

Special tools, test and measuring equipment and auxiliary items required

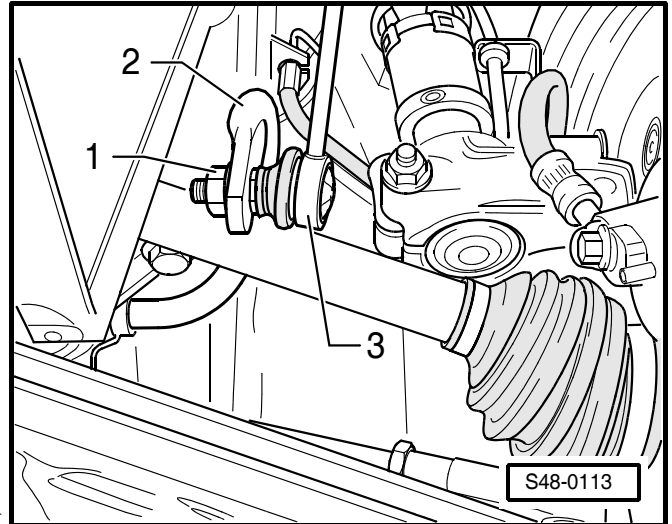
- ◆ Gearbox jack with adapter e.g. -V.A.G 1383 A- with -V.A.G 1359/2-
- ◆ Assembly device -MP 6-414-
- ◆ Extractor -MP 6-425-
- ◆ Side door removal tool -MP 8-605/1- or e.g. supplementary tool kit -V.A.G 1459 B/2-
- ◆ Assembly device -T10064-
- ◆ Extractor -Matra V176-
- ◆ Molykote grease -G 052 723 A2-
- ◆ Polycarbamide grease -G 052 142 A2-
- ◆ Glue sealing mass -Loctite 601-

Removing the wheel hub with wheel bearing

- Raise the vehicle until the front axle is free of stress.
- Unscrew twelve-point nut (or the plate nut) from the drive shaft using a 19 mm Allen key.
- Remove wheel.

Vehicles fitted with anti-roll bar

- Unscrew nut -1-.
- Pull out coupling rod -3- from the anti-roll bar -2-.

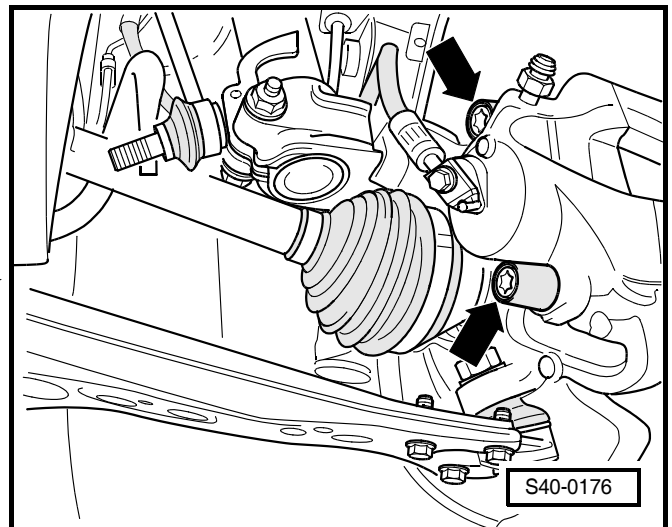


Vehicles with ABS

- Removing the speed sensor.

Vehicles fitted with FS-III floating caliper brake

- Removing the caps from the brake caliper guide bolts.
- Unscrew and remove the two guide bolts -arrows- from the brake caliper.



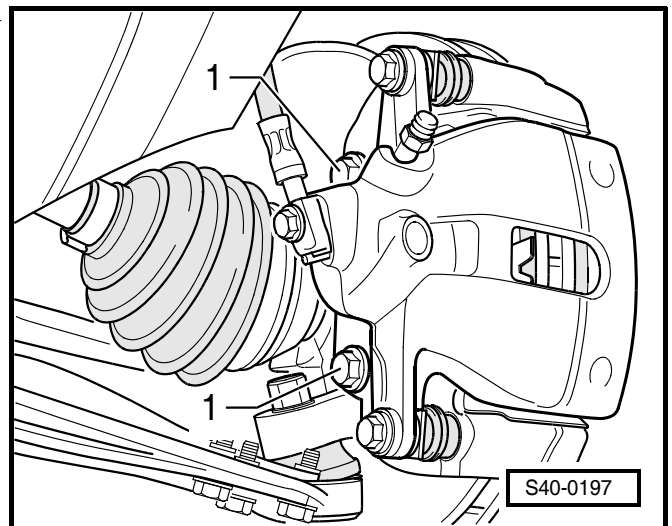
Vehicles fitted with FS-II floating caliper brake

- Unscrew cylinder bolts with hexagon socket head from brake caliper and take out (not shown).

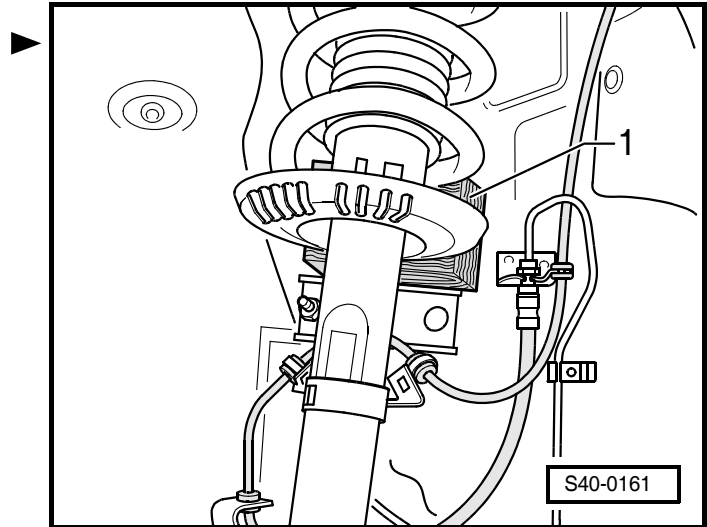
Vehicles fitted with C54-II floating caliper brake

- Release screws -1-.

Continued for all vehicles



- Remove brake caliper or brake carrier with brake caliper and secure with wire in such a way that the weight of the brake caliper does not pull on or damage the brake hose.
- Remove the drive shaft from wheel-bearing housing ⇒ Chapter 40-4 and tie up.
- Swivel out the wheel-bearing housing with the suspension strut and support with wooden insert -1-.
- Remove the track rod end from the steering-knuckle arm with extractor -Matra V176- and tie up the track rod.
- Screw out the Phillips head screws of the brake disc and remove brake disc.
- Remove the cover plate of the brake disc.
- Place the gearbox jack with adapter, e.g. -V.A.G 1383/A- with -V.A.G 1359/2- below (danger of having an accident): from parts which are falling when pulling out the wheel hub).



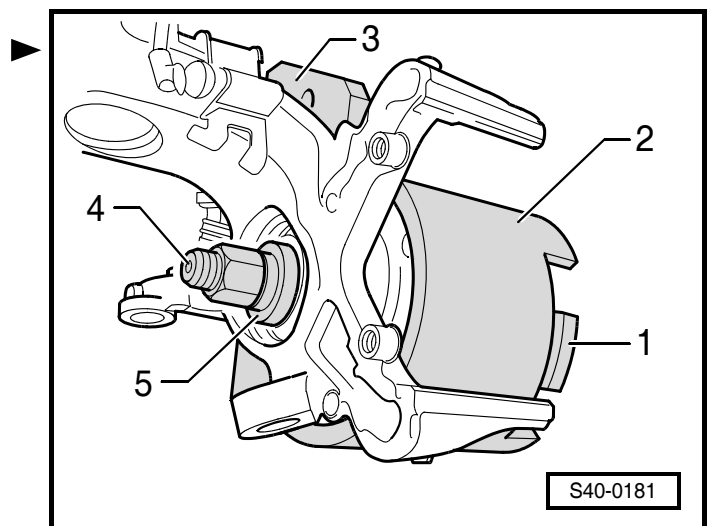
i Note

- ◆ The illustration shows the process of pulling out the wheel hub and wheel bearing at a wheel bearing housing for vehicle fitted with an FS-III brake.
 - ◆ The procedure for pulling out the wheel hub and wheel bearing of the chassis fitted with an FS-II or C54-II brake is similar to that for a chassis fitted with an FS-III brake even when the wheel bearing housing has a different appearance.
 - ◆ Mount the assembly device -MP 6-414- at right angles to the centre axle of the wheel hub with wheel bearing. Do not tilt the wheel hub with wheel bearing when removing and installing.
 - ◆ Three different variants are described below for pulling out the wheel bearing with wheel hub.
- Insert the side door removal tool -3- between the wheel-bearing housing and the wheel hub as support for the assembly device -2-.
 - Pull the wheel hub with wheel bearing out of the wheel-bearing housing.

- 1 - -MP 6-414/2- with -MP 6-414/5-
- 2 - -MP 6-414/1-
- 3 - -MP 8-605/1-
- 4 - -MP 6-414/10-
- 5 - -MP 6-414/6-

i Note

- ◆ Instead of the side door removal tool -MP 8-605/1- use 2 bases with a thickness of approx. 25 mm, a height of approx. 40 mm and a length of approx. 220 mm between the wheel-bearing housing and the

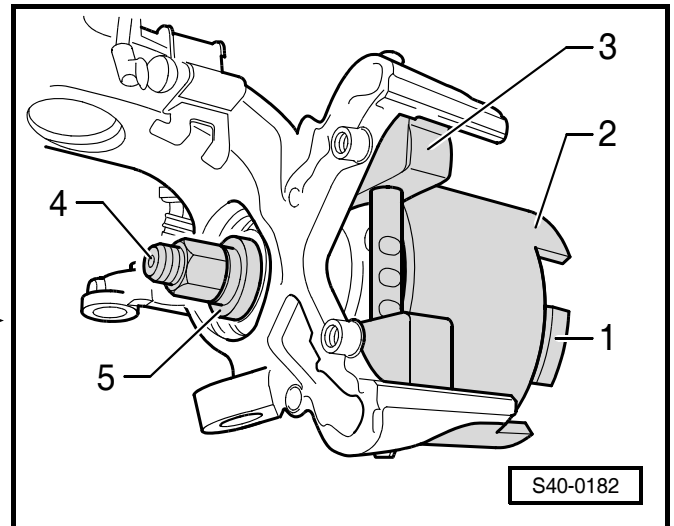


wheel hub as support for the assembly device -MP 6-414-. The arrangement is similar to separating device - E-37- ⇒ 40-3 page 13.

- ◆ If the separating device -E-37- from the supplementary tool kit -V.A.G 1459 B/2- is available then this can also be used as a support. Please note the correct installed position while doing this. The straight surfaces of the cutting edges must point towards the wheel hub.

- Insert separating device -3- between the wheel-bearing housing and the wheel hub and take up the weight.
- Pull the wheel hub with wheel bearing out of the wheel-bearing housing.

- 1 - -MP 6-414/2- with -MP 6-414-
- 2 - -MP 6-414/1-
- 3 - Separating device -E-37- from -V.A.G 1459 B/2-
- 4 - -MP 6-414/10-
- 5 - -MP 6-414/6-

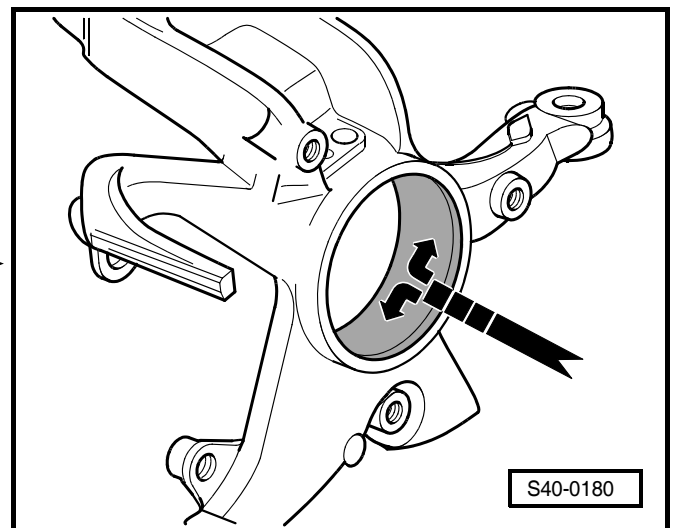


Inserting a wheel hub with wheel bearing



Note

- ◆ Figure S40-0180 shows the wheel bearing housing for the chassis with the FS-III brake. The procedure for cleaning and greasing the holes on wheel bearing housings for a chassis with FS-II or C54-II brakes is similar to that on a chassis with an FS-III brake.
- ◆ Clean the bore holes on the wheel bearing housing.
- ◆ Coat the bore with molykote grease -G 052 723 A2- over the entire surface.
- ◆ Screw the grippers -1- to the wheel hub with wheel bearing -2-.



	Grippers -1-
Chassis with an FS-II brake	-T10064/5-
Chassis with an FS-III or C54-II brake	-T10064/6-



Note

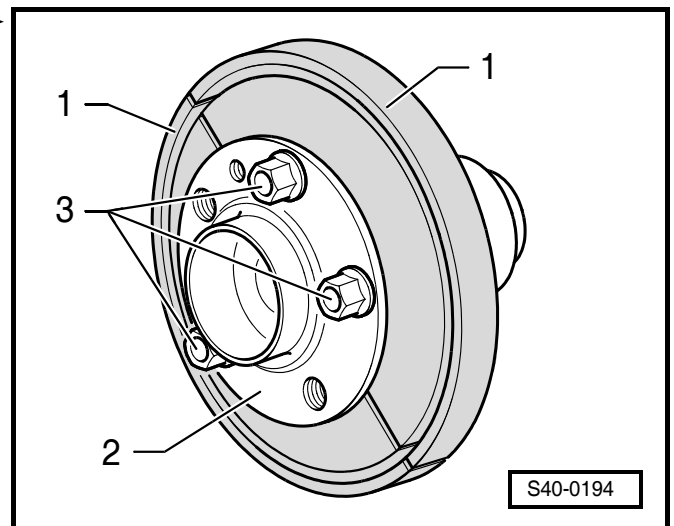
The wheel bolts -3- must not protrude from the rear of the grippers -1-.

Chassis with an FS-II brake



Note

Do not tilt the wheel hub with wheel bearing while inserting.



- Pull the wheel hub with wheel bearing into the wheel-bearing housing. ►

- 1 - -MP 6-414/5-
- 2 - -T10064/1-
- 3 - -T10064/5-
- 4 - -MP 6-414/10-
- 5 - -T10064/4-

Chassis with an FS-III or C54-II brake

Note

- ◆ *Figure S40-0183 shows the procedure for pulling in the wheel hub and wheel bearing on a wheel bearing housing for a chassis fitted with an FS-III brake.*
- ◆ *The selection and arrangement of special tools for pulling in the wheel hub with wheel bearing into the wheel bearing housing of a chassis fitted with an C54-II brake is similar to that for a chassis fitted with an FS-III brake.*
- ◆ *Do not tilt the wheel hub with wheel bearing while inserting.*

- Pull the wheel hub with wheel bearing into the wheel-bearing housing. ►

- 1 - -MP 6-414/5-
- 2 - -T10064/1-
- 3 - -T10064/6-
- 4 - -MP 6-414/10-
- 5 - -T10064/4-

Continued for all vehicles

- Pull in the wheel hub with wheel bearing until the cir-clip is heard to click into position.
- Screw out the grippers -1- from the wheel hub with wheel bearing -2-. ►

- 3 - Wheel bolts

Further installation occurs in reverse order, while paying attention to the following:

Vehicles with 13" running gear

- Smear the drive shaft lightly with adhesive sealing material -Loctite 601-.

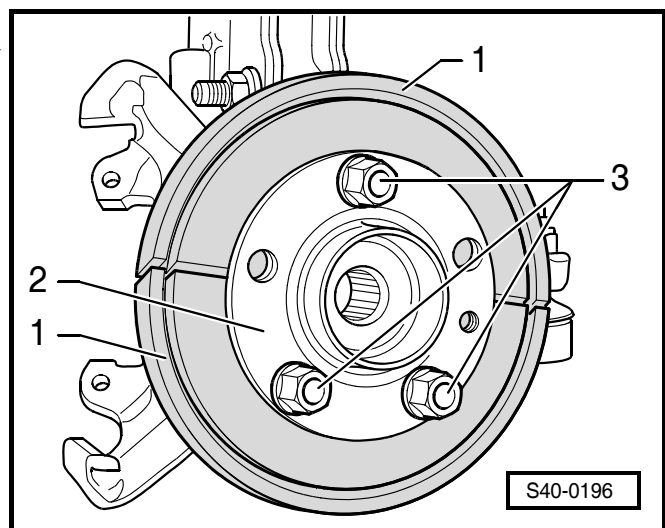
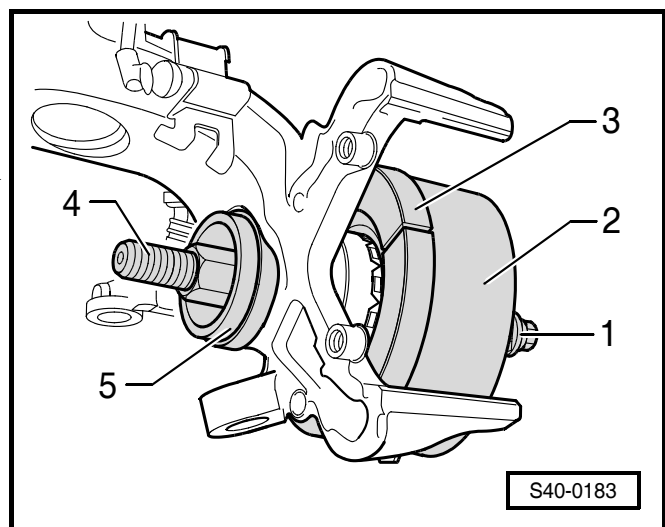
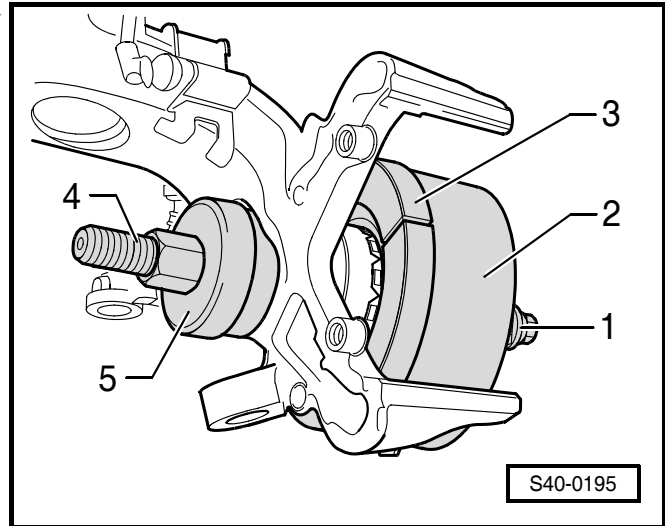
Do not grease thread on the outer joint of the drive shaft.

Vehicles with 14" and 15" running gear

- Grease the serration on the propeller shaft with poly-carbamide grease -GG 052 142 A2-.

Do not grease thread on the outer joint of the drive shaft.

- Grease the serration in the wheel hub with polycar-bamide grease -G 052 142 A2-.



Continued for all vehicles

- Insert the drive shaft in the wheel hub and screw on with new twelve-point nut.



Note

Always replace plate nuts of drive shaft on both sides by twelve-point nuts.

- Screw the steering joint and track control arm with the new screws in the former positions.
- Perform a test drive.



Caution!

If after the test drive and with the front wheels pointing straight ahead the steering wheel is off straight, perform a chassis alignment.

- Carry out check of chassis alignment ⇒ Chapter 44-2

Tightening torques:

Cover plate to wheel-bearing housing	10 Nm
Phillips head screw of brake disc to wheel hub with wheel bearing	4 Nm
Twelve-point nut of drive shaft to wheel hub 13" running gear ♦ Use new nuts! ♦ Do not grease thread of the outer joint of the drive shaft.	50 Nm
Twelve-point nut of drive shaft to wheel hub 14" and 15" running gear ♦ Use new nuts! ♦ Do not grease thread of the outer joint of the drive shaft.	50 Nm + 45°
Track rod/track rod end to steering lever ♦ Use new nuts!	20 Nm + 90°
Steering joint to track control arm ♦ Use new screws! ♦ Use new lock washer!	20 Nm + 90°
FS-III brake caliper to wheel bearing housing	28 Nm
FS-II brake caliper to wheel bearing housing	25 Nm
Brake carrier with C54-II brake caliper to wheel bearing housing	125 Nm
Coupling rod to anti-roll bar	40 Nm
Wheel bolts	120 Nm

40-4 Drive shafts with CV joints

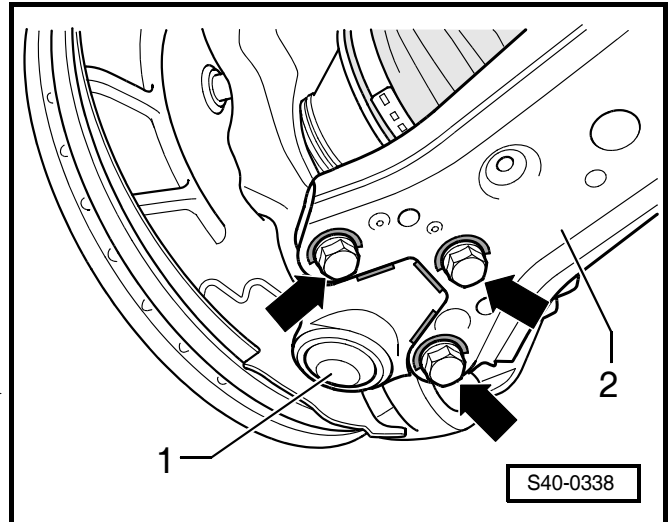
Removing and installing a drive shaft

Special tools, test and measuring equipment and auxiliary items required

- ◆ Extractor -MP 6-425-
- ◆ Polycarbamide grease -G 052 142 A2-
- ◆ Glue sealing mass -Loctite 601-
- ◆ A steel cylinder - max. \varnothing 18 mm, length 20 mm

Removing

- Raise the vehicle until the front axle is free of stress.
- Unscrew twelve-point nut (or the plate nut) from the drive shaft using a 19 mm Allen key.
- Removing noise insulation \Rightarrow Engine - Mechanics; Rep. Gr. 10.
- Unscrew the drive shaft from the flange shaft - gear-box, if necessary remove the heat shield below the inner joint.
- Remove front wheel.
- Mark fitting position of screws -arrows- from steering joint -1- to track control arm -2-.
- Mark installation position of the steering joint -1- for the track control arm -2-.
- Release screws -arrows-.
- Press out drive shaft with -MP 6-425-.
- Remove the drive shaft.



Installing

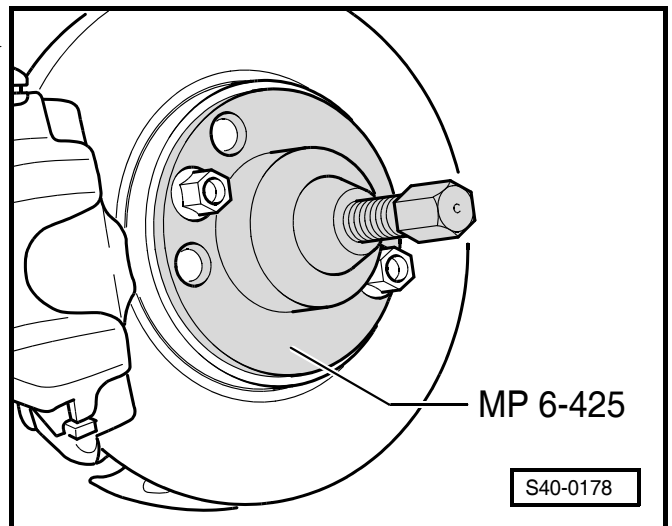


Note

Remove possible corrosion, grease or adhesive sealing material from the thread and from the serration of the outer joint as well as from the serration of the wheel hub.

Vehicles with 13" running gear

- Smear the gearing of the outer joint of the drive shaft lightly with adhesive sealing material -Loctite 601-.
- Do not grease thread on the outer joint of the drive shaft.



Vehicles with 14" and 15" running gear

- Grease the serration on the propeller shaft with polycarbamide grease -G 052 142 A2-.

Do not grease thread on the outer joint of the drive shaft.

- Grease the serration in the wheel hub with polycarbamide grease -G 052 142 A2-.

