ignition lock must operate freely
  - ♦ With ignition key in position -A- (ignition OFF) it should not be possible to move selector lever from park position. Ignition key can be removed

Basic adjustment and routing of lock cable:

⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*

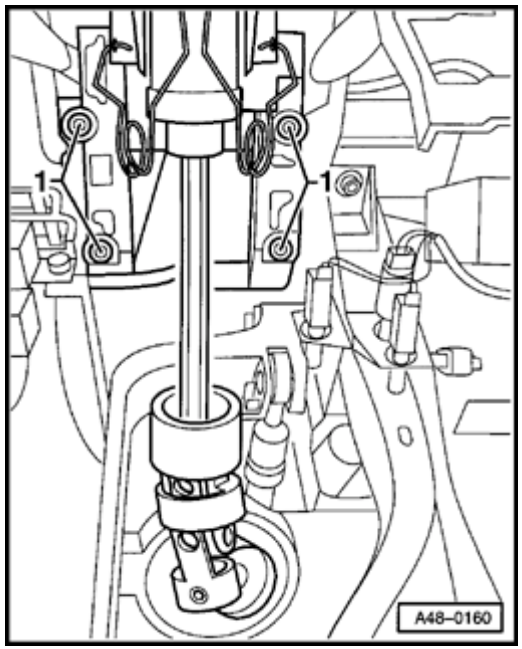
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Installing, continued for all vehicles

- Install steering column switches with trim.

- Align steering column so that gaps in trim are even.



- Tighten socket-head bolts -1- on steering column.

  Tightening torque: 22.5 Nm (17 ft lb)

- Install driver's side storage compartment.
- Install steering wheel ⇒ page 48-67 (for sports steering wheel ⇒ page 48-70).
- Install driver-side airbag unit ⇒ page 48-64 (for sport steering wheel ⇒ page 48-68).

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Steering column, checking for damage

Determining if steering column must be replaced following an accident:

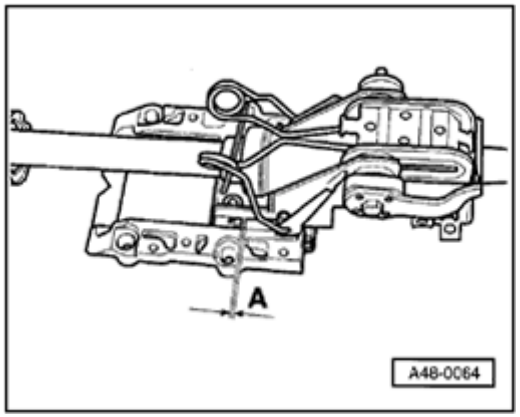
Visual check

- Check all steering column components for damage.

Functional check

- Make sure steering column turns easily without jerking.

- Make sure steering column can be adjusted for height and reach.



- Check gap (dimension -A-) between slide and mounting bracket.

  - If dimension -A- is larger than 0.5 mm (0.20 in.), steering column is damaged and must be replaced

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Steering lock housing, removing and installing

Removing

WARNING!

- ***Before removing the steering column, make sure the wheels are in the straight-ahead position.***

- ***Observe the safety precautions for working on airbags ⇒ page 48-62 .***

Non compliance with the above can cause failure of the airbag system.

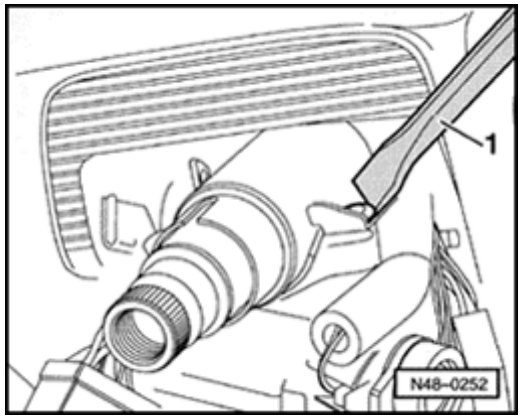
- Remove driver-side airbag unit ⇒ page 48-64 (for sport steering wheel ⇒ page 48-68).

- Remove steering wheel ⇒ page 48-67 (for sports steering wheel ⇒ page 48-70).

- Remove steering column switch ⇒ page 48-85 .

- On vehicles with automatic transmission, disengage lock cable ⇒ page 48-85 .

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- Drill out or chisel off shear bolts using suitable chisel -1-.

Removing and installing lock cylinder:

⇒ *Repair Manual, Electrical Equipment, Repair Group 94*

Installing

- Install new shear bolts.
- Tighten shear bolts until heads shear off.
- On vehicles with automatic transmission, engage lock cable ⇒ page 48-90 .
- Check function of lock cable ⇒ page 48-92 .
- Install steering column switch.
- Install steering wheel ⇒ page 48-67 (for sports steering wheel ⇒ page 48-70).
- Install driver-side airbag unit ⇒ page 48-64 (for sport steering wheel ⇒ page 48-68).

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