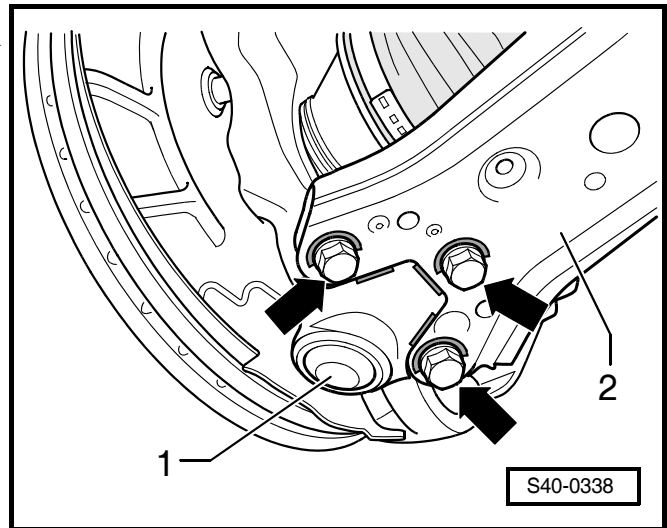
Continued for all vehicles

- Insert the drive shaft in the serration of the wheel hub.
- When inserting the drive shaft insert at the same time the steering joint -1- into the track control arm -2- in accordance with the former positions and markings.
- Screw the drive shaft onto the flange shaft - gearbox and initially tighten to 10 Nm.
- Secure the outer joint of the drive shaft with a new twelve-point nut.

i Note

Always replace plate nuts of drive shaft on both sides by twelve-point nuts. Replace nut on both sides.

- Tighten the drive shaft on the flange shaft - gearbox to the prescribed torque.
- Screw the track control arm -1- with the steering joint -2- with new screws -arrows- and new lock washer in accordance with the former positions and markings.
- Tighten the new screws -arrows- in accordance with the markings and the former positions to the specified tightening torque.



Further installation occurs in reverse order.

Tightening torques:

Drive shaft to flange shaft/gearbox ◆ Use new screws!	M 8 = 40 Nm M 10 = 70 Nm
Twelve-point nut of drive shaft to wheel hub 13" running gear ◆ Use new nut! ◆ Do not grease thread of the outer joint of the drive shaft.	50 Nm
Twelve-point nut of drive shaft to wheel hub 14" and 15" running gear ◆ Use new nut! ◆ Do not grease thread of the outer joint of the drive shaft.	50 Nm + 45°
Steering joint to track control arm ◆ Use new screws! ◆ Use new lock washer!	20 Nm + 90°
Wheel bolts	120 Nm

Summary of components of drive shaft with CV joint

Grease quality and grease quantity

i Note

- ◆ The outer joints of the drive shaft are filled with grease for operating at normal temperatures, e.g. -N 052 738 00-.
- ◆ Only use the appropriate high-temperature grease from the relevant repair kit for the grease filling of the CV joint ⇒ Spare Parts catalogue.

Outer joint Ø mm	Grease Total amount [g]	of which in:	
		Joint [g]	Joint boot [g]
90	80 +10	80 +10	---
100	100 +10	100 +10	---
Inner joint Ø mm			
90	80 +10	40 +5	40 +5
100	110 +10	55 +5	55 +5



Note

- ◆ Assignment of the drive shafts ⇒ Spare part catalogue.
- ◆ Grease joint if necessary, when replacing the joint boot.
- ◆ Spread the grease mass evenly in the joint boot.

1 - Right joint boot (tubular shaft)

- assignment ⇒ Spare part catalogue

2 - Screw

- replace after each removal
- initially tighten to 10 Nm, subsequently tighten cross-wise to final torque:

M 10 = :

For vehicles ► 04.03

70 Nm

For vehicles 05.03 ►

Tighten 50 Nm + 45°

M 8 = :

For vehicles ► 04.03

40 Nm

For vehicles 05.03 ►

Tighten 20 Nm + 90°

- assignment ⇒ Spare part catalogue

3 - Shim

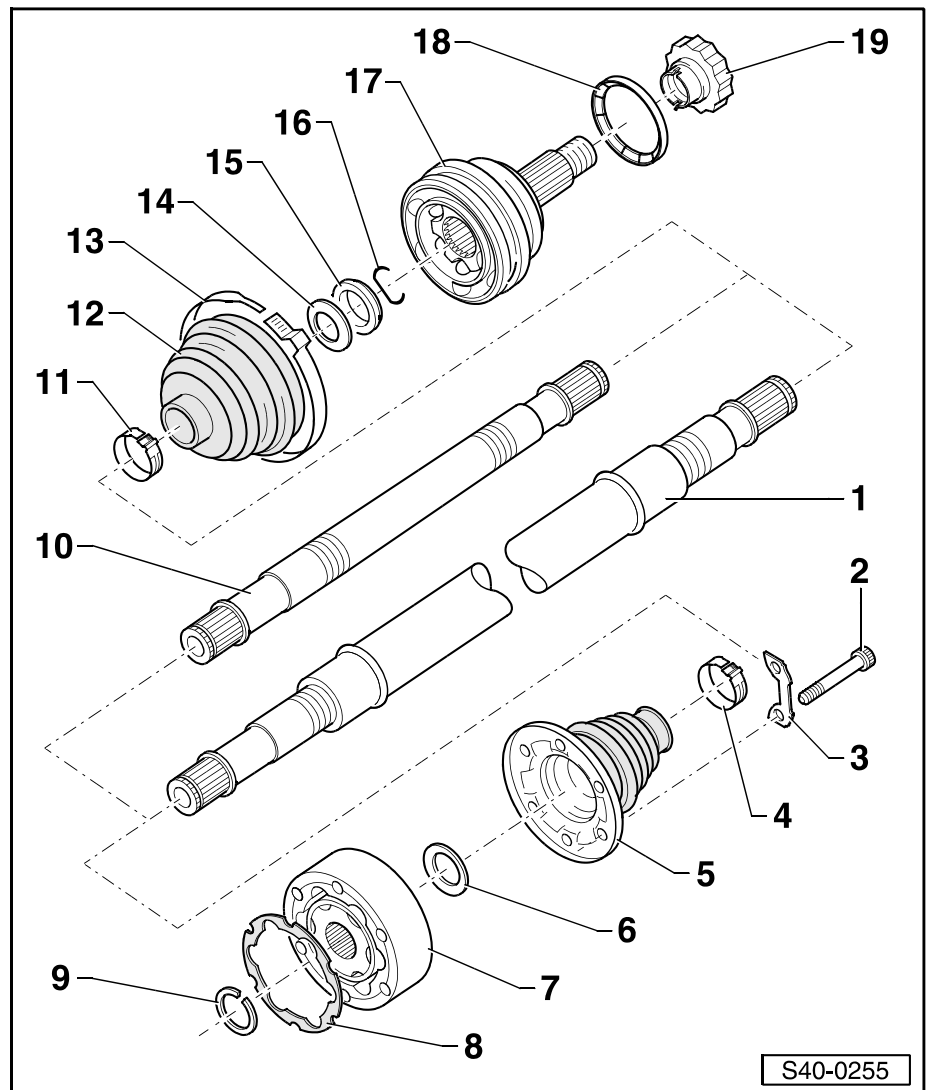
- assignment ⇒ Spare part catalogue

4 - Warm-type clamp

- replace
- tensioning ⇒ 40-4 page 5

5 - Joint boot for inner CV joint

- Material: Hytel (Polyelastomere)
- inspect for tears and chafing points
- remove from CV joint with drift
- before installation coat the inside of the cap with sealant -D 454 300 A2-
- assignment ⇒ Spare part catalogue



6 - Disc spring

- Fitting position ⇒ 40-4 page 6

7 - Inner CV joint

- must be replaced completely
- pressing off ⇒ 40-4 page 6
- pressing on ⇒ 40-4 page 6
- grease ⇒ 40-4 page 2
- check ⇒ 40-4 page 8
- assignment ⇒ Spare part catalogue

8 - Gasket

- The adherend must be free of grease and oil!
- replace
- Pull off protective foil and stick in housing
- assignment ⇒ Spare part catalogue

9 - Circlip

- replace
- use circlip pliers, e.g. -VW 161 A- for removing and installing
- assignment ⇒ Spare part catalogue

10 - Left drive shaft (solid shaft)

- assignment ⇒ Spare part catalogue

11 - Warm-type clamp

- replace
- tensioning ⇒ 40-4 page 5

12 - Joint boot

- Material: Hytrel (Polyelastomere)
- inspect for tears and chafing points

13 - Warm-type clamp

- replace
- tension with tensioning pliers, e.g. -V.A.G 1682 - ⇒ 40-4 page 5

14 - Disc spring

- Fitting position ⇒ 40-4 page 5

15 - Thrust ring

- Fitting position ⇒ 40-4 page 5

16 - Circlip

- replace
- insert in the shaft groove

17 - Outer CV joint

- must be replaced completely
- removing ⇒ 40-4 page 5
- before installing grease the serration with polycarbamide grease -G 052 142 A2-
- Installing: drive onto the shaft with a plastic hammer until the compressed circlip expands
- grease ⇒ 40-4 page 2
- check ⇒ 40-4 page 7
- assignment ⇒ Spare part catalogue

18 - Thrower ring

- 13" chassis - black
- 14" and 15" chassis - white

19 - Twelve-point nut

- 13" chassis - black, 50 Nm
- 14" and 15" chassis - silvery, 50 Nm + 45°
- replace after each removal

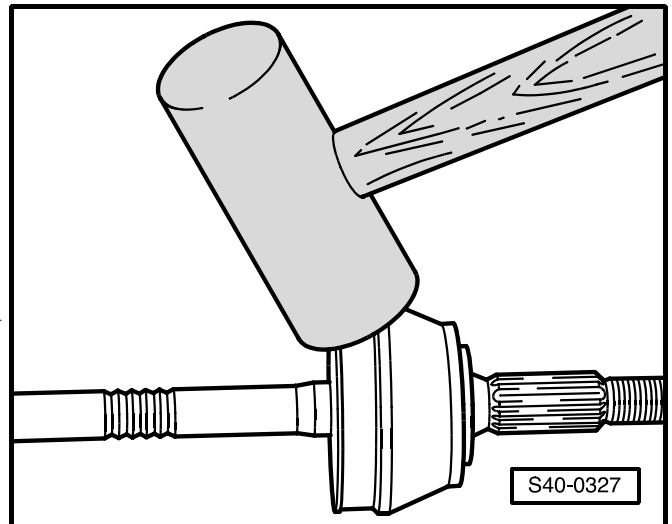
Repairing drive shaft with CV joint

Special tools, test and measuring equipment and auxiliary items required

- ◆ Pressure plate -MP 3-406-
- ◆ Pressure plate -MP 3-407-
- ◆ Thrust piece -MP 3-448-
- ◆ Strutting bushing -MP 6-428-
- ◆ Clamping device -MP 6-429-
- ◆ Workshop press, e.g. -V.A.G 1290 A-
- ◆ Tensioning pliers, e.g. -V.A.G 1682-
- ◆ Sealant -D 454 300 A2-

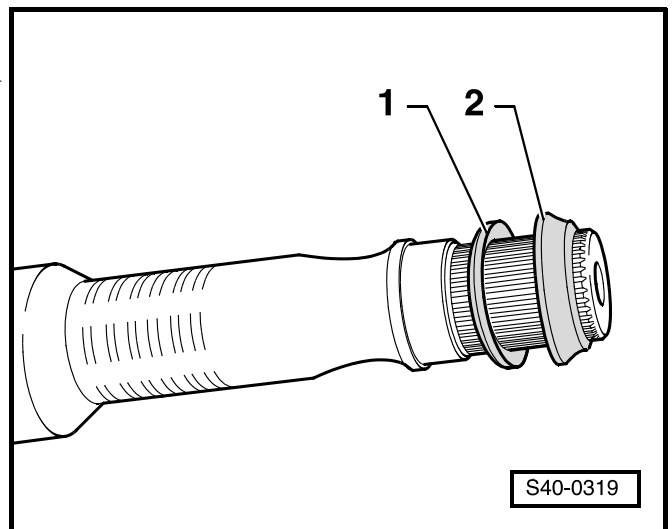
Removing outer CV joint

- Removing drive shaft ⇒ 40-4 page 1.
- Remove the joint boot.
- Drive the CV joint off the drive shaft with a strong blow of a plastic hammer. ►
- Remove circlip ⇒ item 16 in 40-4 page 4.
- Remove the disc spring and thrust ring from the drive shaft.



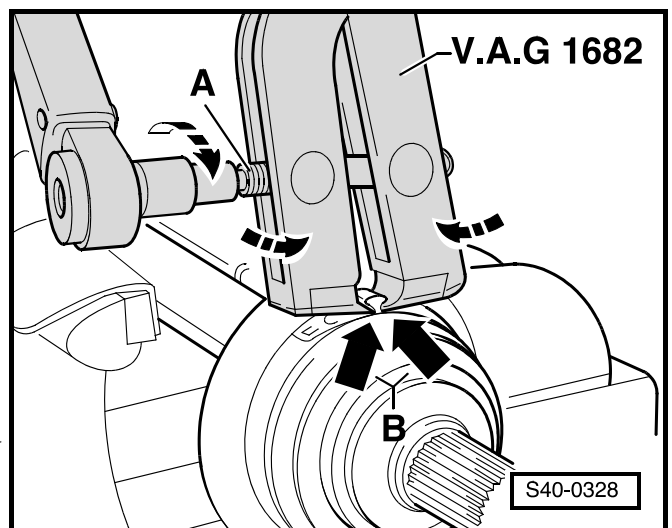
Installing the inner CV joint

- Push the new joint boot onto the drive shaft.
- Fit the disc spring -1- and the thrust ring -2- onto the drive shaft. ►
- Check fitting position.
- Insert new circlip in the groove of the drive shaft.
- Carefully drive CV joint onto the drive shaft with a plastic hammer until the compressed circlip expands.
- Grease the CV joint and the joint boot ⇒ 40-4 page 2.
- Fit joint boot on the outer joint.
- Install drive shaft ⇒ 40-4 page 1.



Note

- ◆ *In view of the hard material (as opposed to rubber) of the joint boot, which requires the use of a stainless steel-open warm-type clamp, the latter can only be tightened with tensioning pliers, e.g. -V.A.G 1682-.*
- ◆ *Tightening torque 20 Nm.*
- ◆ *Make sure the thread of spindle -A- of the pliers is smooth. If necessary grease with molykote grease, e.g. MoS₂.*
- ◆ *If it is not smooth, e.g. if the thread is dirty, the necessary clamping force of the open warm-type clamp is not reached at the given torque.*
- Tighten the open warm-type clamp on the outer joint ► (at the large diameter).



- Apply tensioning pliers, e.g. -V.A.G 1682- as shown. Make sure the cutting edges of the pliers are positioned in the corners -arrows B- of the warm-type clamp.
- Tighten the warm-type clamp by turning the spindle with a torque wrench. Do not tilt the pliers during this process.

A - Spindle of tensioning pliers

B - Cutting edges of tensioning pliers

- Tighten the warm-type clamp at the small diameter
- Apply tensioning pliers, e.g. -V.A.G 1682- as shown. Make sure the cutting edges of the pliers are positioned in the corners -arrows B- of the warm-type clamp.
- Tighten the warm-type clamp by turning the spindle with a torque wrench. Do not tilt the pliers during this process.

A - Spindle of tensioning pliers

B - Cutting edges of tensioning pliers

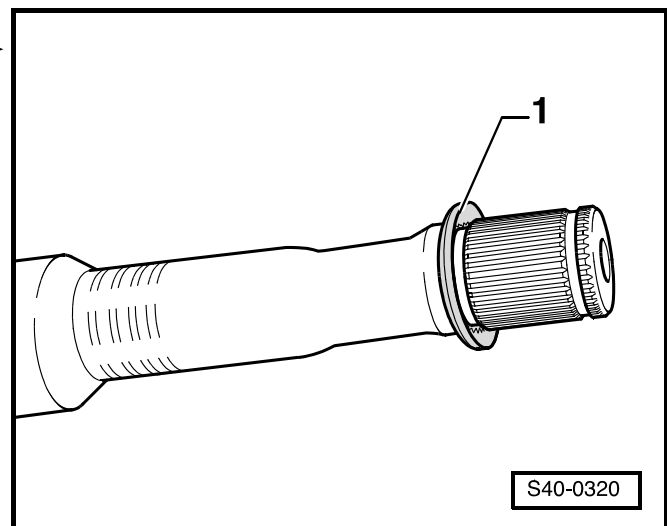
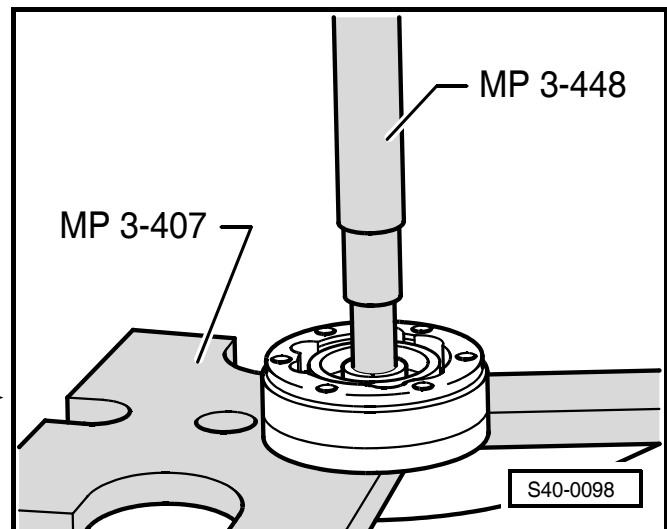
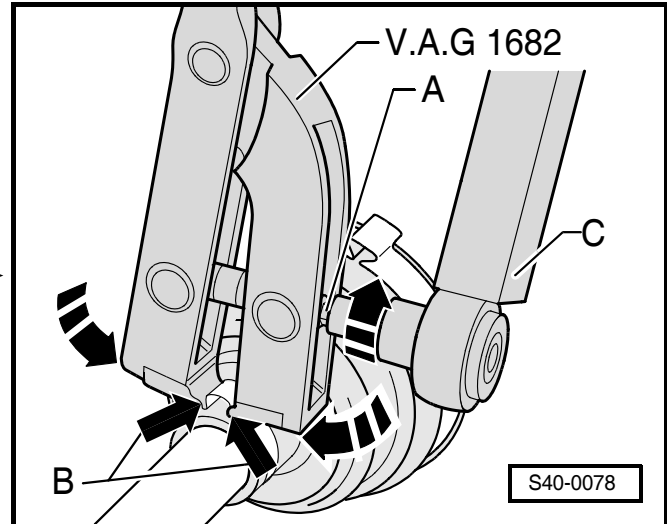
C - Torque wrench

Removing inner CV joint

- Removing drive shaft ⇒ 40-4 page 1.
- Open warm-type clamp.
- Remove joint boot from CV joint with drift.
- Remove the circlip from the drive shaft.
- Press CV joint off the drive shaft.
- Do this while supporting the ball joint.
- Remove the disc spring from the drive shaft.

Installing the inner CV joint

- Fit the disc spring -1- onto the drive shaft. Check fitting position.



- Push the new joint boot onto the drive shaft.
- Press CV joint onto the drive shaft up to the stop.

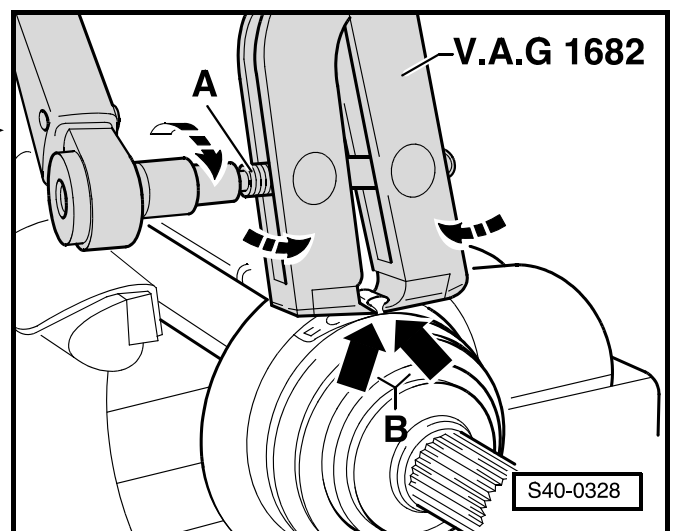
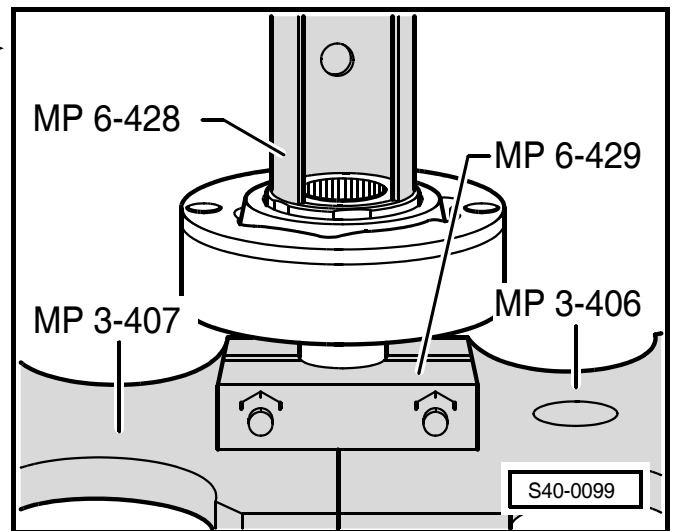
i Note

Chamfer on inner diameter of the ball hub (serration) must point towards the bearing collar of the drive shaft.

- Fit new circlip on the drive shaft. For this use e.g. the circlip pliers -VW 161 A-.
- Coat the edge of the inner joint boot cap with sealant -D 454 300 A2-.
- Fit joint boot on the constant velocity joint.

i Note

- ◆ *In view of the hard material (as opposed to rubber) of the joint boot, which requires the use of a stainless steel-open warm-type clamp, the latter can only be tightened with tensioning pliers, e.g. -V.A.G 1682-.*
- ◆ *Tightening torque 20 Nm.*
- ◆ *Make sure the thread of spindle -A- of the pliers is smooth. If necessary grease with molykote grease, e.g. MoS₂.*
- ◆ *If it is not smooth, e.g. if the thread is dirty, the necessary clamping force of the open warm-type clamp is not reached at the given torque.*

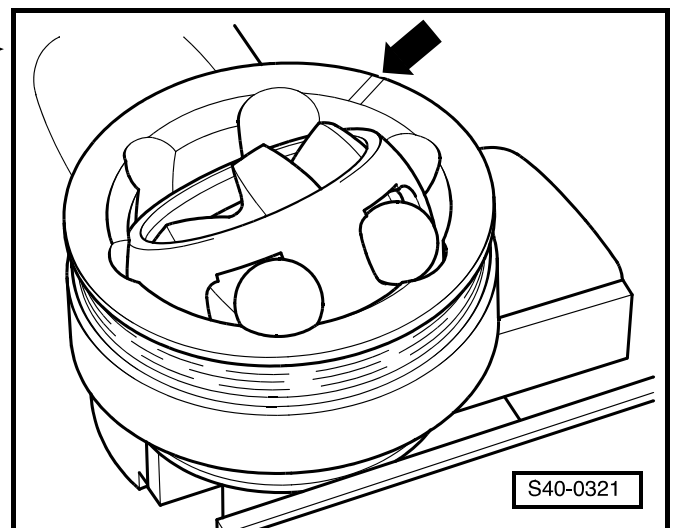


Inspecting a CV joint

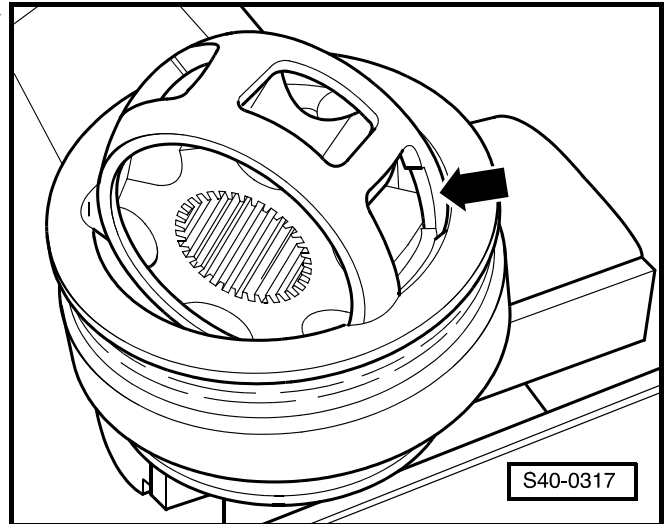
Disassembling and inspecting the outer CV joint

Disassemble the joint to replace badly soiled grease or if the contact surfaces of the balls must be inspected for wear and damage.

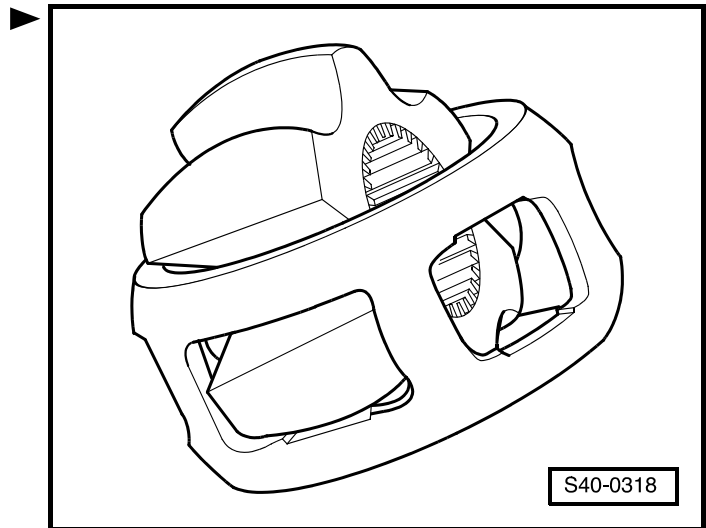
- With an electric stylus or rubstone mark the position of the ball hub relatively to the ball cage and housing before disassembling -arrow-.
- Rotate the ball hub and ball cage.
- Remove the balls one after the other.



- Turn the cage until two rectangular cage windows -arrow- rest on the joint part.
- Remove cage with hub.



- Turn the hub segment in opening of the cage.
- Tilt hub out of cage.



i Note

- ◆ *The 6 balls of each joint belong to a tolerance group. Inspect the axle studs, hub, cage and balls for small depressions (pitting = point erosion) and seizing marks. Load alteration shocks indicate too much torsional clearance in the joint. If this is the case, replace the joint. Smoothing and bearing marks do not justify a joint replacement.*
- ◆ *Inspect the cage for tears.*

Assembling the outer CV joint

- Install drive shaft ⇒ 40-4 page 1.
- Press the required grease mass into the joint part ⇒ 40-4 page 2
- Insert the cage and hub in the joint body.

i Note

The cage must be inserted in the correct position.

- Press in opposite balls one after the other, during this process observe the prior position of the ball hub relatively to the ball cage and to the joint part.
- Insert new circlip in the groove of the shaft.
- Spread any residual grease in the joint boot ⇒ 40-4 page 2.
- Installing the joint boot ⇒ 40-4 page 5.

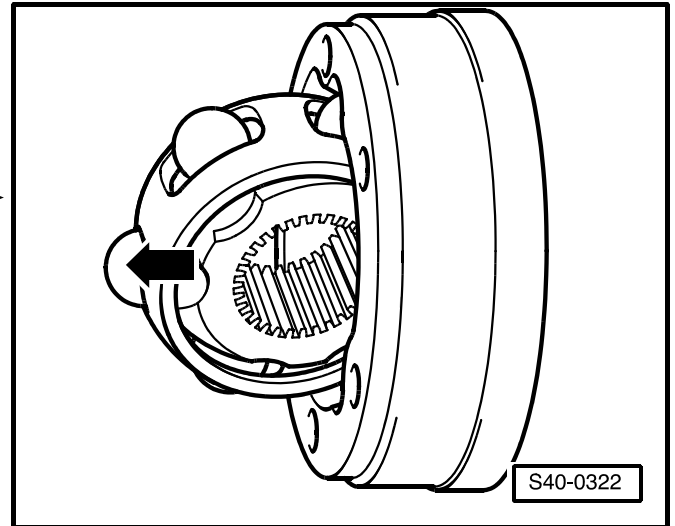
Disassembling and inspecting the inner CV joint

Disassemble the joint to replace badly soiled grease or if the contact surfaces of the balls must be inspected for wear and damage.

i Note

The ball hub and joint piece are paired and must be marked before disassembly. Do not interchange the bearing track assignment.

- Rotate the ball hub and ball cage.
- Press the ball hub and ball cage out of the joint part in the direction of the arrow.
- Press out the balls from the cage.



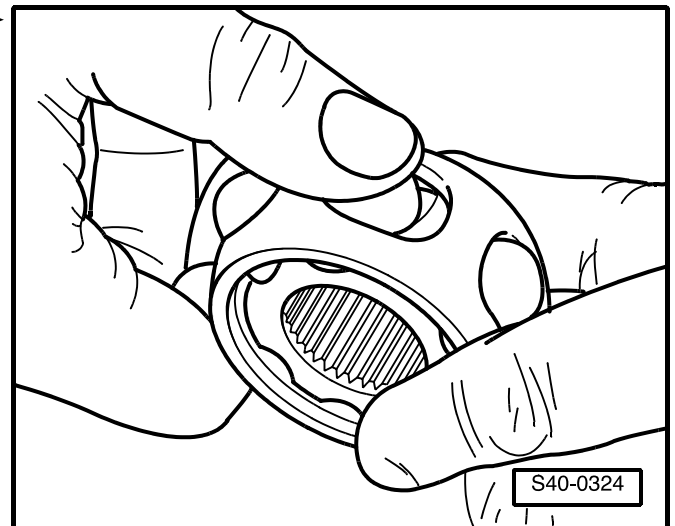
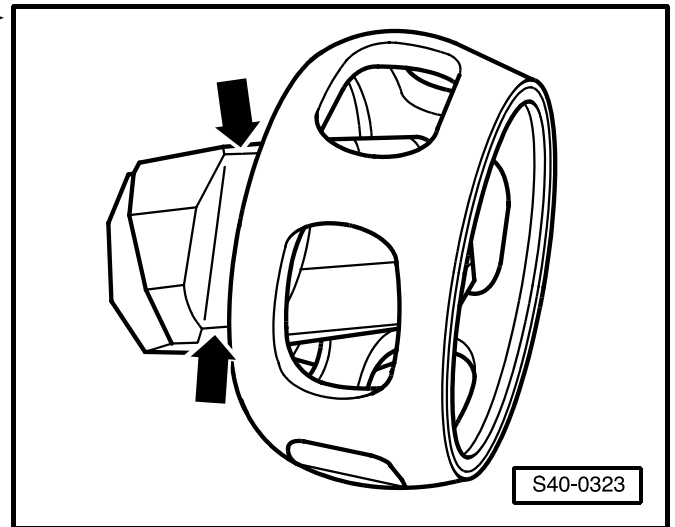
- Tilt the ball hub out of the ball cage over the ball bearing track -arrows-.
- Inspect the joint part, ball hub, ball cage and balls for small broken out depressions (pitting = point corrosion) and seizing marks.

i Note

Load alteration shocks indicate too much torsional clearance in the joint. If this is the case, replace the joint. Smoothing and bearing marks do not justify a joint replacement.

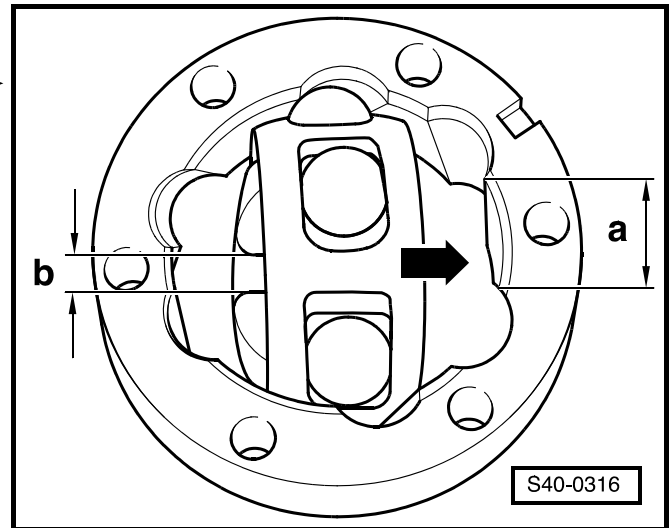
Assembling the inner CV joint

- Insert the ball hub in the ball cage over the two chamfers. The fitting location is random. Press the balls into the cage.
- Insert the hub with cage upright into the joint part.

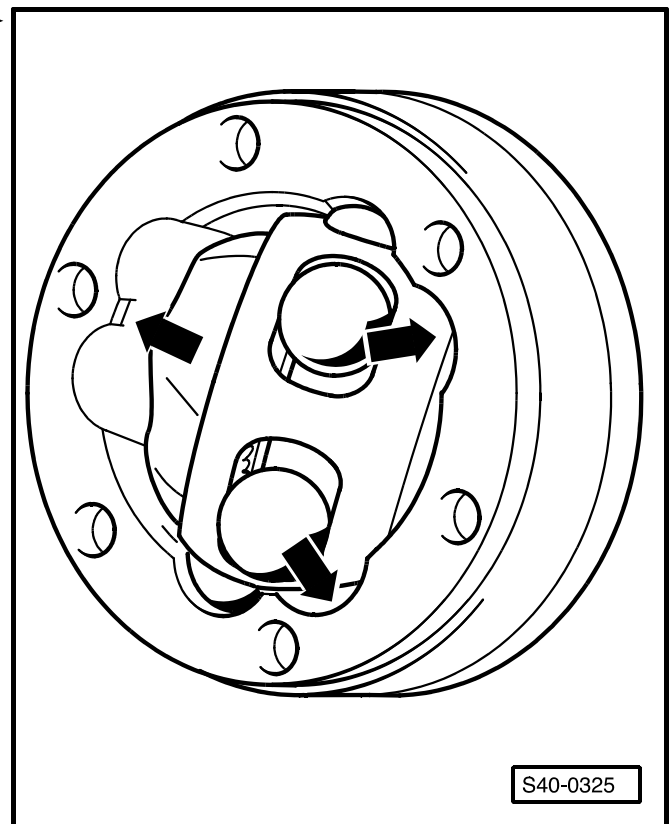


i Note

When inserting make sure the greatest distance -a- on the joint part is close to the short distance -b- on the hub after it has been swivelled in -arrow-.



- Swivel in the ball hub, to do so swivel the hub out of the cage -arrows- until the balls are at bearing track distance.

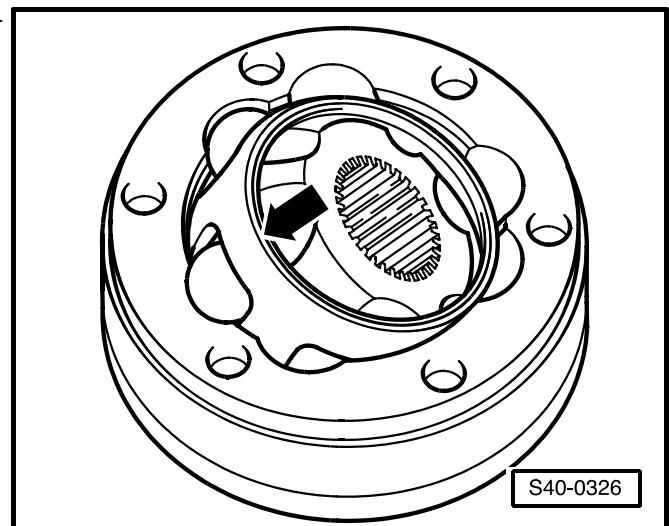


- Lock the hub with the balls into position by exerting considerable pressure on the cage -arrow-.

Inspecting the operation of the CV joint

The CV joint is correctly assembled if the ball hub can be rolled by hand up and down the entire linear compensation.

- Install drive shaft ⇒ 40-4 page 5.
- Press the required grease mass into the joint part ⇒ 40-4 page 2
- Spread any residual grease in the joint boot ⇒ 40-4 page 2.
- Installing the joint boot ⇒ 40-4 page 5.



40-5 Drive shafts with tripod joint

Removing and installing a drive shaft

⇒ Chapter 40-4

V - Summary of components of drive shaft with AAR2000 tripod joint

Grease quality and grease quantity



Note

- ◆ *The outer joints of the drive shaft must be filled with grease for operating at normal temperatures, e.g. -N 052 738 00-.*
- ◆ *Only use high-temperature grease from the relevant repair kit for filling the CV joint ⇒ Spare Parts catalogue.*

Outer joint Ø mm	Grease Total amount [g]	of which in:	
		Joint [g]	Joint boot [g]
100	100 ⁺¹⁰	100 ⁺¹⁰	---
Tripod joint Ø mm			
108	110 ⁺⁵	110 ⁺⁵	---



Note

- ◆ *Assignment of the drive shafts ⇒ Spare part catalogue*
- ◆ *Grease joint if necessary, when replacing the joint boot.*
- ◆ *On tripod joints only apply grease in the joint; the grease should never get in the grease boot. Of all of the grease used, half should be pressed into the front side of the joint and the other half on the rear side of the tripod joint.*

1 - Joint boot for the joint

- inspect for tears and chafing points
- assignment ⇒ Spare part catalogue

2 - Warm-type clamp

- replace
- tensioning ⇒ Chapter 40-4

3 - Screw

- replace after each removal
- initially tighten to 10 Nm, subsequently tighten cross-wise to final torque:

M 10 = :

For vehicles > 04.03
70NmFor vehicles 05.03 >
Tighten 50 Nm + 45°
M 8 = :For vehicles > 04.03
40NmFor vehicles 05.03 >
Tighten 20 Nm + 90°

- assignment ⇒ Spare part catalogue

4 - Shim

- assignment ⇒ Spare part catalogue

5 - Joint part

- grease ⇒ 40-5 page 1
- assignment ⇒ Spare part catalogue

6 - Tripod spider with rollers

- Chamfer -arrow- points towards the drive shaft serration

7 - Circlip

- replace
- insert in the shaft groove

8 - O-ring seal

- replace

9 - Cover

- replace

10 - Hose clamp

- for tripod joint
- replace
- tensioning ⇒ 40-5 page 5

11 - Joint boot for tripod joint

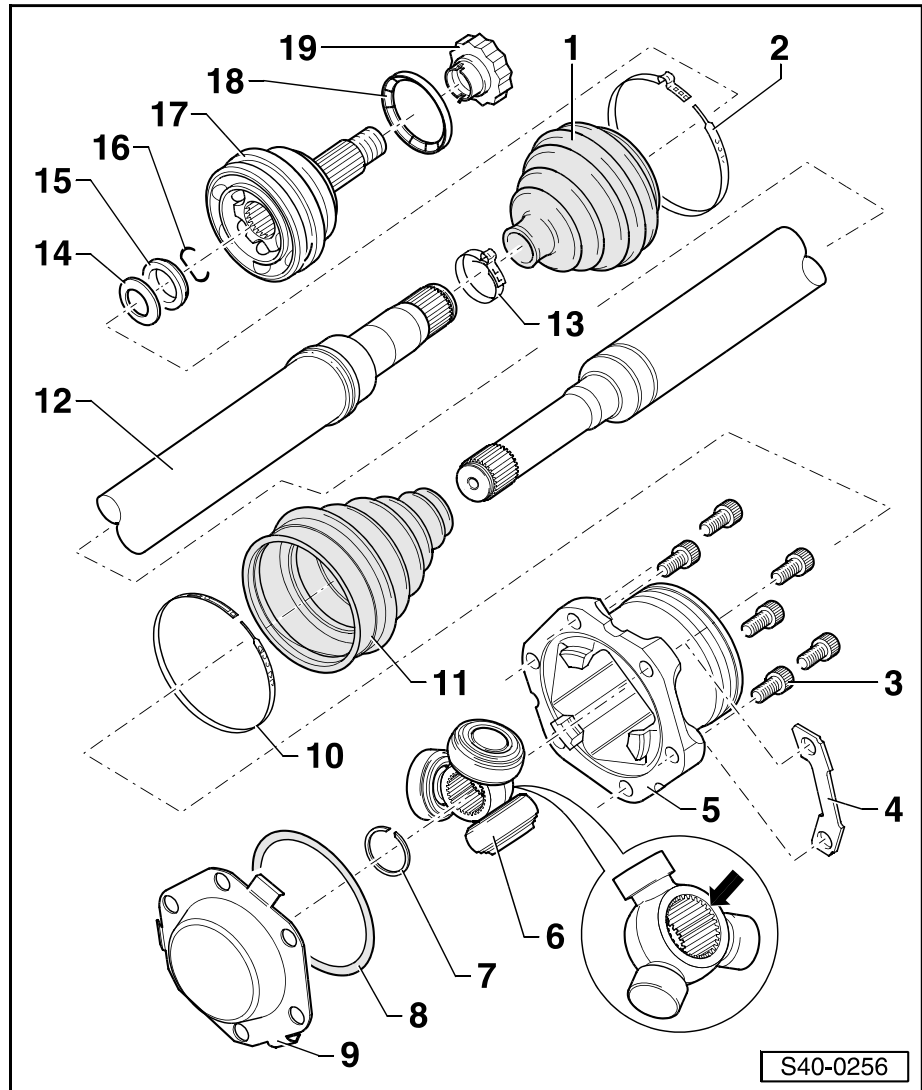
- inspect for tears and chafing points
- assignment ⇒ Spare part catalogue

12 - Drive shaft

- assignment ⇒ Spare part catalogue

13 - Warm-type clamp

- replace
- tensioning ⇒ Chapter 40-4



14 - Disc spring

- Fitting location ⇒ Chapter 40-4

15 - Thrust ring

- Fitting location ⇒ Chapter 40-4

16 - Circlip

- replace
- insert in the shaft groove

17 - Outer CV joint

- must be replaced completely
- removing ⇒ Chapter 40-4
- Installing: carefully drive onto the shaft with a plastic hammer until the compressed circlip expands
- greasing ⇒ Chapter 40-4
- inspect ⇒ Chapter 40-4
- Do not grease thread of the outer joint of the drive shaft.
- assignment ⇒ Spare part catalogue

18 - Thrower ring

- 13" chassis - black
- 14" and 15" chassis - white

19 - Twelve-point nut

- 13" chassis - black, 50 Nm
- 14" and 15" chassis - silvery, 50 Nm + 45°
- replace after each removal

Inspecting outer CV joint

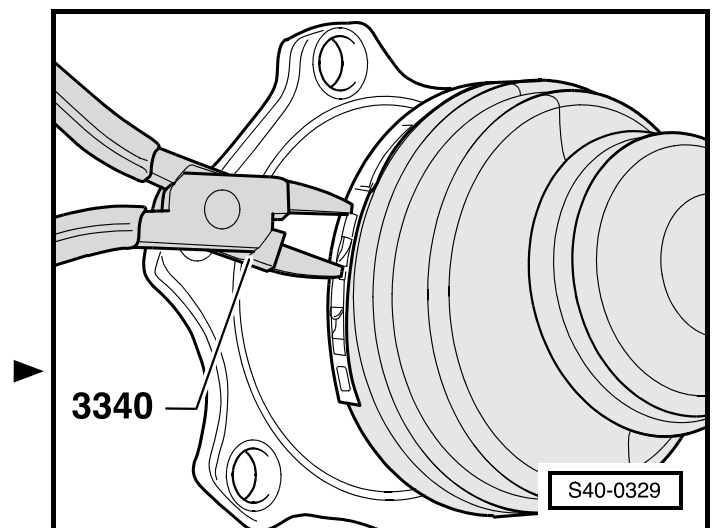
⇒ Chapter 40-4

Repairing the drive shaft with AAR 2000 tripod joint**Special tools, test and measuring equipment and auxiliary items required**

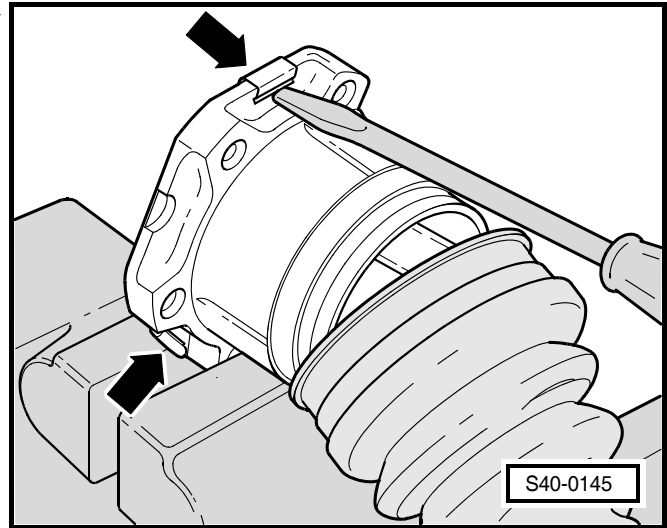
- ◆ Pressure plate -MP 3-406-
- ◆ Pressure plate -MP 3-407-
- ◆ Thrust piece -MP 3-408-
- ◆ Distance sleeve -MP 3-458/2-
- ◆ Thrust piece -MP 6-405-
- ◆ Strutting bushing -MP 6-428-
- ◆ Clamping device -MP 6-429-
- ◆ Pliers -3340-
- ◆ Circlip pliers (commercially available)
- ◆ Workshop press, e.g. -V.A.G 1290 A-

Disassembling the AAR 2000 tripod joint

- Removing the drive shaft ⇒ Chap. 40-4.
- Open hose clamp on joint part.



- Straighten the metal tabs -arrows- with a screwdriver and lever off cover. ►

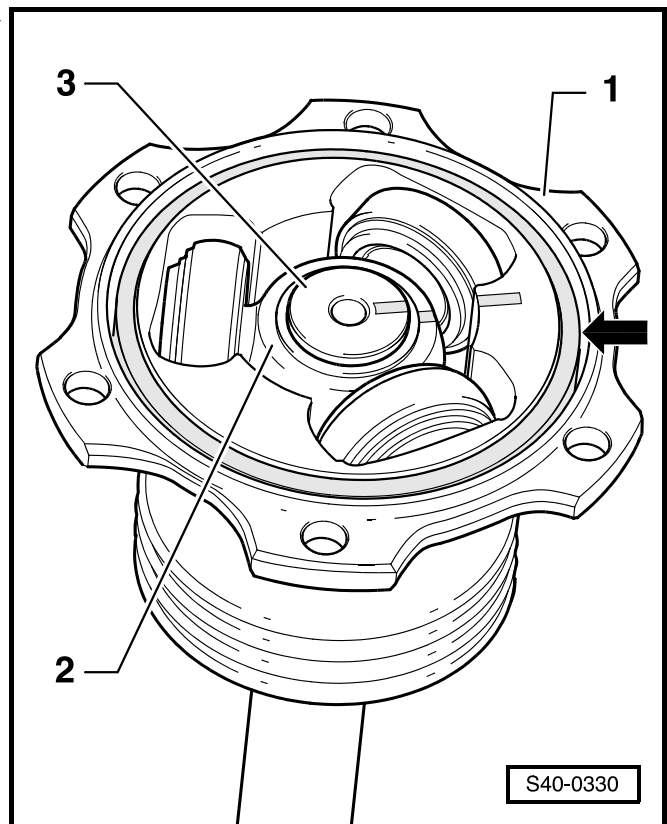


- Remove O-ring seal -arrow- from the slot. ►
- Mark the fitting position of parts -1...3-.

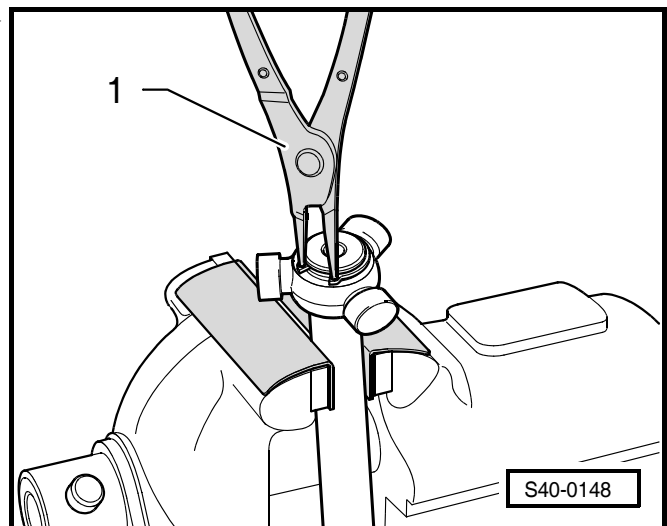
- 1 - Joint part
- 2 - Tripod spider
- 3 - Drive shaft

i Note

- ◆ *If parts -1...3- are not marked and if they are not fitted in their original position again this could cause noises during driving at a later stage.*
- ◆ *Use a waterproof marker for marking.*



- Clamp the drive shaft in a vice with protective jaws. ►
- Removing the circlip.
 - 1 - Circlip pliers (commercially available)



- Hold the joint part and remove drive shaft from the vice.
- Insert the drive shaft in the press.
- Hold the drive shaft and push tripod spider off the drive shaft. ►
- Remove the tripod spider with rollers and lay aside on a clean surface.
- Remove the joint part from the drive shaft.
- Remove the joint boot from the drive shaft.
- Clean the drive shaft and the joint part.

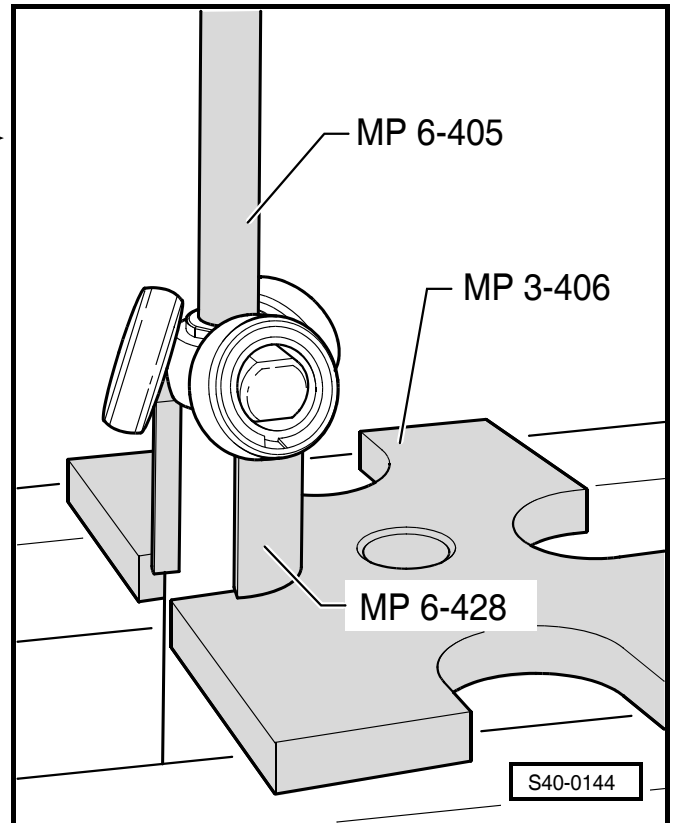
Assembling the AAR 2000 tripod joint

- Insert the joint boot on the drive shaft.
- Insert the joint part on the drive shaft.

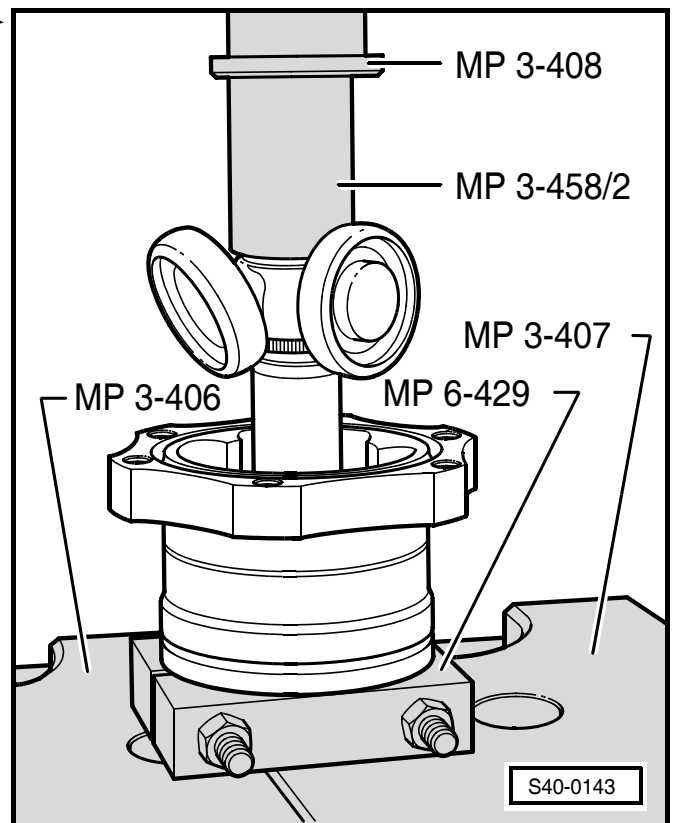


Note

Chamfer on the tripod spider must point towards the drive shaft. Chamfer serves as an assembly aid ⇒ item 6 in 40-5 page 2.



- Position the tripod spider on the drive shaft according to the markings and press on up to the stop. ►
- Insert new circlip and pay attention to correct position.
- Slide the joint part over the rollers and hold down.
- Remove the drive shaft from the special tool and clamp in the vice.



- Press 60 grams of -Hochtemperaturfett- from the repair kit into the tripod joint (on the tripod spider side) -arrow A-.
- Press 60 grams of -Hochtemperaturfett- from the repair kit in the rear of the tripod joint -arrow B-.
- Installing the joint boot.

i Note

The bead in the joint boot must fit into the groove of the joint part.

- Remove drive shaft from the vice and clamp the joint part.
- Insert new gasket ring -arrow- from the repair kit in the groove.
- Fit the new cover on the joint part.

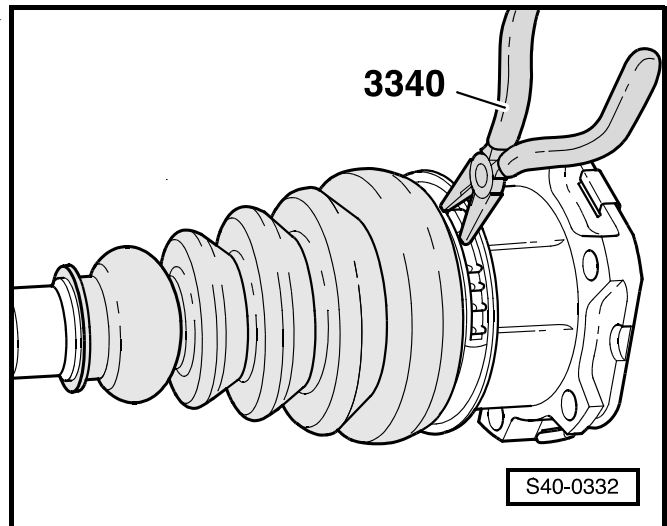
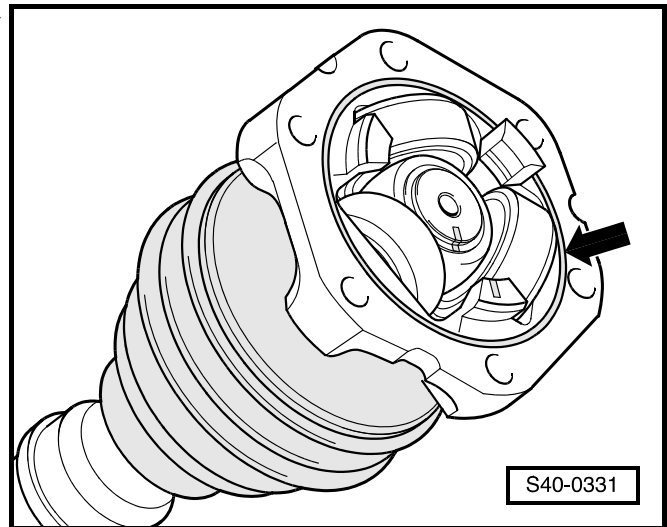
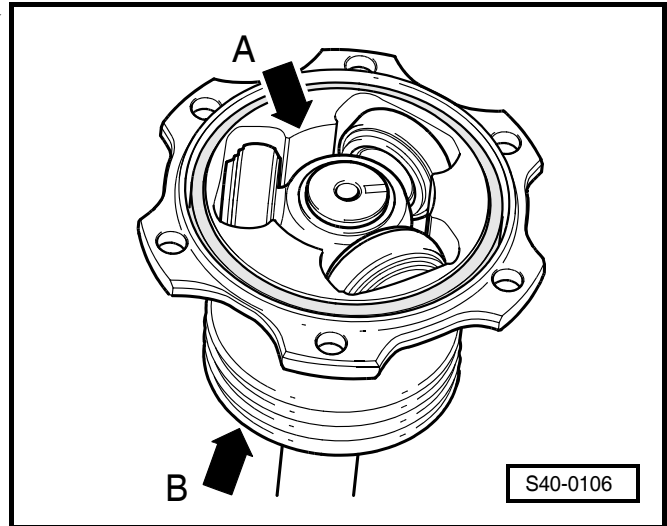
i Note

The bores of the cover and joint part must be flush.

- Fit the hose clamp.

Removing and installing the outer CV joint

⇒ Chapter 40-4



42 – Rear wheel suspension

42-1 Rear axle with drum brake

Summary of components of rear axle



Note

- ◆ *Welding and straightening on axle body and axle studs not allowed.*
- ◆ *Always replace the self-locking nuts and bolts.*
- ◆ *Always replace corroded self-locking nuts and screws.*
- ◆ *Generally tighten the brake line pipe screws to a tightening torque of 14 Nm.*

1 - Wheel bolt, 120 Nm

- Allocation ⇒ Spare parts catalogue

2 - Screw, 4 Nm

3 - Brake drum

- reset brake before removing the brake drum ⇒ Chapter 46-2

4 - Cap

- replace after each removal
- pressing off and inserting ⇒ Chapter 42-5

5 - Twelve-point nut, self-locking, 70 Nm and turn a further 30° (1/12 turn)

- replace after each removal

6 - Wheel hub with wheel bearing

- for vehicles with ABS the sensor ring is built into the wheel hub
- wheel hub and wheel bearing form one unit; it does not need servicing.
- the sensor ring for ABS cannot be replaced individually
- removing and installing ⇒ Chapter 42-5
- Allocation ⇒ Spare parts catalogue

7 - Screw, 30 Nm + torque a further 90° (1/4 turn)

- replace after each removal

8 - Brake carrier with brake shoe

- repairing ⇒ Chapter 46-2

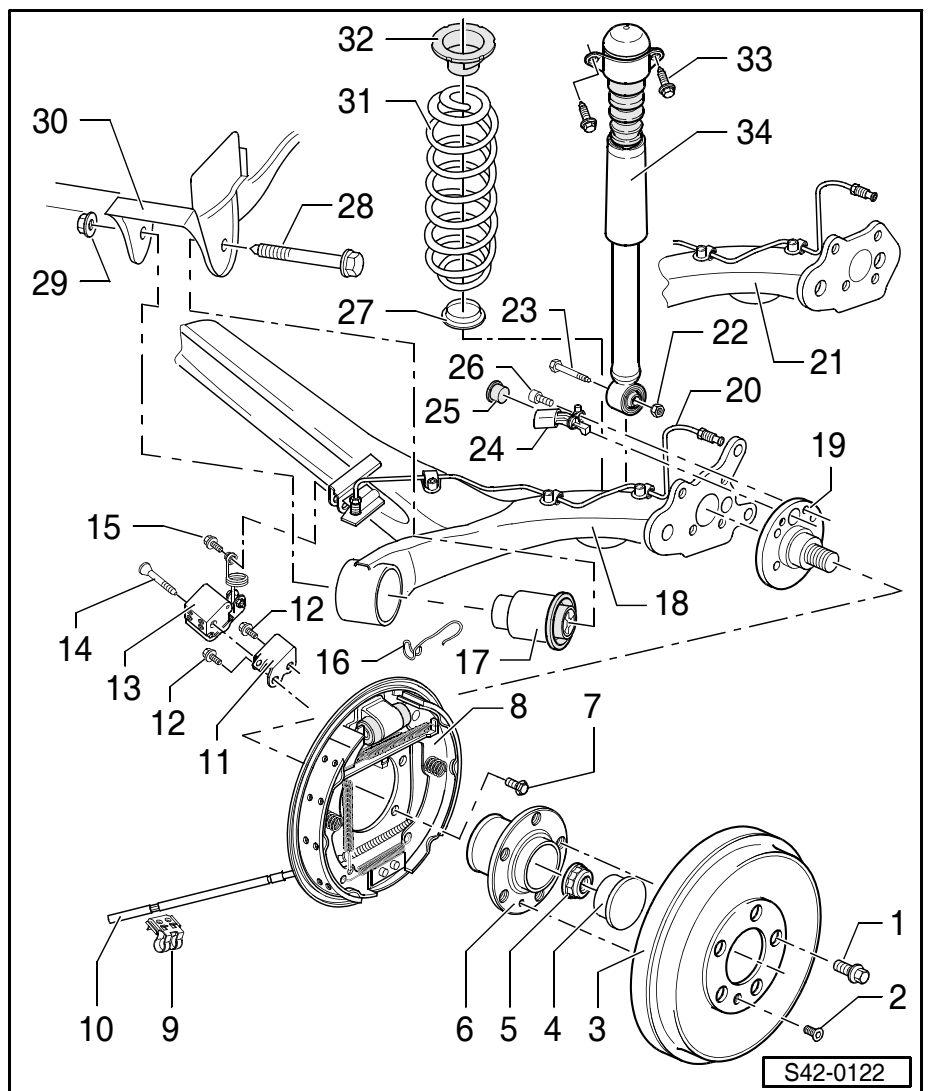
9 - Holder for hand-brake cable

- replace after each removal

- Fitting location ⇒ Chapter 46-3

10 - Hand-brake cable

- removing and installing ⇒ Chapter 46-3



11 - Bracket

- for brake-power regulator
- attached to the vehicle body

12 - Screw, 20 Nm**13 - Brake-power regulator**

- load dependent
- for vehicles without ABS
- inspecting and setting ⇒ Chapter 47-3.

14 - Screw, 16 Nm**15 - Screw, 16 Nm****16 - Holder for hand-brake cable****17 - Bonded rubber bush**

- removing and installing ⇒ Chapter 42-2

18 - Axle body

- Allocation ⇒ Spare parts catalogue
- The locating face and the threaded holes for axle studs must be free from enamel and dirt
- removing and installing ⇒ 42-1 page 3

19 - Axle stud

- Straightening work is not allowed!
- Re-cutting the thread is not allowed!
- removing and installing ⇒ Chapter 42-5

20 - Brake line

- Tightening torque of the pipe screws: 14 Nm

21 - Axle body

- Allocation ⇒ Spare parts catalogue
- The locating face and the threaded holes for axle studs must be free from enamel and dirt

22 - Self-locking nut

- replace after each removal

23 - Screw, 40 Nm + torque a further 90° (1/4 turn)

- replace after each removal
- insert from the inside of the vehicle
- For tightening fully, place vehicle onto its wheels and ensure it is at unladen weight ⇒ Chapter 44-2, then place a weight of 90 kg in the luggage compartment, immediately behind the rear seat.
This operation can be skipped if the shock absorber and rear suspension are preassembled ⇒ Chapter 42-2.

24 - Speed sensor ABS

- Allocation ⇒ Spare parts catalogue

25 - Plug

- for vehicles without ABS
- to plug the hole in the axle stud

26 - Allan screw, 8 Nm

- for speed sensor ABS

27 - Bottom spring base

- inspect for damage (visual inspection)

28 - Screw, 45 Nm + torque a further 90° (1/4 turn)

- replace after each removal
- insert from the outside of the vehicle
- For tightening fully, place vehicle onto its wheels and ensure it is at unladen weight ⇒ Chapter 44-2, then place a weight of 90 kg in the luggage compartment, immediately behind the rear seat.

29 - Self-locking nut

- replace after each removal

30 - Mount for rear axle

- attached to the vehicle body

31 - Helical spring

- removing and installing ⇒ Chapter 42-2
- check for paint damage, if necessary eliminate paint damage
- check colour coding
- Allocation ⇒ Spare parts catalogue
- replace axle-wise
- per rear axle only use helical springs of the same make

32 - Top spring base

- installing ⇒ Chapter 42-2

33 - Screw, 30 Nm + torque a further 90° (1/4 turn)

- replace after each removal

34 - Shock absorber

- removing and installing ⇒ Chapter 42-2
- inspecting ⇒ Chapter 40-2
- disposal ⇒ Chapter 40-2
- can be replaced individually
- Allocation ⇒ Spare parts catalogue
- per rear axle only use shock absorbers of the same make

Fitting location of the shock absorber on the rear axle

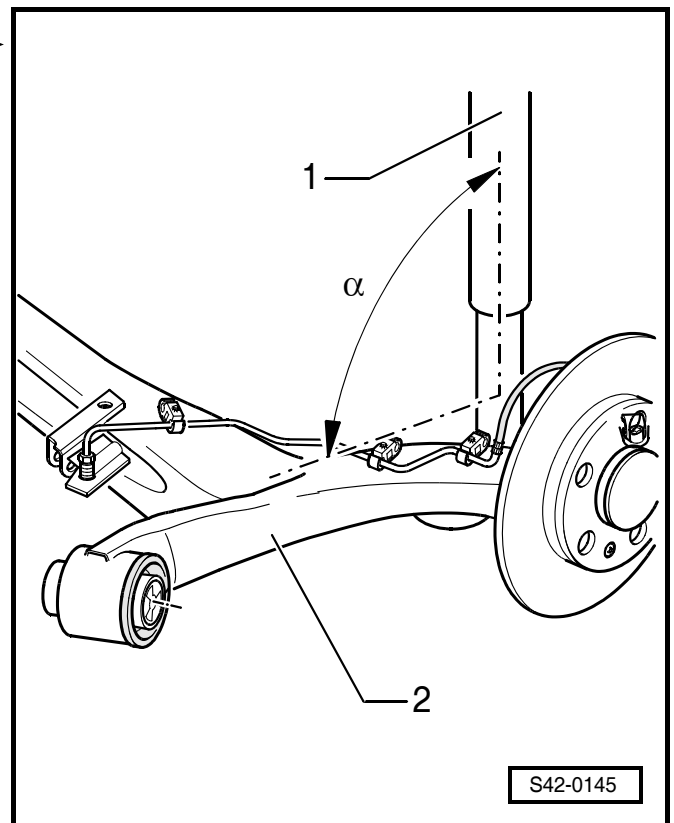
- ◆ If shock absorber -1- is preassembled to the rear axles -2-, pay attention to the installed angle $\alpha = 97^\circ$.
- ◆ Tighten up the screws fully to the specified tightening torque.
- ◆ It is not necessary to initially tighten the bolt and to place a weight of 90 kg in the vehicle.

Removing and installing rear suspension**Special tools, test and measuring equipment and auxiliary items required**

- ◆ Torque wrench
- ◆ Brake pedal arrester, e.g. -V.A.G 1238 B- or brake pedal load-V.A.G 1869/2-
- ◆ Gearbox jack with adapter, e.g. -V.A.G 1383 A- with -V.A.G 1359/2-
- ◆ Spring tensioning device, e. g. -V.A.G 1752/1-
- ◆ Spring holder with protective lining, e. g. -V.A.G 1752/3-
- ◆ Securing strap, e. g. -T10038-
- ◆ Brake filling and bleeding device, e. g. -ROMESS S15-
- ◆ Wooden block 490 x 270 x 50 mm for attachment -V.A.G 1359/2-
- ◆ Assembly paste -G052 150 A2-

Removing

- Remove wheels.



- Removing the centre console ⇒ Body Work; Rep. Gr. 68.
- Actuate the brake pedal and insert the brake pedal depressor.

This prevents the brake line and the ABS hydraulic unit from running empty of brake fluid.

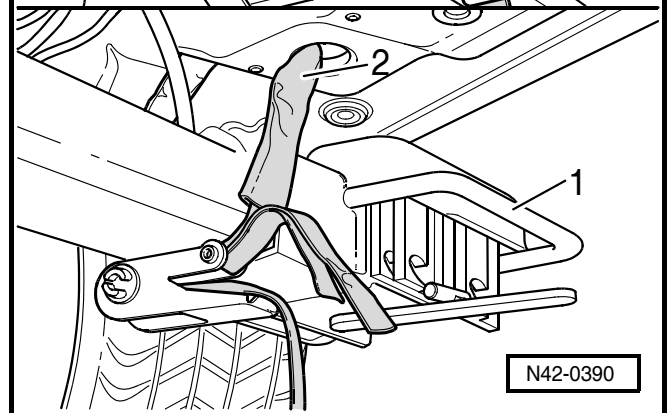
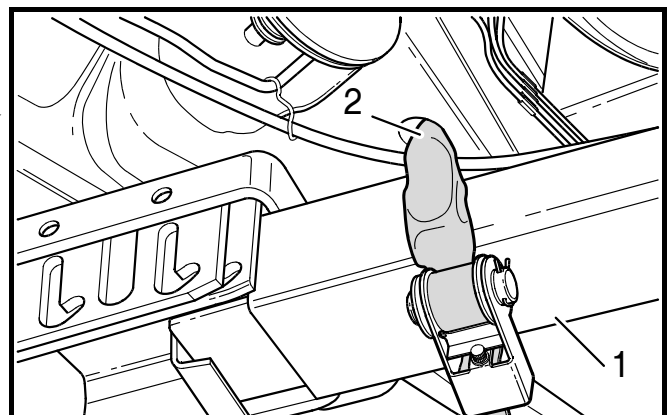
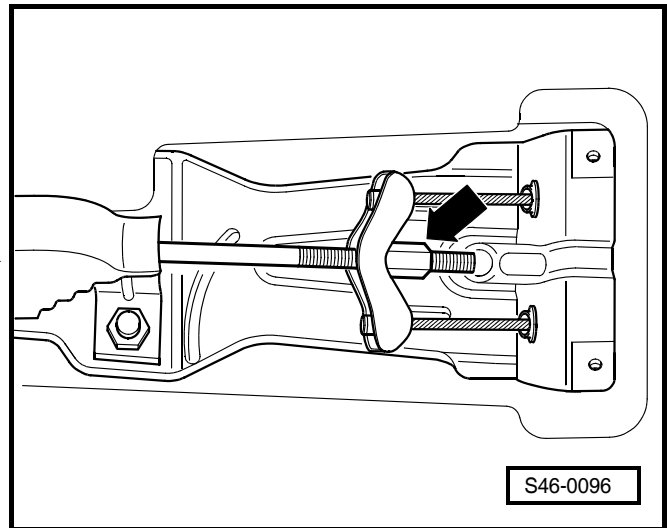
- Release adjusting nut -arrow- and unhook hand-brake cable from compensating clamp. ►
- Pull hand-brake cables out of guide tubes.

⚠ Caution!

- ◆ **Before removing the rear suspension, the vehicle must be lashed securely on both sides at the supporting arms of the lift platform.**
- ◆ **If the vehicle is not lashed, there is a risk of the vehicle toppling off the lift platform.**

- Remove the plugs from the frame side rail and the pull in the securing strap ►

- 1 - Supporting arm of lift platform
- 2 - Securing strap, e. g. -T10038-



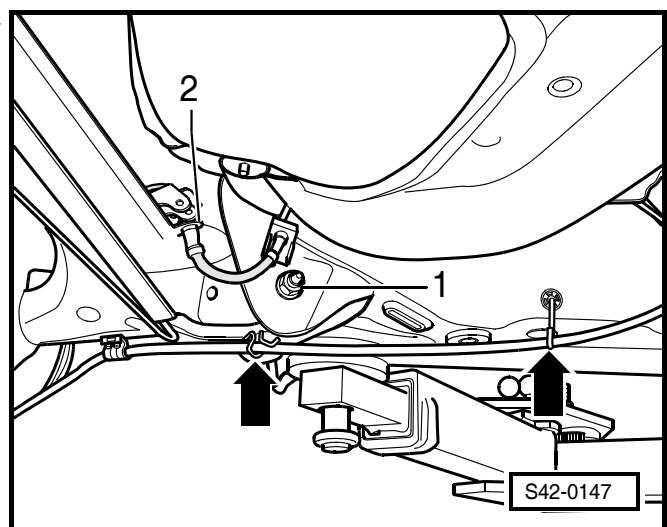
- Lash the vehicle on both sides to the supporting arms of the lift platform.
- Pull out the plug connector from the oil pressure switch.
- Unclip cable for wheel speed sensor from the fixture.
- Unhook handbrake cable from the holders -arrows-. ►
- Detach clip -2- from brake hose fixture.
- Separate brake line.

i Note

Seal brake lines with plugs.

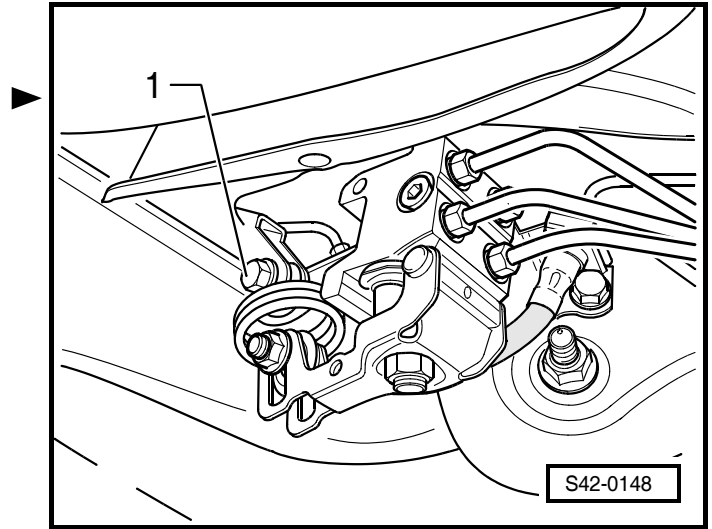
Only on vehicles equipped with Xenon headlights

- Disconnect the tension rod for the sender at the rear of the assembly carrier ⇒ Electrical System; Rep. Gr. 94.



Only on vehicles fitted with load-sensitive brake pressure regulator (without ABS)

- Screw out bolt -1-.



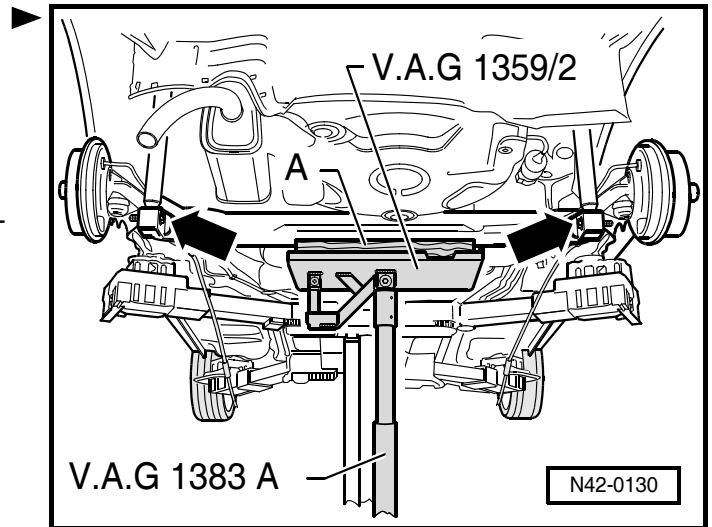
Continued for all vehicles

- Remove coil spring ⇒ Chapter 42-2.
- Slacken the front attachment of the wheelhouse liner at the rear ⇒ Body Work; Rep. Gr. 66.
- Insert wooden block -A- into attachment, e. g. - V.A.G 1359/2-.
- Support rear axle with gearbox jack and attachment.



Note

A second person is required for the further removal operations.

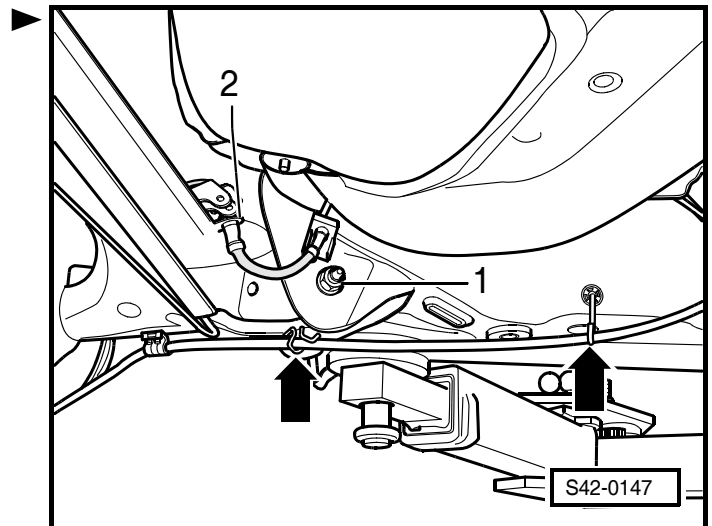


- Unbolt rear suspension from shock absorbers -arrows-.
- Secure rear suspension at attachment, e. g. with strap of attachment V.A.G 1359/2.
- Screw out the bolts -1- of the bearing bracket of the rear axle and lower the rear axle.

Installing

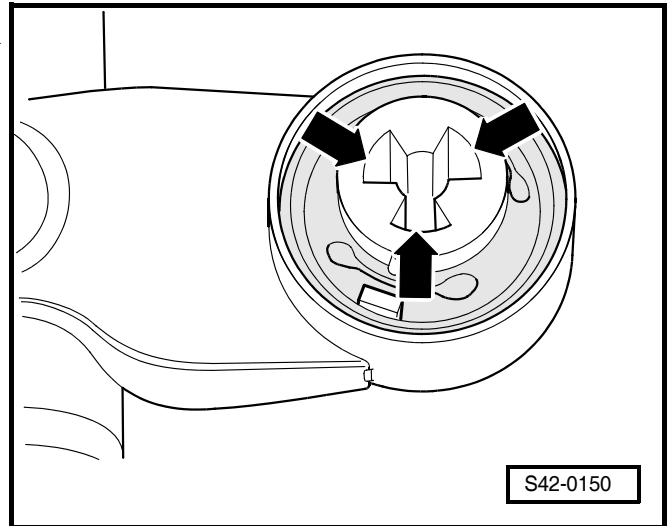
Installation is carried out in the reverse order. Pay attention to the following:

- Before inserting the rear suspension, grease the kidney-shaped cavities of the bonded rubber bushes with assembly paste - G052 150 A2 -.



i Note

- ◆ The bolts of the bearing bracket of the rear suspension must not be inserted into the profiles of the inner core -arrows- of the bonded rubber bush. If this is done, the rear suspension will be installed skewed and the bush will be damaged. In this case, the bush must be replaced.
- ◆ To provide a clearer illustration, the bonded rubber bush is shown with the rear suspension removed.
- ◆ The axle beam should be moved into the horizontal position when tightening the bolts and nuts of the bearing bracket of the rear suspension and the shock absorber. Place the vehicle onto its wheels for this step, ensure vehicle is at unladen weight ⇒ Chapter 44-2 and place a weight of 90 kg in the luggage compartment, immediately behind the rear seat.



- Install shock absorber ⇒ Chapter 42-2.
- Install new nuts and bolts on the front axle mounting but do not tighten up completely.
- Install coil spring ⇒ Chapter 42-2.
- Install a new clamp for attaching the brake line.
- Adjust handbrake ⇒ Chapter 42-2.
- Bleed brake system ⇒ Chapter 47-4.
- If fitted, inspect the load-sensitive brake pressure regulator and set if necessary ⇒ Chapter 47-3.
- If fitted, adjust the upper position of the tension rod in such a way before tightening up so that the sender lever points towards the rear when whipping the rear axle and does not turn upwards.
- Tighten up the screw of the bearing bracket of the rear axle fully to the specified tightening torque. Place vehicle onto its wheels and ensure it is at its unladen weight ⇒ Chapter 44-2. Then place a 90 Kg weight in the luggage compartment immediately behind the rear seat.
- Carry out check of chassis alignment ⇒ Chapter 44-2

Tightening torques:

Brake line to brake hose	14 Nm
Shock absorber to rear suspension	40 Nm +90°
◆ Use new screws and nuts!	
Rear suspension to bearing bracket	45 Nm +90°
◆ Use new screws and nuts!	
Brake pressure regulator to rear suspension	16 Nm
The sender at the rear on the rear axle	16 Nm
Wheel bolts	120 Nm

42-2 Servicing the rear axle with drum brakes

Removing and installing coil spring

Special tools, test and measuring equipment and auxiliary items required

- ◆ Spring tensioning device, e. g. -V.A.G 1752/1-
- ◆ Spring holder with protective lining, e. g. -V.A.G 1752/3-

Removing



Note

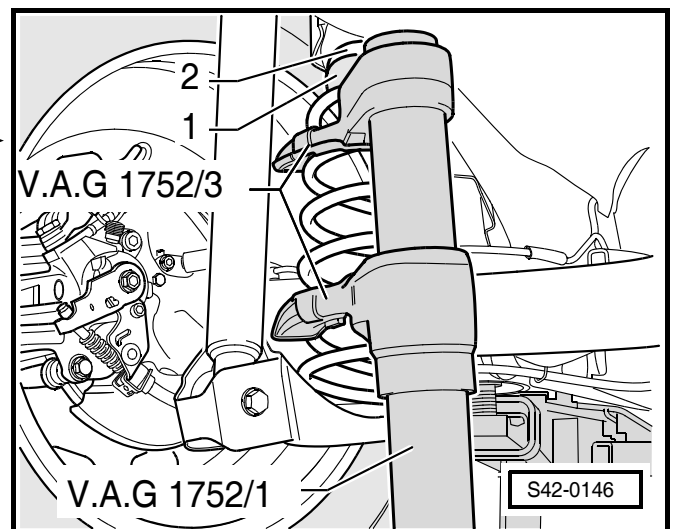
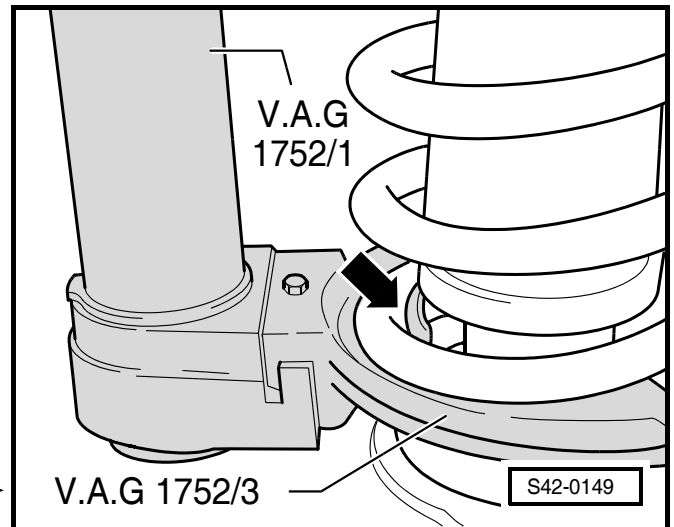
The rear silencer must be taken off in order to remove the left coil spring.

- Removing the rear silencer ⇒ Engine - Mechanics; Rep. Gr. 26.



Note

- ◆ Ensure that the spring holders are positioned as close as possible to the spring coils -arrow-.
 - ◆ During the tensioning operation, ensure that the spring holder is correctly located at the spring coils.
 - ◆ Do not use impact screw drivers.
 - Insert spring tensioning device.
 - Tension coil spring sufficiently until it can be removed.
 - Remove coil spring.
- 1 - top base
2 - Mount for top base



Installing

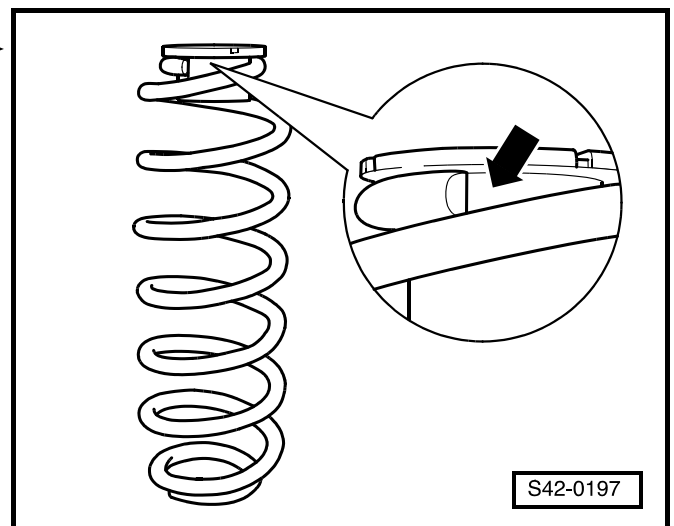
- Check to ensure that the zinc base (bottom base) is not damaged.

Replace if necessary.

- Install the helical spring along with the top base.

The beginning of the spring -arrow- must be positioned at the stop at the top of the base.

- Release the tension of the coil spring and remove the spring tensioner (do not damage surface protection for the coil spring).



Removing and installing shock absorber

Special tools, test and measuring equipment and auxiliary items required

- ◆ Torque wrench
- ◆ Gearbox jack with adapter, e.g. - V.A.G 1383 A- with -V.A.G 1359/2-

Removing

- Remove wheel.
- Place gearbox jack with attachment below and support rear suspension at shock absorber mounting.

Only on vehicles equipped with an Xenon headlights

- Disconnect the tension rod for the sender at the rear of the assembly carrier ⇒ Electrical System; Rep. Gr. 94.

Continued for all vehicles

- Remove bolts -1- and -2-.
- Take out shock absorber.

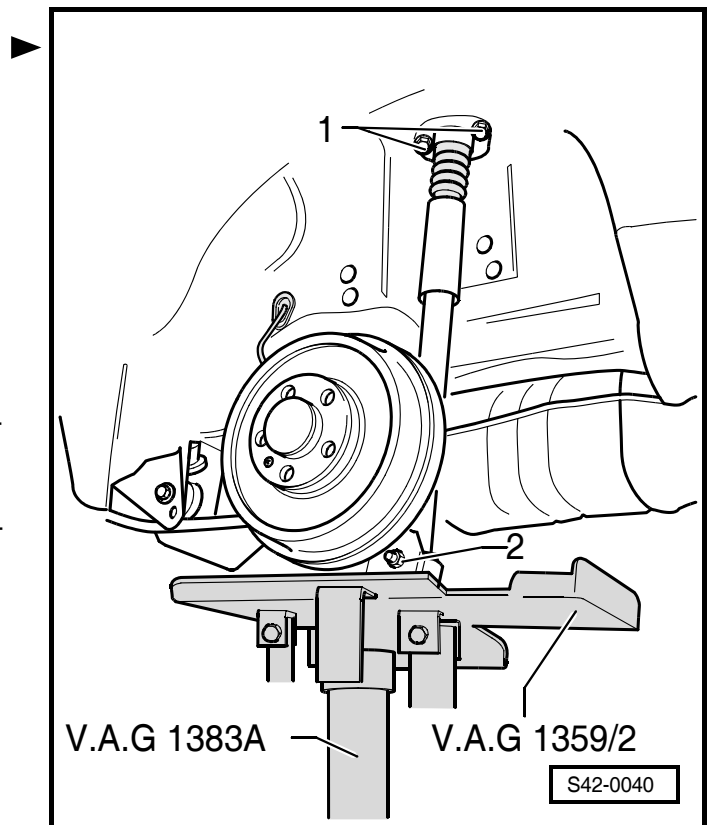
Installing

Installation is carried out in the reverse order. Pay attention to the following:

- Install a bolt on the shock absorber for the rear axle and tighten by hand.
- If fitted, adjust the upper position of the tension rod in such a way before tightening up so that the sender lever points towards the rear when whipping the rear axle and does not turn upwards.
- Place vehicle onto its wheels and ensure it is at its unladen weight ⇒ Chapter 44-2.
- Then place a 90 kg weight in the luggage compartment immediately behind the rear seat bench.
- Tighten up the screws fully to the specified tightening torque.

Tightening torques:

Shock absorber to body	30 Nm + 90°
◆ Use new screws!	
Shock absorber to rear suspension	40 Nm + 90°
◆ Use new screws and nuts!	
Wheel bolts	120 Nm



Disassembling and assembling shock absorber



Note

The shock absorbers must not be disassembled and repaired.

1 - Shock absorber

- can be replaced individually
- removing and installing
⇒ 42-2 page 2
- assignment ⇒ Spare part catalogue
- disposal ⇒ Chapter 40-2
- inspect ⇒ Chapter 40-2

2 - Protective cap

3 - Protective tube

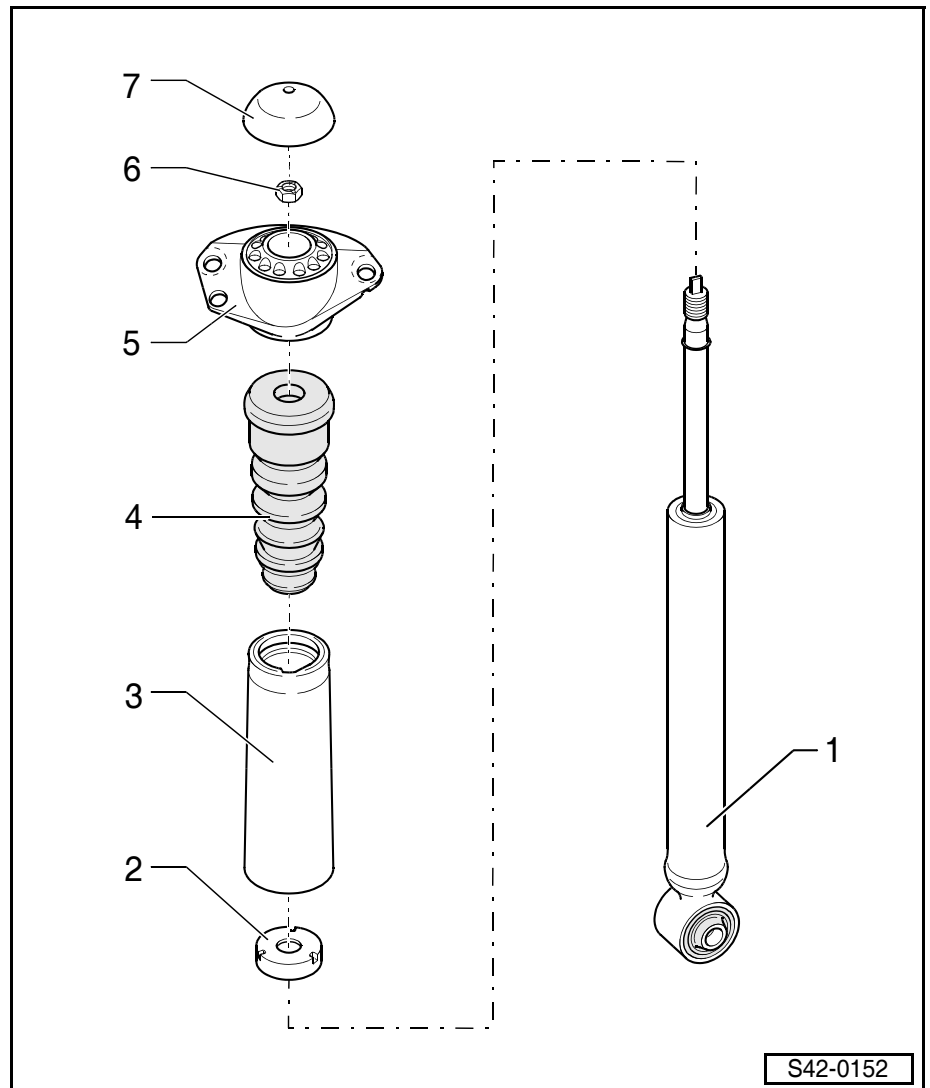
4 - Stop buffer

5 - Shock absorber bushing

6 - Self-locking nut, 25 Nm

- replace after each removal
- counterhold the piston rod of the shock absorber at the tip in order to slacken and tighten the nut

7 - Cover



Inspecting the shock absorber

⇒ Chapter 40-2

Disposing of the shock absorber

⇒ Chapter 40-2

removing and installing rubber-metal bearing

Special tools, test and measuring equipment and auxiliary items required

- ◆ Universal tool -MP 3-419-
- ◆ Axial bearing -MP 5-402-

- ◆ Assembly device, e. g. -MP 5-400-
- ◆ Assembly device, e. g. -MP 5-401-
- ◆ Assembly device, e. g. -MP 6-430-
- ◆ Torque wrench
- ◆ Gearbox jack with adapter, e.g. - V.A.G 1383 A- with -V.A.G 1359/2-
- ◆ Wooden block 490 x 270 x 50 mm for attachment -V.A.G 1359/2-
- ◆ Securing strap, e. g. -T10038-

Removing



Note

It is only possible to replace the bonded rubber bush when the rear suspension is lowered.

- Remove wheels.



Caution!

- ◆ **Before removing the rear suspension, the vehicle must be lashed securely on both sides at the supporting arms of the lift platform.**
- ◆ **If the vehicle is not lashed, there is a risk of the vehicle toppling off the lift platform.**

- Remove the plugs from the frame side rail and the pull in the securing strap

- 1 - Supporting arm of lift platform
- 2 - Securing strap, e. g. - T10038-

- Lash the vehicle on both sides to the supporting arms of the lift platform.

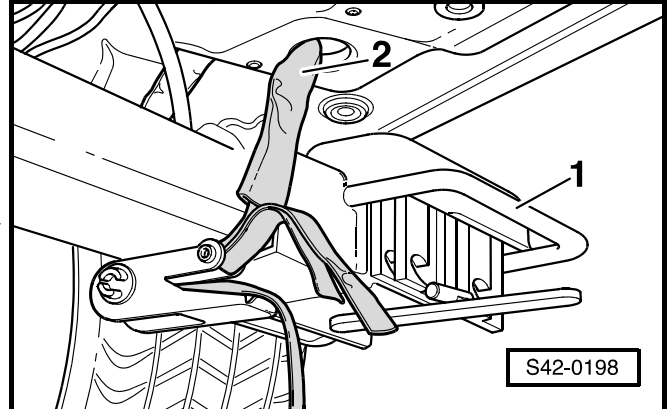
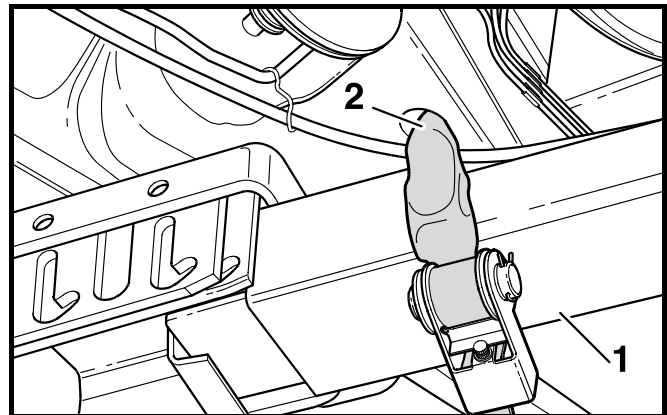
- Unhook handbrake cable from the holders -arrows-.

- Detach clip -2- from brake hose fixture.

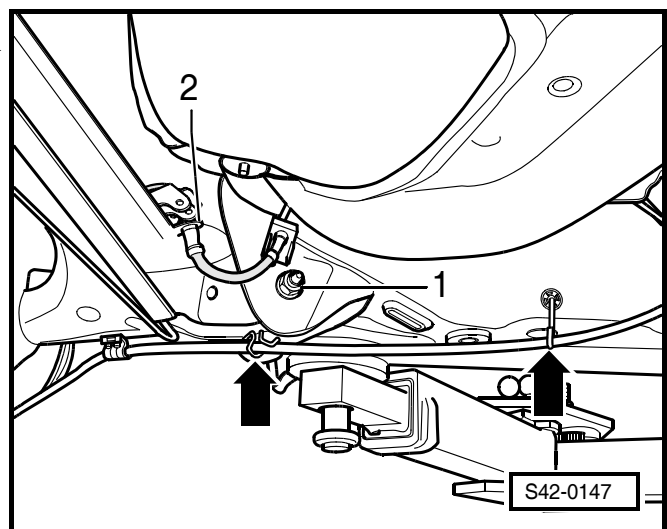
- Release brake line from fixture, on no account separate.

Only on vehicles equipped with an Xenon headlights

- Disconnect the tension rod for the sender at the rear of the assembly carrier ⇒ Electrical System; Rep. Gr. 94.



S42-0198



S42-0147

Only on vehicles fitted with load-sensitive brake pressure regulator (without ABS)

- Release screw -1-.
- Slacken the front attachment of the wheelhouse liner at the rear ⇒ Body Work; Rep. Gr. 66.
- Remove coil spring ⇒ 42-2 page 1.

Continued for all vehicles

- Insert wooden block into attachment, e. g. -V.A.G 1359/2-.
- Support rear axle with gearbox jack and attachment.



Note

A second person is required for the further removal operations.

- Secure the rear axle with the strap of the attachment.
- Screw out bolts -1- on the bearing bracket of the rear axle.
- Swivel rear suspension on both sides down and out of the bearing brackets.



Note

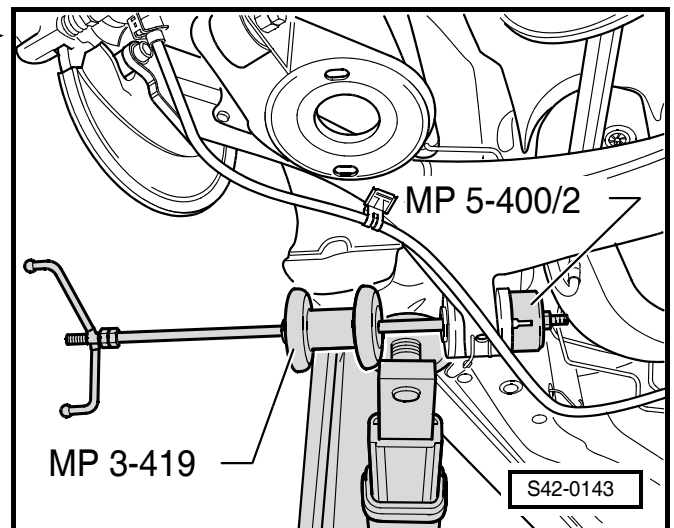
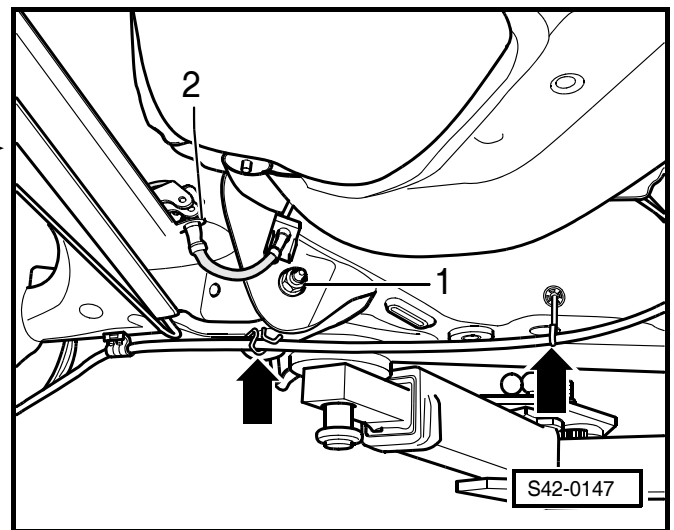
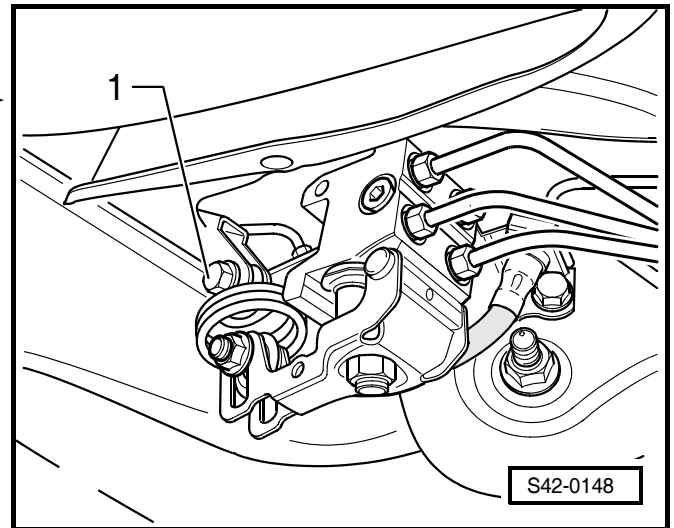
- ◆ When lowering the rear axle, ensure that the brake lines and handbrake cables are not tensioned.
- ◆ Lower rear suspension only sufficiently to gain clear access to the rubber-metal bearing.

- Lower rear suspension.
- Insert special tools as shown and pull out rubber-metal bearing.



Note

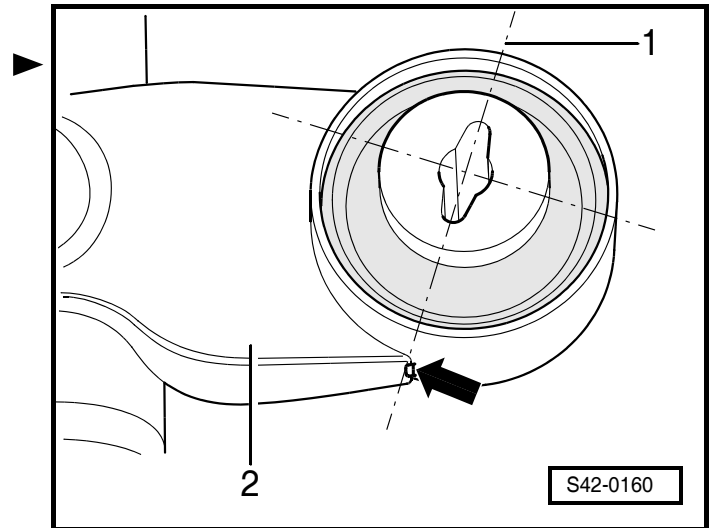
A second mechanic must counterhold at the rear axle when pulling out the rubber-metal bearing.



Installing

Fabia RS

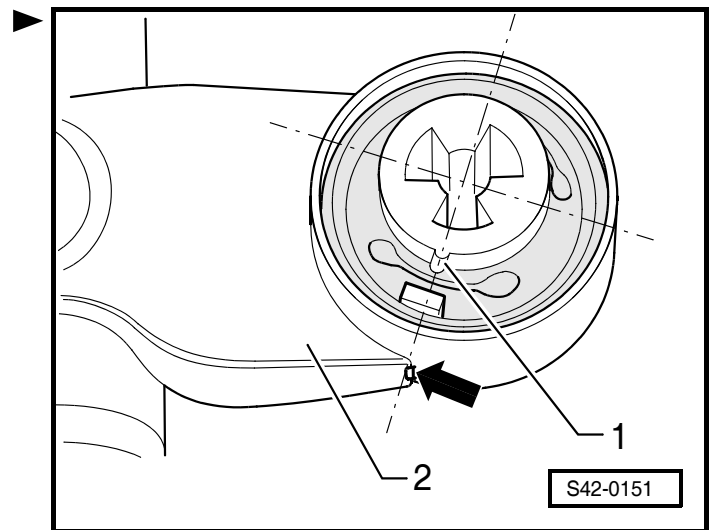
The axle -1- must be aligned with the edge -arrow- of the trailing arm -2-.



Other vehicles (except Fabia RS)

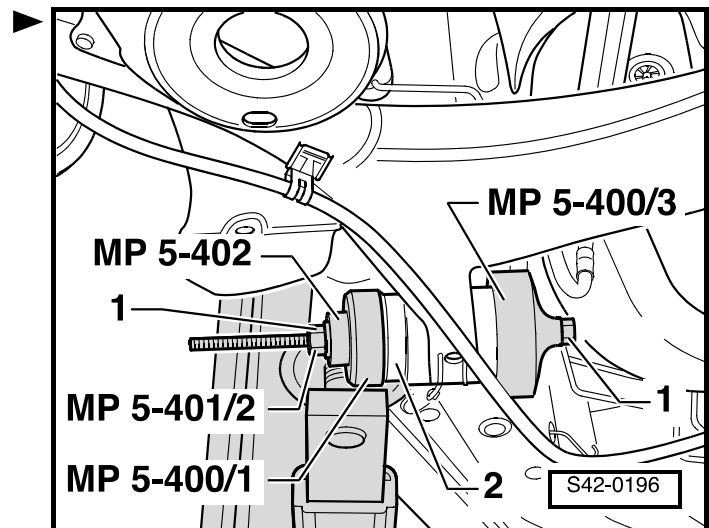
The rubber-metal bearing has a marking -1- on the inside. This marking must be aligned with the edge -arrow- of the trailing arm -2-.

- Mark the position of the marking -1- on the rubber-metal bearing.



Fabia RS

- Insert special tools together with rubber-metal bearing as shown.



Other vehicles (except Fabia RS)

- Insert special tools together with rubber-metal bearing as shown.

For all vehicles

- Ensure that the marking or the axle is aligned with the edge of the trailing arm.
- Pull the rubber-metal bearing -2- onto the spindle by turning.
- Verify the installed position of the mounting once the installation is complete.

If the marking or the axle is not aligned with the edge of the trailing arm, it is then necessary to repeat removal and installation.

Further installation occurs in reverse order. Pay attention to the following:

- Before inserting the rear suspension, grease the kidney-shaped cavities of the rubber-metal bearing with assembly paste -G 052 150 A2-.



Note

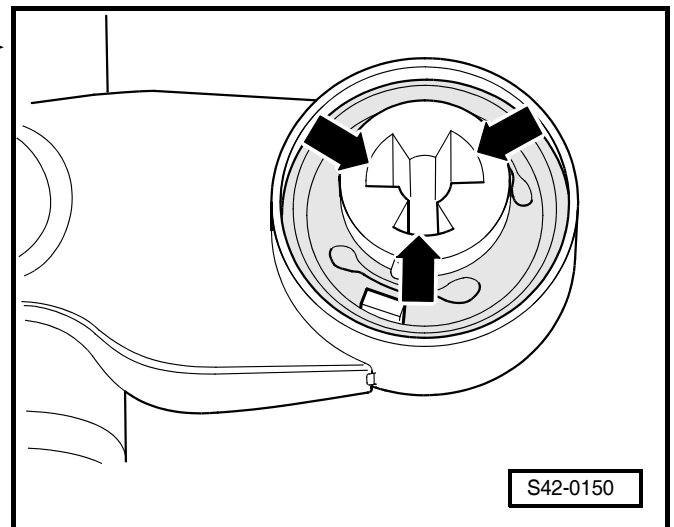
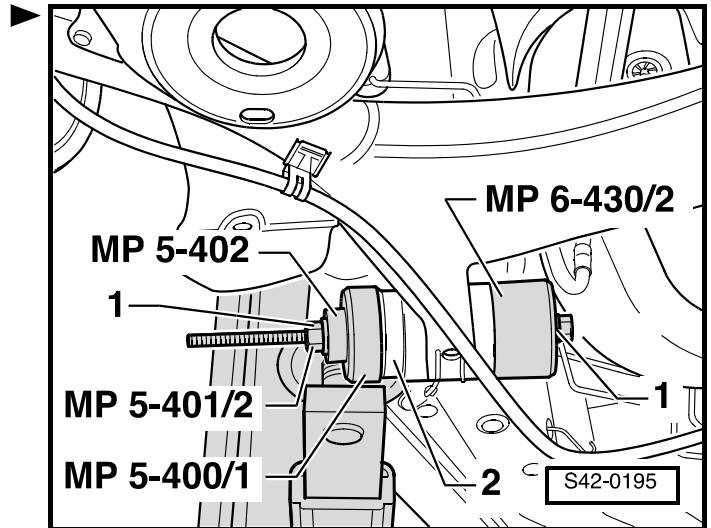
- ◆ *The bolts of the bearing bracket of the rear suspension must not be inserted into the profiles of the inner core -arrows- of the rubber-metal bearing. If this is done, the rear suspension will be installed skewed and the bush will be damaged. In this case, the rubber-metal bearing must be replaced.*
- ◆ *To provide a clearer illustration, the rubber-metal bearing is shown with the rear suspension removed.*
- Install new nuts and bolts on bearing bracket of the rear axle and tighten by hand.



Note

The axle beam should be moved into the horizontal position when tightening the bolts and nuts. Place the vehicle onto its wheels for this step, ensure vehicle is at unladen weight ⇒ Chapter 44-2 and place a weight of 90 kg in the luggage compartment, immediately behind the rear seat bench.

- Install coil spring ⇒ 42-2 page 1.
- If fitted, adjust the upper position of the tension rod in such away before tightening up so that the sender lever points towards the rear when whipping the rear axle and does not turn upwards.
- Install a new clamp for attaching the brake line.
- Tighten up the screw of the bearing bracket of the rear axle fully to the specified tightening torque. Place vehicle onto its wheels and ensure it is at its unladen weight ⇒ Chapter 44-2. Then place a 90 kg weight in the luggage compartment immediately behind the rear seat bench.



Tightening torques:

Rear suspension to bearing bracket ◆ Use new screws and nuts!	45 Nm + 90°
Brake pressure regulator to rear suspension	16 Nm
The sender at the rear on the rear axle	16 Nm
Wheel bolts	120 Nm

42-3 Rear suspension with disc brake

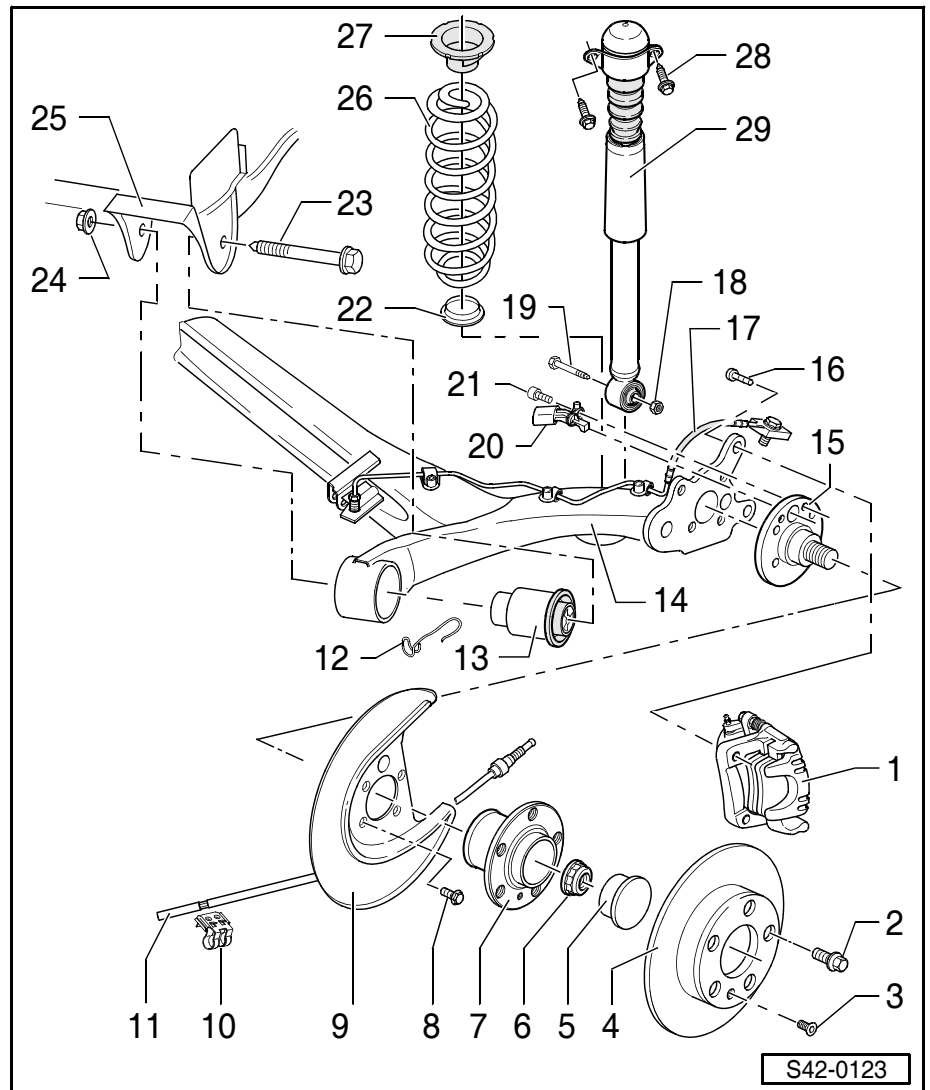
Summary of components of rear suspension



Note

- ◆ *Welding and straightening on axle beam and axle stubs not allowed.*
- ◆ *Always replace the self-locking nuts and bolts.*
- ◆ *Always replace corroded self-locking nuts and bolts.*
- ◆ *Always tighten pipe connections of brake lines to a torque of 14 Nm.*

- 1 - Brake caliper**
 - repairing ⇒ Chap. 47-1
- 2 - Wheel bolt, 120 Nm**
 - Assignment ⇒ Spare part catalogue
- 3 - Cross-head screw, 4 Nm**
- 4 - Brake disc**
- 5 - Cap**
 - replace each time removed
 - pressing off and inserting ⇒ Chap. 42-5
- 6 - Twelve-point nut, self-locking, 70 Nm + torque a further 30° (1/12 turn)**
 - replace each time removed
- 7 - Wheel hub with wheel bearing**
 - for vehicles with ABS the sensor ring is built into the wheel hub
 - Wheel hub and wheel bearing form one unit. The unit is maintenance-free. Adjusting and repairs are not possible.
 - The sensor ring for ABS cannot be replaced individually
 - removing and installing ⇒ Chap. 42-5
 - Assignment ⇒ Spare part catalogue
- 8 - Hexagon bolt + washer, 30 Nm + torque a further 90° (1/4 turn)**
 - replace each time removed
- 9 - Cover plate**
- 10 - Fixture for handbrake cable**
 - replace each time removed
 - Fitting location ⇒ Chap. 46-3
- 11 - Handbrake cable**
 - removing and installing ⇒ Chap. 46-3
- 12 - Fixture for handbrake cable**
- 13 - Bonded rubber bush**
 - removing and installing ⇒ Chap. 42-2
- 14 - Axle beam**
 - Assignment ⇒ Spare part catalogue



- The locating face and the threaded holes for axle stubs must be free from enamel and dirt

15 - Axle stub

- Straightening work is not allowed!
- Re-cutting the thread is not allowed!
- removing and installing ⇒ Chap. 42-5

16 - Hexagon bolt, 30 Nm + torque a further +30° (1/12 turn)

17 - Brake line with connection, banjo bolt and seals

- must not be disassembled, must be replaced completely
- Tightening torque of banjo bolt: 35 Nm
- do not unscrew when replacing the brake pad

18 - Self-locking hexagon nut

- replace each time removed

19 - Hexagon bolt, 40 Nm + torque a further 90° (1/4 turn)

- replace each time removed
- insert from the inside of the vehicle
- For tightening fully, place vehicle onto its wheels and ensure it is at unladen weight ⇒ Chap. 44-2, then place a weight of 90 kg in the luggage compartment, immediately behind the rear seat.
This operation can be deleted if shock absorber and rear suspension are preassembled, while maintaining the correct installation angle ⇒ Chap. 42-2.

20 - Speed sensor ABS

- Assignment ⇒ Spare part catalogue

21 - Hexagon socket bolt, 8 Nm

- for speed sensor ABS

22 - Bottom spring base

- inspect for damage (visual inspection)

23 - Hexagon bolt, 45 Nm + torque a further 90° (1/4 turn)

- replace each time removed
- insert from the outside of the vehicle
- For tightening fully, place vehicle onto its wheels and ensure it is at unladen weight ⇒ Chap. 44-2, then place a weight of 90 kg in the luggage compartment, immediately behind the rear seat.

24 - Self-locking hexagon nut

- replace each time removed

25 - Mount for rear suspension

- welded to body

26 - Coil spring

- removing and installing ⇒ Chap. 42-4
- check for paint damage, if necessary eliminate paint damage
- check colour coding
- Assignment ⇒ Spare part catalogue
- always replace on both sides of axle
- use only coil springs of the same make on an axle

27 - Top spring base

- installing ⇒ Chap. 42-4

28 - Hexagon bolt, 30 Nm + torque a further 90° (1/4 turn)

- replace each time removed

29 - Shock absorber

- removing and installing ⇒ Chap. 42-4
- inspecting ⇒ Chap. 40-2
- disposal ⇒ Chap. 40-2
- can be replaced individually
- Assignment ⇒ Spare part catalogue
- use only shock absorbers of the same make on an axle

Fitting location of shock absorber of rear suspension

⇒ Chap. 42-1

Removing and installing rear suspension

⇒ Chap. 42-1

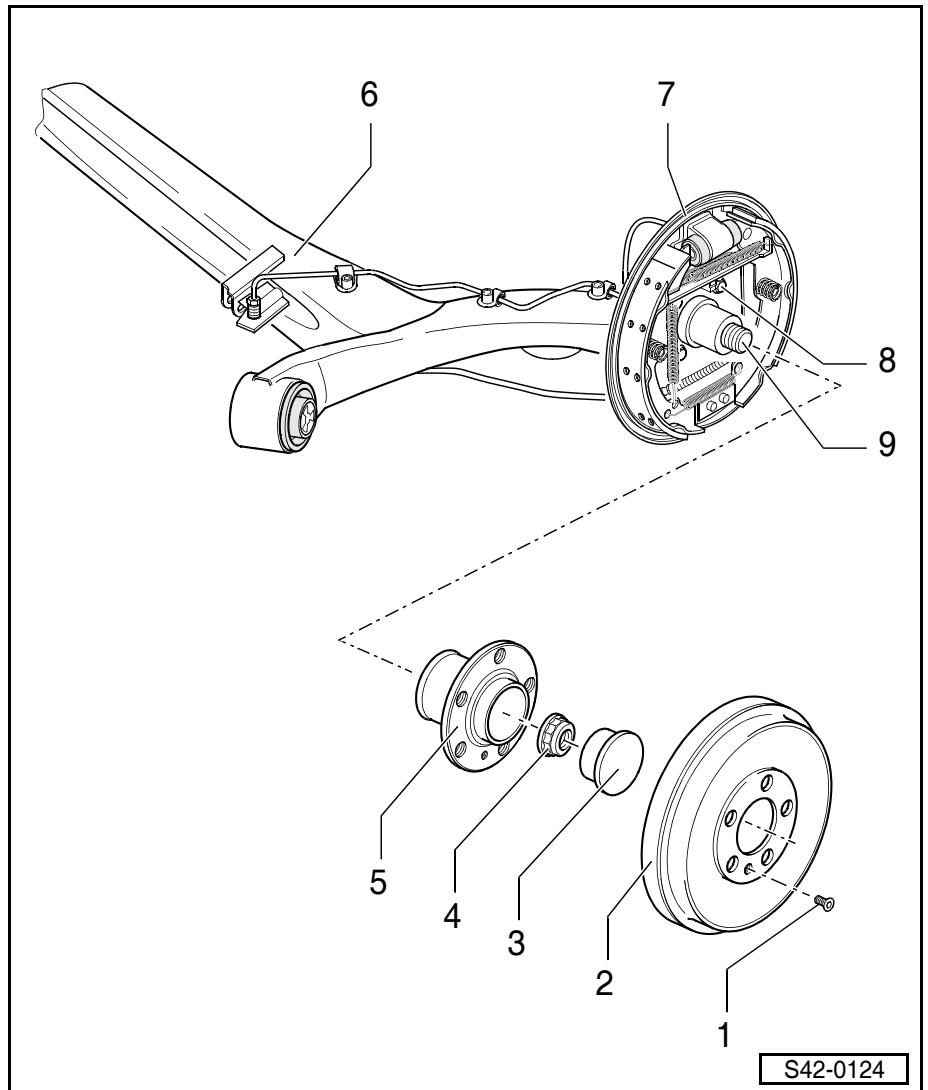
42-4 Servicing rear suspension with disc brake

⇒ Chap. 42-2

42-5 Repairing the wheel bearing

Summary of components of wheel bearing - drum brake

- 1 - Phillips screw, 4 Nm
- 2 - Brake drum
- 3 - Cap
 - replace after each removal
 - extracting and inserting
⇒ 42-5 page 1
- 4 - Self-locking twelve-point nut, 70 Nm and tighten a further 30°
 - replace after each removal
- 5 - Wheel hub with wheel bearing
 - Wheel hub with wheel bearing form one unit. The unit is maintenance-free. Adjusting and repairs are not possible.
 - removing and installing
⇒ 42-5 page 1
 - Assignment ⇒ Spare Part Catalogue
- 6 - Axle body
- 7 - Brake carrier with brake shoe
 - removing and installing
⇒ Chap. 46-2
- 8 - Tighten combination hexagon screw 30 Nm and 90°
 - replace after each removal
- 9 - Axle stud
 - Straightening work is not allowed!
 - Re-cutting the thread is not allowed!
 - removing and installing
⇒ 42-5 page 6



Removing and installing the wheel hub with wheel bearing - drum brake

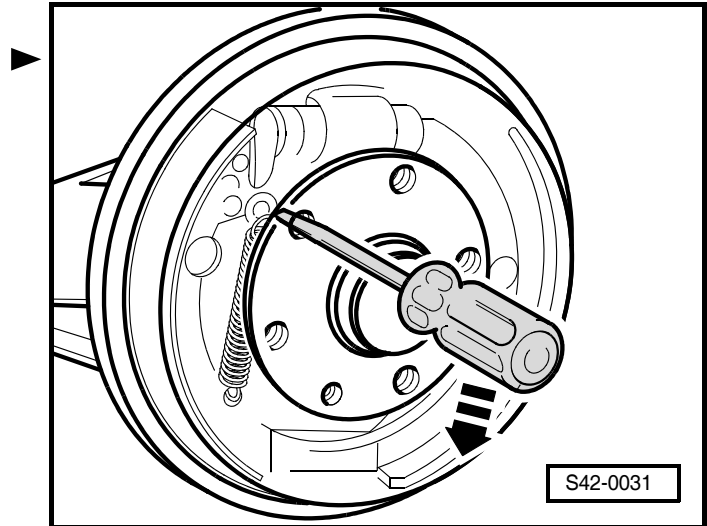
Special tools, test and measuring equipment and auxiliary items required

- ◆ Drive bushing -MP 3-427-
- ◆ Hub cap extractor -MP 5-404-
- ◆ Torque wrench (40...200 Nm), e.g. -V.A.G 1332-
- ◆ Torque wrench (4...20 Nm), e.g. -V.A.G 1410-
- ◆ Torque wrench, e.g. - V.A.G 1756-

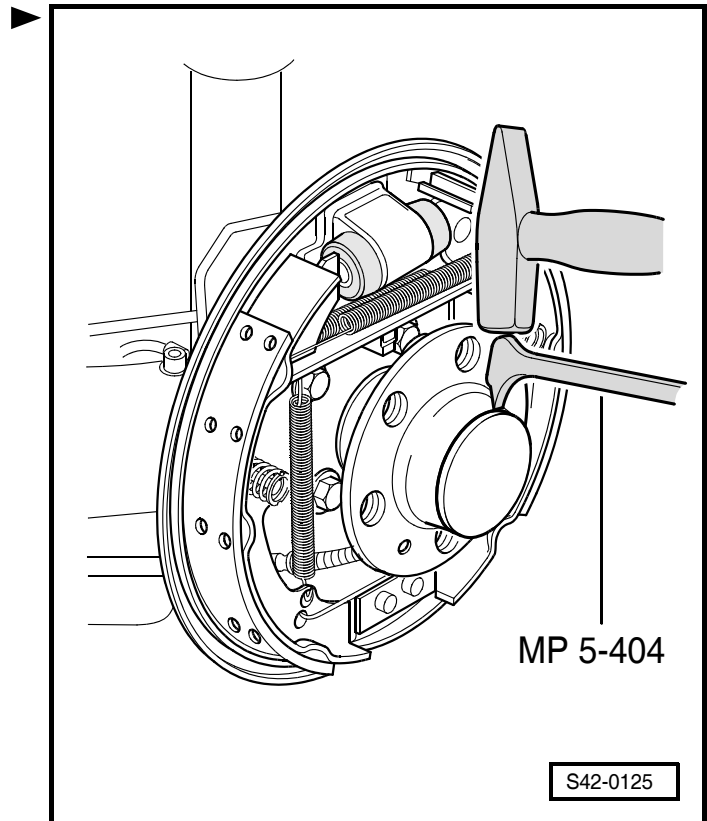
Removing

- Raise vehicle.

- Unscrew rear wheel.
- Resetting brake.
- To this end use a screwdriver to push the wedge up through a hole for the wheel screws in the brake drum.
- Unscrew the Phillips head screws of the drum brake and remove drum brake.



- Release cap from its position by gently tapping the claw of the hub cap extractor.



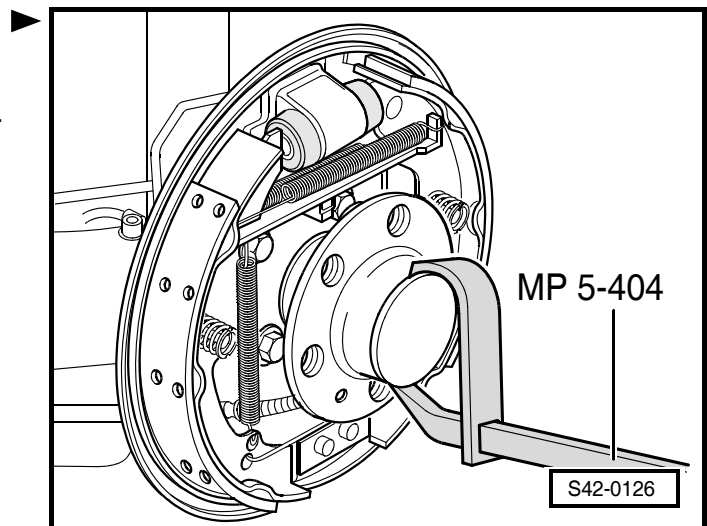
- Press off cap.
- Release twelve-point nut.
- Remove wheel hub with wheel bearing from axle stud.

! Caution!

On vehicles with ABS make sure the sensor ring is not damaged.

Installing

- Carefully slide the wheel hub with wheel bearing onto the axle stud up to the stop.



! Caution!

On vehicles with ABS make sure the sensor ring is not damaged.

i Note

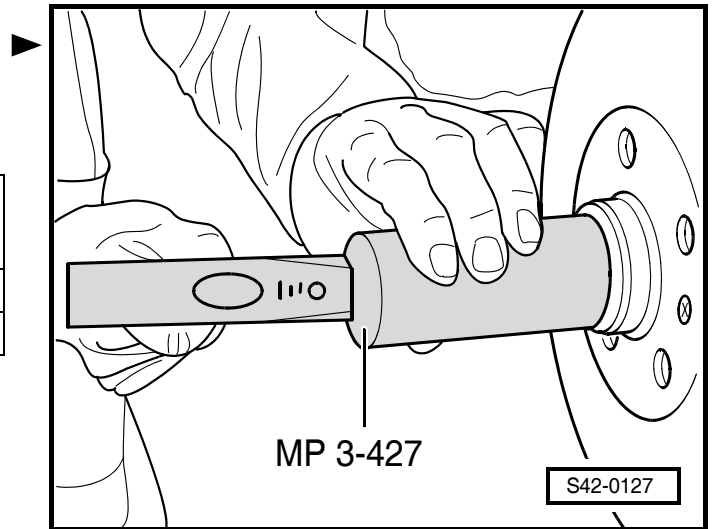
- ◆ Do not tilt the wheel hub with wheel bearing on the axle stud.
- ◆ Use new twelve-point nuts.
- ◆ Replace cap after each removal.
- ◆ Damaged caps allow moisture to penetrate.

Further installation occurs in reverse order.

- Drive in new cap.

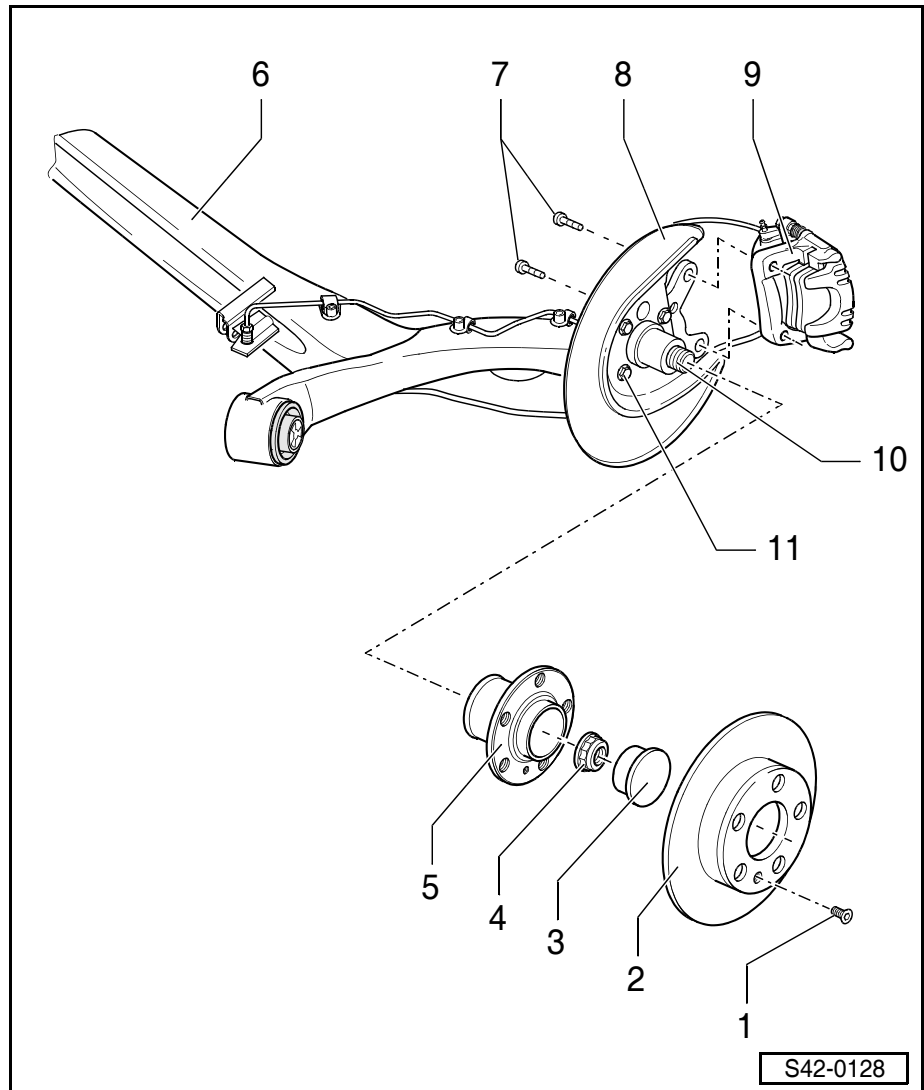
Tightening torques:

Twelve-point nut to axle stud	70 Nm + 30°
◆ Use new nut!	
Drum brake to wheel hub	4 Nm
Wheel bolts	120 Nm



Summary of components of wheel bearing - disc brake

- 1 - Phillips screw, 4 Nm
- 2 - Brake disc
- 3 - Cap
 - replace after each removal
 - extracting and inserting
⇒ 42-5 page 4
- 4 - Self-locking twelve-point nut, 70 Nm and tighten a further 30°
 - replace after each removal
- 5 - Wheel hub with wheel bearing
 - Wheel hub with wheel bearing form one unit. The unit is maintenance-free. Adjusting and repairs are not possible.
 - removing and installing
⇒ 42-5 page 4
 - Assignment ⇒ Spare Part Catalogue
- 6 - Axle body
- 7 - Allan screw, 30 Nm +30°
- 8 - Cover plate
- 9 - Brake carrier with brake caliper
- 10 - Axle stud
 - Straightening work is not allowed!
 - Re-cutting the thread is not allowed!
 - removing and installing
⇒ 42-5 page 6
- 11 - Tighten combination hexagon screw 30 Nm and 90°
 - replace after each removal



Removing and installing the wheel hub with wheel bearing - disc brake

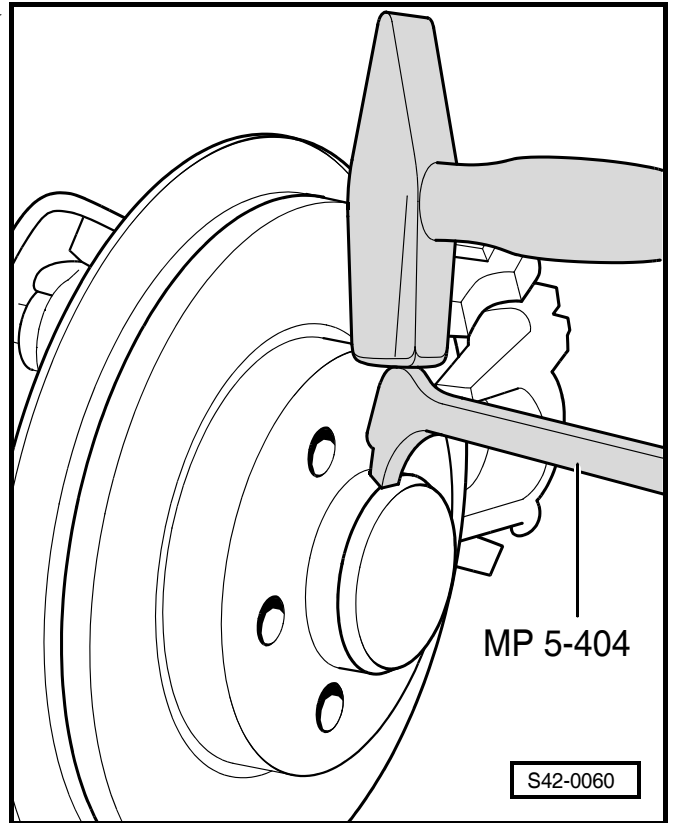
Special tools, test and measuring equipment and auxiliary items required

- ◆ Drive bushing -MP 3-427-
- ◆ Hub cap extractor -MP 5-404-
- ◆ Torque wrench (40...200 Nm), e.g. -V.A.G 1332-
- ◆ Torque wrench (4...20 Nm), e.g. -V.A.G 1410-
- ◆ Torque wrench, e.g. - V.A.G 1756-

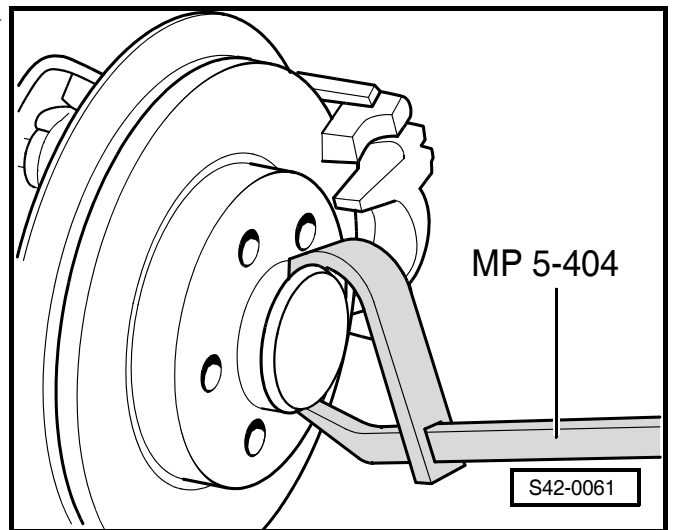
Removing

- Raise vehicle.
- Unscrew rear wheel.

- Release cap from its position by gently tapping the claw of the hub cap extractor. ►



- Press off cap. ►

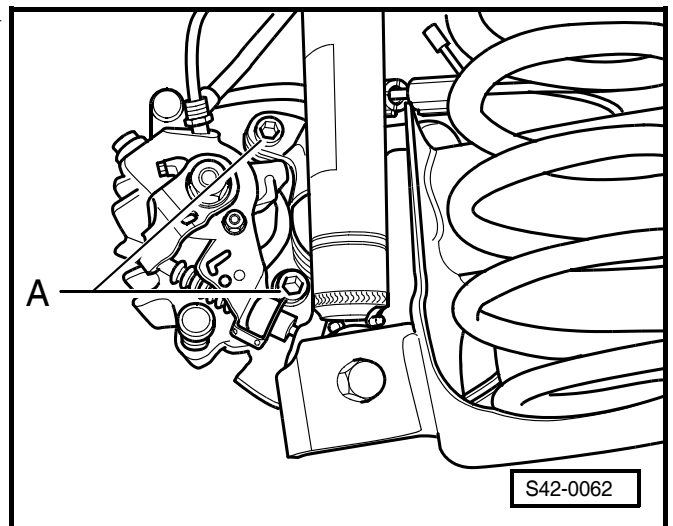


- Unscrew screws -A-, remove brake caliper and tie up with wire or anything similar. ►

i Note

Do not unscrew the brake hose to remove the brake caliper.

- Unscrew the Phillips head screws of the brake disc and remove brake disc.
- Unscrew the twelve-point nut.
- Remove wheel hub with wheel bearing from axle stud.



! Caution!

On vehicles with ABS make sure the sensor ring is not damaged.

Installing

- Carefully slide the wheel hub with wheel bearing onto the axle stud up to the stop.

! Caution!

On vehicles with ABS make sure the sensor ring is not damaged.

i Note

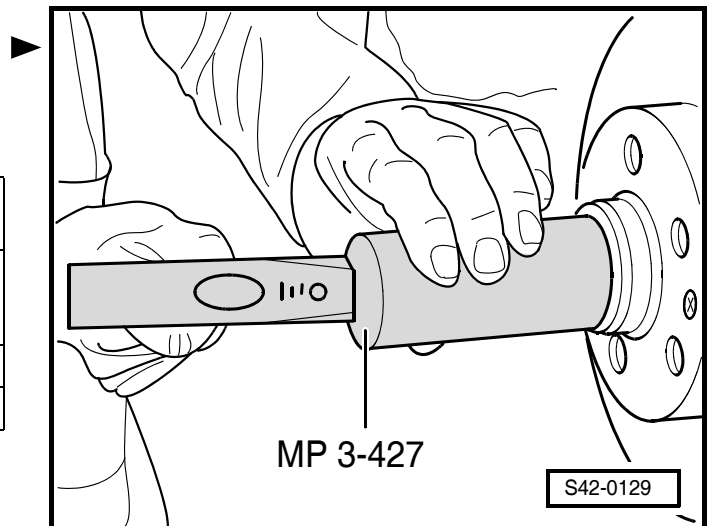
- ◆ Do not tilt the wheel hub with wheel bearing on the axle stud.
- ◆ Use new twelve-point nuts.
- ◆ Replace cap after each removal.
- ◆ Damaged caps allow moisture to penetrate.

Further installation occurs in reverse order.

- Drive in new cap.

Tightening torques:

Brake carrier with brake caliper to axle body	30 Nm +30°
Twelve-point nut to axle stud	70 Nm +30°
◆ Use new nut!	
Brake disc to wheel hub	4 Nm
Wheel bolts	120 Nm



Removing and installing axle studs

Special tools, test and measuring equipment and auxiliary items required

- ◆ Drive bushing -MP 3-427-
- ◆ Hub cap extractor -MP 5-404-
- ◆ Torque wrench (40...200 Nm), e.g. -V.A.G 1332-
- ◆ Torque wrench (4...20 Nm), e.g. -V.A.G 1410-
- ◆ Torque wrench, e.g. - V.A.G 1756-

The following special tools and aids are only required for vehicles with drum brakes.

- ◆ Vehicle system tester -V.A.G 1552- (only for vehicles with ABS/TCS)
- ◆ Diagnostic cable -V.A.G 1551/3-
- ◆ Brake pedal arrester, e.g. -V.A.G 1238 B- or brake pedal load device, e.g. -V.A.G 1238 B-

- ◆ Brake filling and bleeding device. -ROMESS S15-
- ◆ Bleeding bottle (commercially available)
- ◆ Brake fluid ⇒ Chap. 00-3

i Note

- ◆ Straightening work on axle studs is not allowed!
- ◆ Re-cutting the axle stud thread is not allowed!

Removing and installing the axle stud - Drum brake

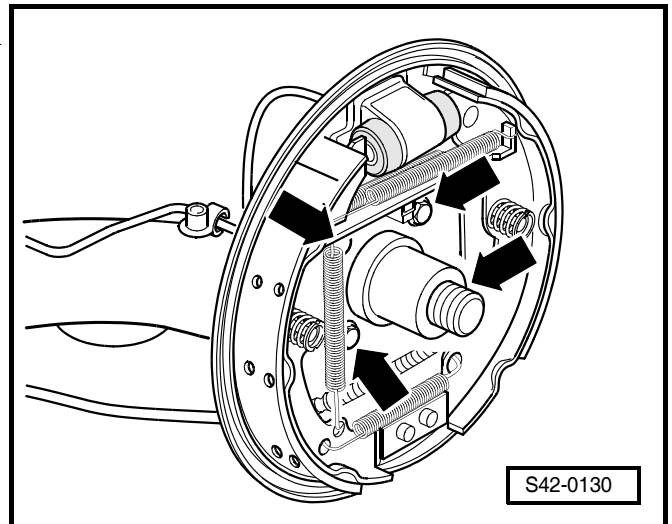
- Removing the wheel hub with wheel bearing ⇒ 42-5 page 1.
- Release hexagon screws -arrows-.
- Removing the brake carrier with brake shoe ⇒ Chap. 46-2.
- Remove the axle stud.

The installation occurs in reverse order.

- Bleeding brake system ⇒ Chap. 47-4.

Tightening torques:

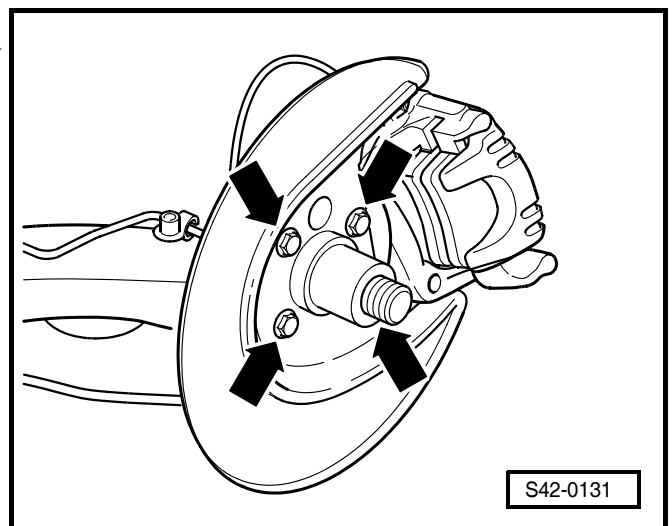
Axle stud to axle body	30 Nm + 90°
◆ Use new screws!	
Twelve-point nut to axle stud	70 Nm + 30°
◆ Use new nut!	
Drum brake to wheel hub	4 Nm
Brake line to wheel brake cylinder	14 Nm
Wheel bolts	120 Nm



Removing and installing the axle stud - Disc brake

- Removing the wheel hub with wheel bearing ⇒ 42-5 page 4.
- Release hexagon screws -arrows-.
- Remove cover plate and axle stud.

The installation occurs in reverse order.



Tightening torques:

Axle stud to axle body ♦ Use new screws!	30 Nm + 90°
Twelve-point nut to axle stud ♦ Use new nut!	70 Nm + 30°
Brake disc to wheel hub	4 Nm
Brake carrier with brake caliper to axle body	30 Nm +30°
Wheel bolts	120 Nm

44 – Wheels, Tyres, Chassis Alignment

44-1 Wheels, Tyres

Wheel/tyre combinations ⇒ Chap. 00-4

Further information can be found in the instructions for use.

General points

For safety reasons never change tyres individually but at least in axle pairs.

Tyres with the greatest tread depth must always be fitted at the rear.

It is recommended to fit tyres of the same make, same type and tread pattern on all wheels.

When replacing the disc wheel or the tyre always replace the rubber valve.



Note

Before installing the wheel, coat the centering of the hub with grease -G 052 753 A2-.

Mount the tyre with the DOT marking pointing towards the outside of the wheel. This applies only to the left side of the vehicle for directional tyres.

For directional tyres mount a wheel/tyre combination for the right side of the vehicle as spare wheel.

Disc wheel

Note

- ◆ Because of design variations the disc wheel and wheel trim cap may differ from the figure.
- ◆ When using anti-theft wheel bolts, the anti-theft bolt must be as close as possible to the valve.

1 - Tyres

2 - Wheel rims

- 5J x 13, ET 35
- 5J x 14, ET 35
- 6J x 14, ET 43
- 6J x 15, ET 43

3 - Wheel bolt, 120 Nm

Note

When using anti-theft wheel bolts for steel rims, the anti-theft bolt must be mounted in direction of the valve.

4 - Remove wheel trim cap

- remove with pull-off hook
⇒ item 5.

Note

When using anti-theft wheel bolts for steel rims, first assemble the wheel trim cap onto the anti-theft bolt (at valve).

5 - Pull-off hook

- included in tool kit

6 - Wheel bolt key

- included in tool kit

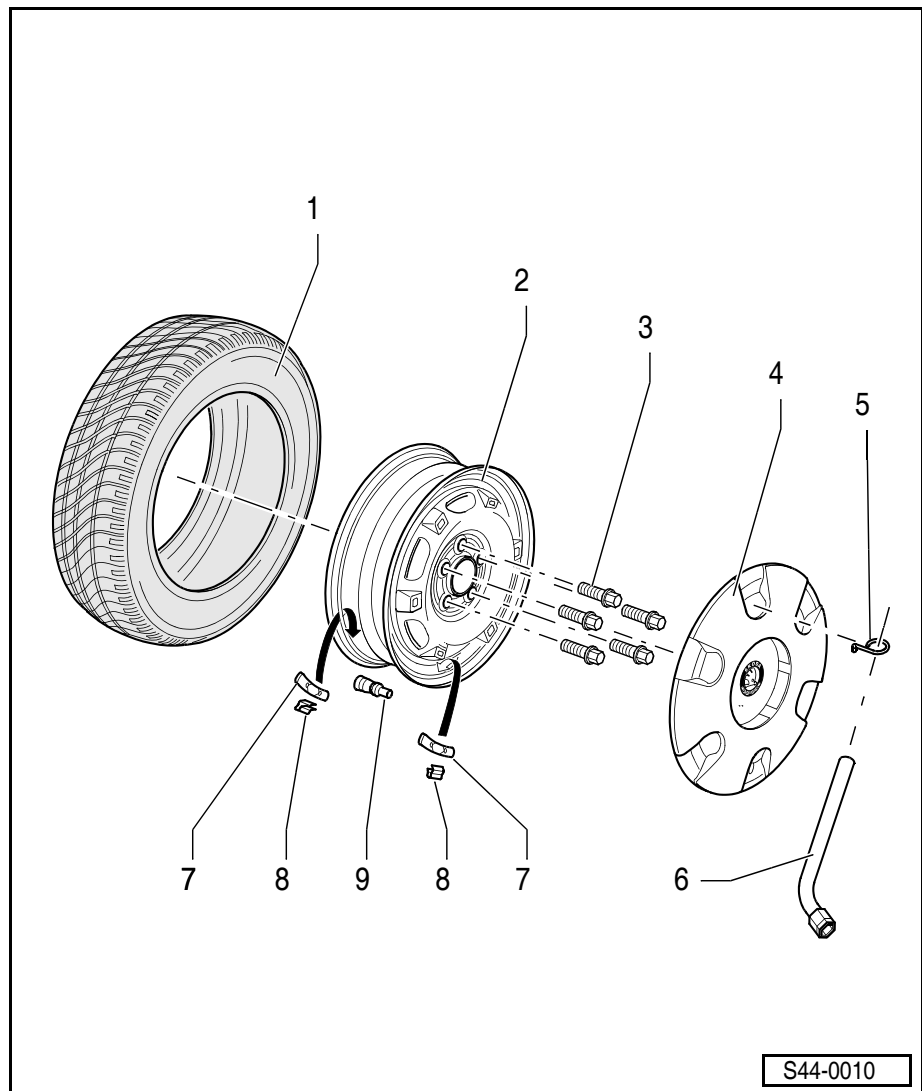
7 - Balancing weights

- max. 60 g allowed per rim flange

8 - Retaining spring for balancing weights

9 - Valve

- only use valve in accordance with spare part catalogue



Light-alloy wheel

Light-alloy rim 6J x 14, ET 43

i Note

Because of design variations the light alloy rim and wheel trim cap may differ from the figure.

- 1 - Tyres
- 2 - Light-alloy rim
 - 6J x 14, ET 43
- 3 - Anti-theft wheel bolt, 120 Nm
- 4 - Cap
 - for anti-theft wheel bolt
⇒ item 3
 - Remove with pull-off hook
⇒ item 5.
- 5 - Pull-off shackle
 - included in tool kit
- 6 - Wheel bolt key
- 7 - Adapter for anti-theft wheel bolt
 - included in tool kit
- 8 - Wheel trim cap
 - can only be removed once
the wheel has been removed
 - removing and installing

i Note

Do not use a pull-off hook or other tools, e.g. screwdriver as this could damage the wheel trim cap.

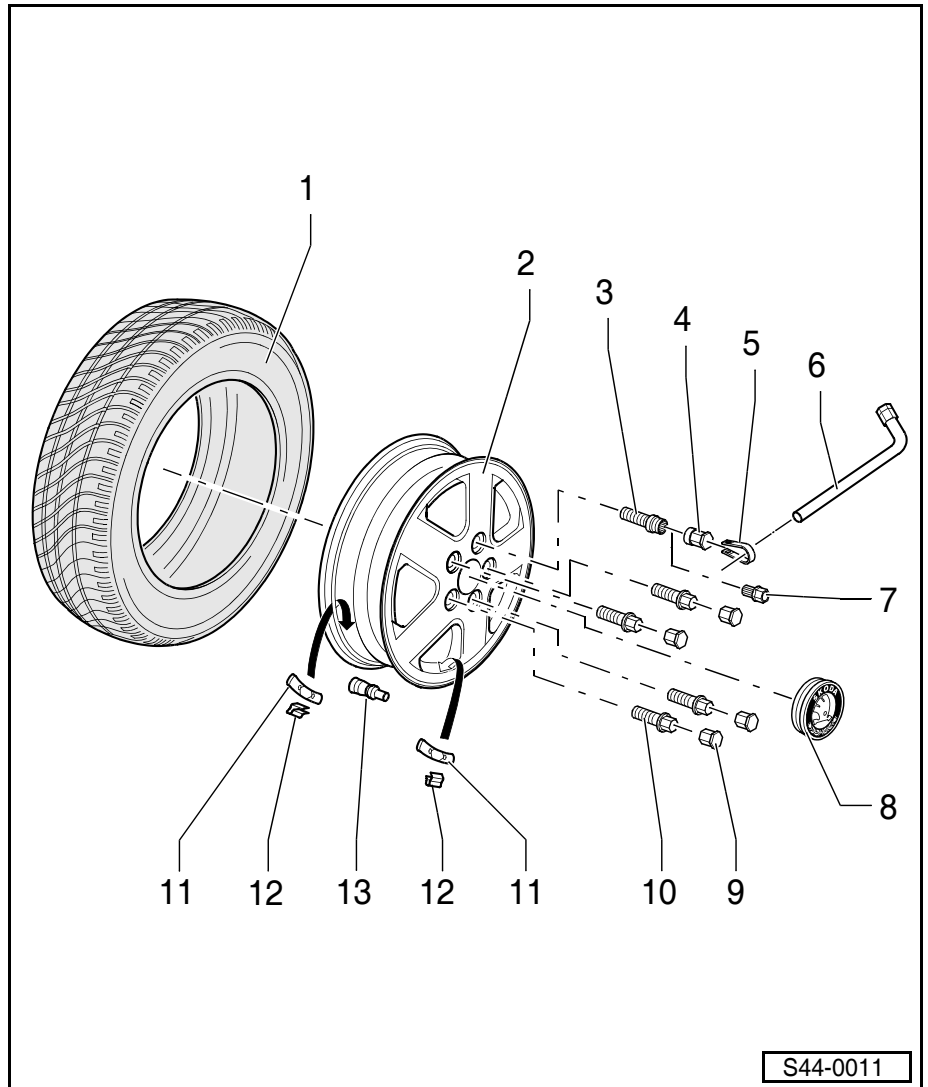
Removing:

Push the wheel trim cap towards the outside from the inside of the rim.

Installing:

Push-in the wheel trim cap from the outside of the rim, it clicks audibly.

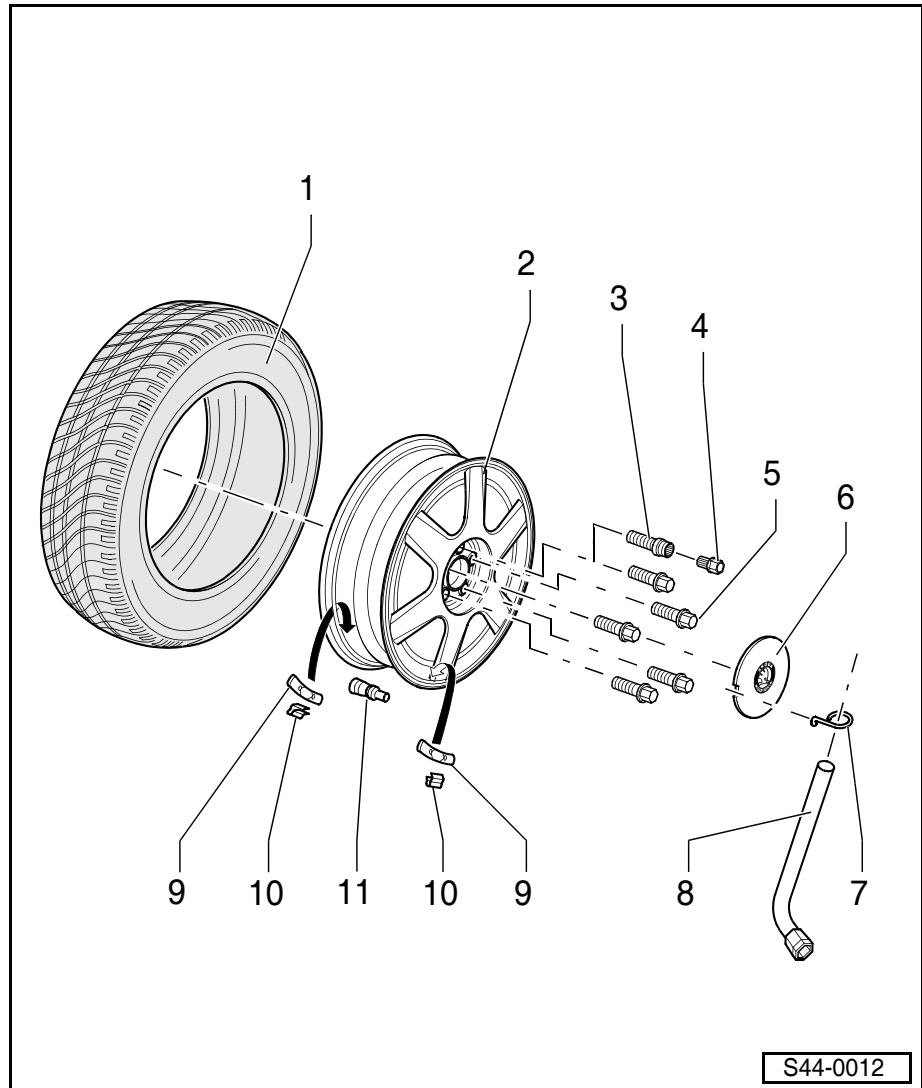
- 9 - Cap
 - for wheel bolt ⇒ item 10
 - Remove with pull-off hook ⇒ item 5.
- 10 - Wheel bolt, 120 Nm
- 11 - Balancing weights
 - max. 60 g allowed per rim flange
- 12 - Retaining spring for balancing weights
- 13 - Valve
 - only use valve in accordance with spare part catalogue



Light-alloy rim 6J x 15, ET 43** Note**

Because of design variations the light alloy rim and wheel trim cap may differ from the figure.

- 1 - Tyres
- 2 - Light-alloy rim
 - 6J x 15, ET 43
- 3 - Anti-theft wheel bolt, 120 Nm
- 4 - Adapter for anti-theft wheel bolt
 - included in tool kit
- 5 - Wheel bolt, 120 Nm
- 6 - Wheel trim cover
 - remove with pull-off hook
⇒ item 7.
- 7 - Pull-off hook
 - included in tool kit
- 8 - Wheel bolt key
- 9 - Balancing weights
 - max. 60 g allowed per rim flange
- 10 - Retaining spring for balancing weights
- 11 - Valve
 - only use valve in accordance with spare part catalogue



44-2 Vehicle alignment

General points

The vehicle must only be aligned using an alignment gauge released by the manufacturer!

We recommend you align both the front and rear axles during each chassis alignment procedure.

Otherwise correct vehicle driving behaviour cannot be guaranteed!



Note

- ◆ *Only perform a vehicle alignment after the first 1000 to 2000 km to allow the helical springs to fully settle.*
- ◆ *During adjustment work try to approximate the nominal values.*

If the fitting position of the rear axle and hence the running direction of the vehicle are not considered this could result in a skew steering wheel.



Note

- ◆ *Before removing mark the steering wheel position relatively to the steering column.*
- ◆ *This position must not be changed! Otherwise the central position of the gear rack cannot be guaranteed!*
- ◆ *Steering columns supplied as spare parts do not have dotting marks. These steering columns must be dot marked after chassis alignment and a subsequent test drive.*
- ◆ *vehicles with ABS/EDL/TCS/ESP BOSCH 5.7 If the steering wheel is offset on these vehicles, a null balance of the steering angle sender -G85- is carried out (either using the vehicle system tester -V.A.G 1552- ⇒ Chapter 45-13 or using the vehicle diagnosis, measurement and information system -VAS 5051- ⇒ Chapter 45-4).*
- ◆ *vehicles with ABS//TCS/ESP BOSCH 8.0 If the steering wheel is offset on these vehicles, a null balance of the steering angle sender -G85- is carried out (either using the vehicle system tester -V.A.G 1552- ⇒ Chapter 45-14 or using the vehicle diagnosis, measurement and information system -VAS 5051- ⇒ Chapter 45-4).*

It is necessary to perform a vehicle alignment in the event of:

- ◆ incorrect driving behaviour
- ◆ damage caused by accident and if parts have been replaced
- ◆ axle parts have been removed
- ◆ there is unilateral tyre wear

Front axle part replaced	Chassis alignment required		Rear axle part replaced	Chassis alignment required	
	yes	no		yes	no
Axle link	X		Shock absorber		X
Wheel-bearing housing	X		Helical spring		X
Track rod/track-rod ends	X		Complete rear axle	X	
Steering gear	X				
Assembly carrier	X				
Suspension strut or shock absorber or helical spring	X				
Console for engine-gearbox assembly carrier	X				
Anti-roll bar	X				

Test requirements

- Determining the running gear version according to the vehicle data sticker ⇒ Chap. 00-1.
- Check the wheel suspension, steering and steering linkage for unauthorised clearance and damage, if necessary repair.
- Check tyre inflation pressure, if necessary correct ⇒ Inspection and Maintenance or ⇒ fuel-tank cap sticker.
- Check the tyre tread depth. The difference between the left and right tyres on an axle must not exceed 2 mm.
- The unladen weight of the vehicle must correspond with the vehicle documents.

Unladen weight:

Weight of the vehicle with full fuel tank and full water reservoir for windscreen wiper/washer and headlamp cleaning system, spare wheel, tool kit, jack and without driver. The spare wheel, tool kit and jack must be located in the position prescribed by the vehicle manufacturer.

- Vehicle must be aligned, with the springs having been repeatedly deflected and having returned to their original position.
- Make sure that during alignment no sliding base and no rotating plate touches the limit stop.

Note!

- The measuring device must be positioned and adjusted in compliance with the specifications; follow the manufacturer's instructions!

If necessary obtain information on your alignment gauge from the manufacturer.

In the course of time the alignment platform and alignment gauge/alignment computer may deviate from their original adjustment/setting.

The alignment platform and alignment gauge/alignment computer must be tested and adjusted during a maintenance operation at least once a year or following the manufacturer's instructions and if necessary be adjusted!

Treat these precision instruments with great care.

Measurement preliminaries

Special tools, test and measuring equipment and auxiliary items required

- ◆ Brake pedal arrester, e.g. -V.A.G 1238/B- or -V.A.G 1869/2-
- ◆ Open-jawed wrench insert waf 22, e.g. -V.A.G 1332/12-
- ◆ Alignment/measuring gauge
- ◆ Weights, e.g. sand bags approx. 10 kg

The lateral runout on the rims must be balanced (compensated). Otherwise the alignment result will be distorted.

Correct toe-in adjustment is impossible if the rim runout has not been compensated!

To this end comply with the instructions of the alignment gauge manufacturer.

- Perform a rim runout compensation.
- Lower vehicle and deflect the springs.
- Fit Brake pedal arrester, e.g. -V.A.G 1238/B- or -V.A.G 1869/2- and activate the brake pedal with Brake pedal arrester.

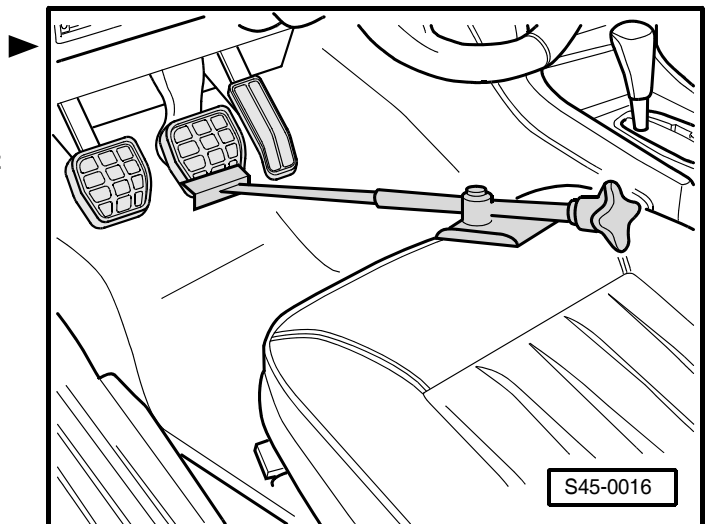
Overview of the work sequence for vehicle alignment

The following sequence of work steps must always be respected!

- 1 - Find out what chassis has been mounted in the vehicle. This information can be found on the vehicle data sticker ⇒ Chap. 00-1
- 2 - Check camber on front axle, if necessary take the mean ⇒ 44-2 page 4
- 3 - Check camber on rear axle ⇒ 44-2 page 5
- 4 - Check track on rear axle ⇒ 44-2 page 5
- 5 - Check track on front axle, if necessary adjust ⇒ 44-2 page 5

The following always applies!

Always check the transversal inclination of the vehicle before adjustment if one of the measuring values is outside the tolerance ⇒ 44-2 page 4.



Chassis terms

⇒ Chapter 00-1

Nominal values for vehicle alignment

- ◆ Front axle nominal values ⇒ Chap. 00-1.
- ◆ Rear axle nominal values ⇒ Chap. 00-1.

Checking the transversal inclination of the vehicle

Transversal inclination of the vehicle: „Straight-ahead position“

It is possible the vehicle is skew if the measured values lie outside the tolerance for the front and rear axle nominal values ⇒ Chap. 00-1.

RHD vehicles or e. g. vehicles with an automatic gearbox may be slightly skew.

This is normal and is due to the fitting locations of the assemblies and the related weight transfer.

- Deflect the vehicle repeatedly and allow the springs to return to their original position.



Note

Only determine dimension -a- on the rear axle.

Determining dimension -a- for the left and right vehicle side. ►

a_{left} - left vehicle side

a_{right} - right vehicle side

$\alpha = 90^\circ$

- Compare dimensions a_{left} and a_{right} .

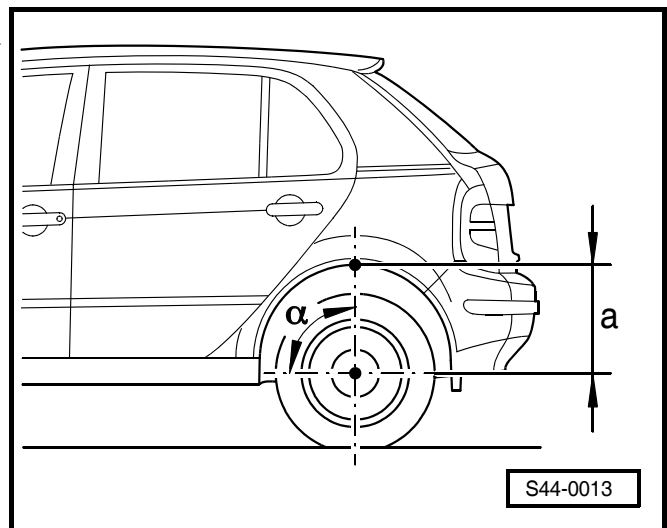
The deviation between a_{left} and a_{right} must neither exceed nor fall short of ± 5.0 mm.

- Correct any deviations outside tolerance ± 5.0 mm.

If the deviation is exceeded, e.g. +8.0 mm, correct the difference on the rear axle on the relevant side by placing weights in the boot.

If the deviation falls short of e.g. -8.0 mm, correct the difference on the front axle by placing weights on the relevant suspension strut dome.

Suitable weights are e.g. sand bags approx. 10 kg



Checking the camber on the front axle, if necessary take the mean

The camber cannot be adjusted, it can only be centered.

If the values lie outside the tolerance the transversal inclination must be checked and if necessary adjusted
 ⇒ 44-2 page 1.

It is only possible to evenly center the camber within the tolerance range by shifting the complete engine-gearbox assembly carrier.

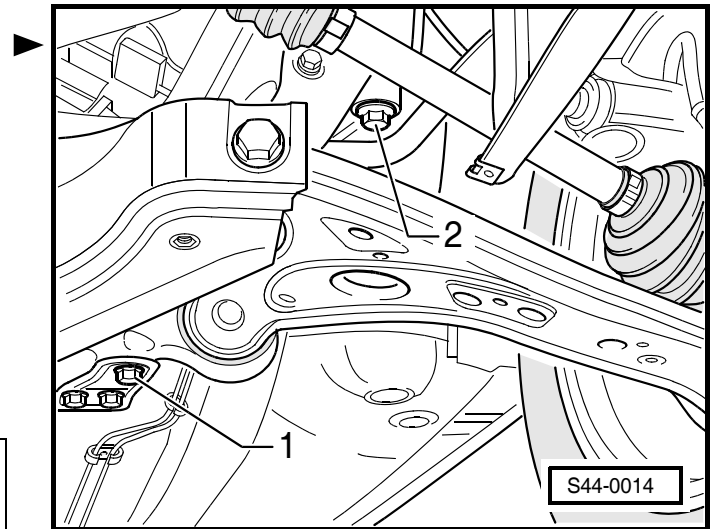
- Release screws -1- and -2-.
- Move the engine-gearbox assembly carrier with console until the camber is equal on both sides.
- Subsequently check the castor.

When moving the engine-gearbox assembly carrier with console the castor may change.

- Tighten the console with the engine-gearbox assembly carrier with new screws.

Tightening torque:

Console for engine-gearbox assembly carrier on body.	Tighten 70 Nm + 90°
◆ Use new screws!	



Checking the camber on the rear axle

The camber cannot be adjusted.

If the values lie outside the tolerance the transversal inclination must be checked and if necessary adjusted
 ⇒ 44-2 page 1.

If the measured values still lie outside the tolerance, check the axle body for damage and if necessary replace.

Checking the track on the rear axle

The track cannot be adjusted.

If the values lie outside the tolerance the transversal inclination must be checked and if necessary adjusted
 ⇒ 44-2 page 1.

If the measured values still lie outside the tolerance, check the axle body for damage and if necessary replace.

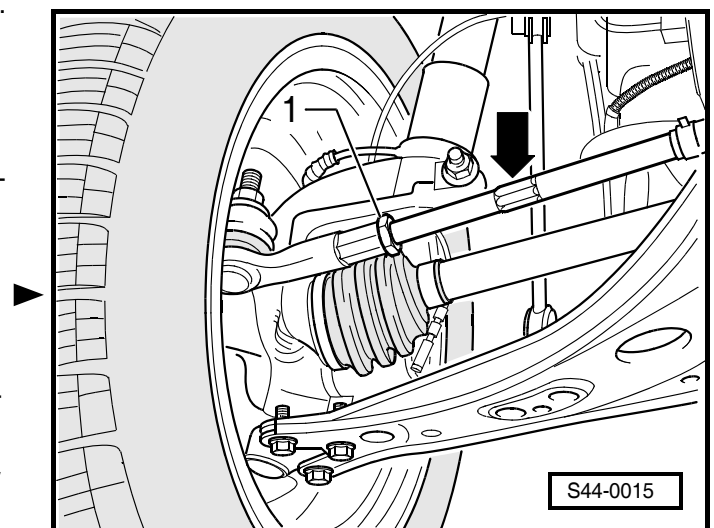
Checking the tracking on the front axle, adjusting if necessary

If the values lie outside the tolerance the transversal inclination must be checked and if necessary adjusted
 ⇒ 44-2 page 1.

- Release conternut -1- .
- Adjust track by turning the left and/or right track rod.

Use an open-jawed spanner on the hexagon bolt -arrow- of the track rod.

Check that the bellows have not become twisted after turning the track rods!



Twisted bellows wear fast.

- Tighten conternut -1- with 50 Nm and again check track value.

After tightening conternut -1- the set value may change slightly.

Make sure this value remains within the tolerance for the nominal value. If this is not the case repeat the track adjustment operation.

Checking the left and right steering angle

This check is only required if

- ◆ the steering angles differ by more than 2° from the steering centre.
- ◆ at full steering angle the tyres come into contact with components on the front axle or body on one side,
- ◆ the left/right turning clearance circle differs.

The distance between the components on the front axle and the tyres -arrow- must be the same on both sides at maximum steering angle.

If the distance is unequal it is possible to correct the distance by turning the left and right track rod.

Example:

The distance between the front axle components and the tyres is smaller on the left than on the right.

- Release the conternuts on the track rods.
- Turn the track rod on the left (unscrew from track-rod end).
- Turn the track rod on the right to the same extent (screw into track-rod end).
- Check overall track.

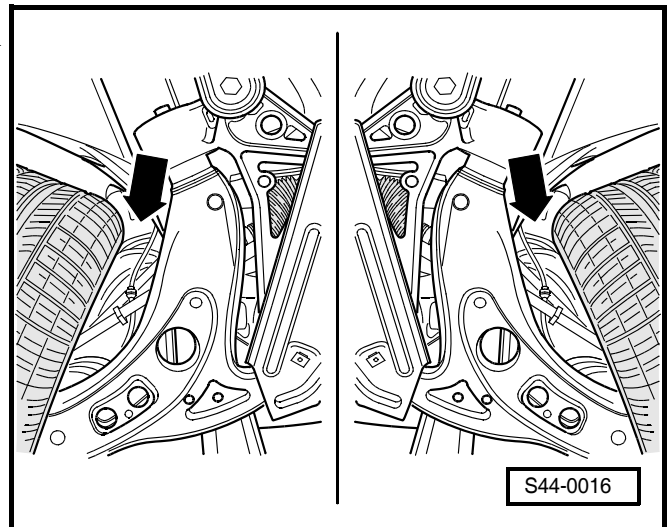
After this adjustment procedure the overall track must correspond with the specified nominal value!

- Tighten conternuts with 50 Nm.

After tightening the conternuts the set value may change slightly.

Make sure this value remains within the tolerance for the nominal value. If this is not the case repeat the overall track adjustment operation.

Check that the bellows have not become twisted after turning the track rods!



Calculation of the misalignment on the rear axle



Note

The indicated values are only given as an example.

- For track values with the same preceding sign (+/+ or -/-) subtract the smaller value from the greater value and divide by 2.

Track value on the rear left wheel

+15'

Track value on the rear right wheel

+5'

$$15' - 5' = 10'$$

$$10' : 2 = 5'$$

Deviation from the running direction = 5'

- Value with a different preceding sign (+/-) are added up and the sum is divided by 2.

Track value on the rear left wheel

+15'

Track value on the rear right wheel

-5'

$$15' + 5' = 20'$$

$$20' : 2 = 10'$$

Deviation from the running direction = 10'

The relevant result is the actual deviation of the running direction from the longitudinal vehicle axis.

