

Audi 100 1991 ➤

Brake system

Edition 04.1998



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List of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Audi 100 1991 ➤

Brake system

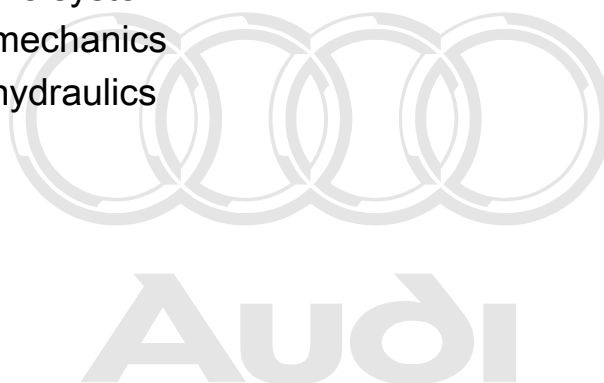
Repair Group

00 - Technical data

45 - Anti-locking brake system

46 - Brakes, Brake mechanics

47 - Brakes, Brake hydraulics



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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 - Technical data

1 - Technical data

1.1 - Technical data

1.2 - Brakes

Front brakes					
Brake calipers		Teves	Internal	Double piston up to 06.96	Double piston as of 06.96
Front brake discs	ømm	288	310/312	314	323
Front brake disc, piston diameter	mm	57	60	42.8	42.8
Thickness of internally ventilated brake disc	mm	25	25	30	30
Brake disc wear limit	mm	23	23	28	28
Thickness of unventilated brake disc	mm	15	-	-	-
Brake disc wear limit	mm	13	-	-	-
Brake pad thickness	mm	14	12	14	14

Rear-wheel brake (disc)		
Rear brake calipers		Lucas
Rear brake caliper, piston diameter	mm	43
Brake disc, ventilated	ømm	269
Brake disc thickness, ventilated	mm	20
Brake disc wear limit, ventilated	mm	18
Brake disc, non-ventilated	ømm	245
Brake disc thickness, non-ventilated	mm	10
Brake disc wear limit, non-ventilated	mm	8
Brake pad thickness	mm	12
Brake pad wear limit	mm	2

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Rear brake (drum)		
Brake drum, rear	ømm	230
Wheel-brake cylinder	ømm	20.64
Brake pad thickness	mm	5
Brake pad, width	mm	40
Brake pad wear limit	mm	2.5



45 - Anti-locking brake system

1 - Safety precautions and general servicing information

1.1 - Safety precautions and general servicing information

Warning!

The anti-lock brake system is basically maintenance-free.

Testing, assembly and service work is only to be performed by specially trained personnel.

Failure to observe the points described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.

- ◆ Before servicing anti-lock brake system, establish cause of damage by means of self-diagnosis.
- ◆ Check encoding if a new hydraulic control unit, is fitted.

=> Running Gear Self-Diagnosis; Repair Group 01

- ◆ Switch off the ignition before removing and installing components. If the vehicle is equipped with a coded radio, obtain the security code before disconnecting the earthing strap of the battery.

- ◆ Observe the relevant safety precautions and information when handling brake fluid.

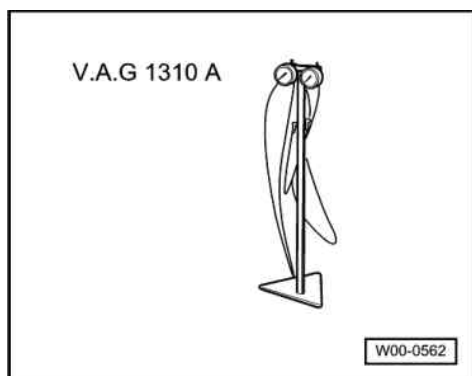
=> Special Information; Running Gear No. 21

- ◆ If hydraulic system has to be opened, braking system is to be bled on completion of work (e.g. with V.A.G 1869) => Page 121.
- ◆ During the concluding road test, ensure that an ABS-controlled brake application is carried out at least once (can be felt from the pulsing of the brake pedal).
- ◆ Absolute cleanliness is required when working on the anti lock brake system, and it is not permitted to use any products which contain mineral oil, such as oil, grease etc.
- ◆ Thoroughly clean all connection points and surrounding areas before loosening them, but do not use aggressive cleaning agents such as brake cleaner, petrol, thinners or similar.
- ◆ Place removed parts on a clean surface and cover.
- ◆ Carefully cover or seal over components if repairs cannot be carried out immediately. (Use plugs, - repair set H0 698 311 A).
- ◆ Use lint-free cloths.
- ◆ Only remove replacement parts from packaging immediately prior to installation.
- ◆ Only use genuine packed parts.
- ◆ When the system is open do not work with compressed air and do not move the vehicle.
- ◆ Ensure that no brake fluid flows into the electrical connectors.
- ◆ When carrying out spray painting work, the electronic control unit may be exposed for short periods to a maximum temperature of 95 °C and for longer periods (about 2 hours) to a maximum temperature of 85 °C.
- ◆ Before carrying out welding work with electric welding equipment

=> General notes, Body Repairs, Safety Precautions

1.2 - High- and low pressure test

Special tools, testers and workshop equipment required



- ♦ V.A.G 1310 A Braking system tester

Test requirements:

Make sure that the brake system (hydraulic unit, brake hoses, brake pipes and brake calipers) works properly and is free of leaks.

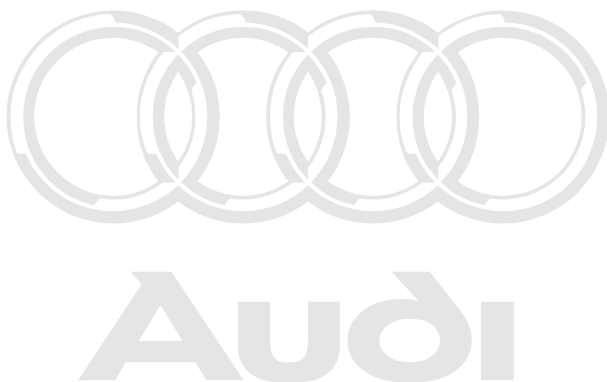
High pressure test:

- Remove bleeder screw at one of the front brake calipers. Connect pressure gauge of V.A.G 1310 A and bleed system.
- Insert brake pedal depressor between brake pedal and driver's seat. Apply pressure to brake pedal until the gauge indicates a pressure of 50 bar. The pressure must not drop by more than 4 bar during the test period of 45 seconds. Replace brake master if drop in pressure exceeds the above figure.

Low pressure test:

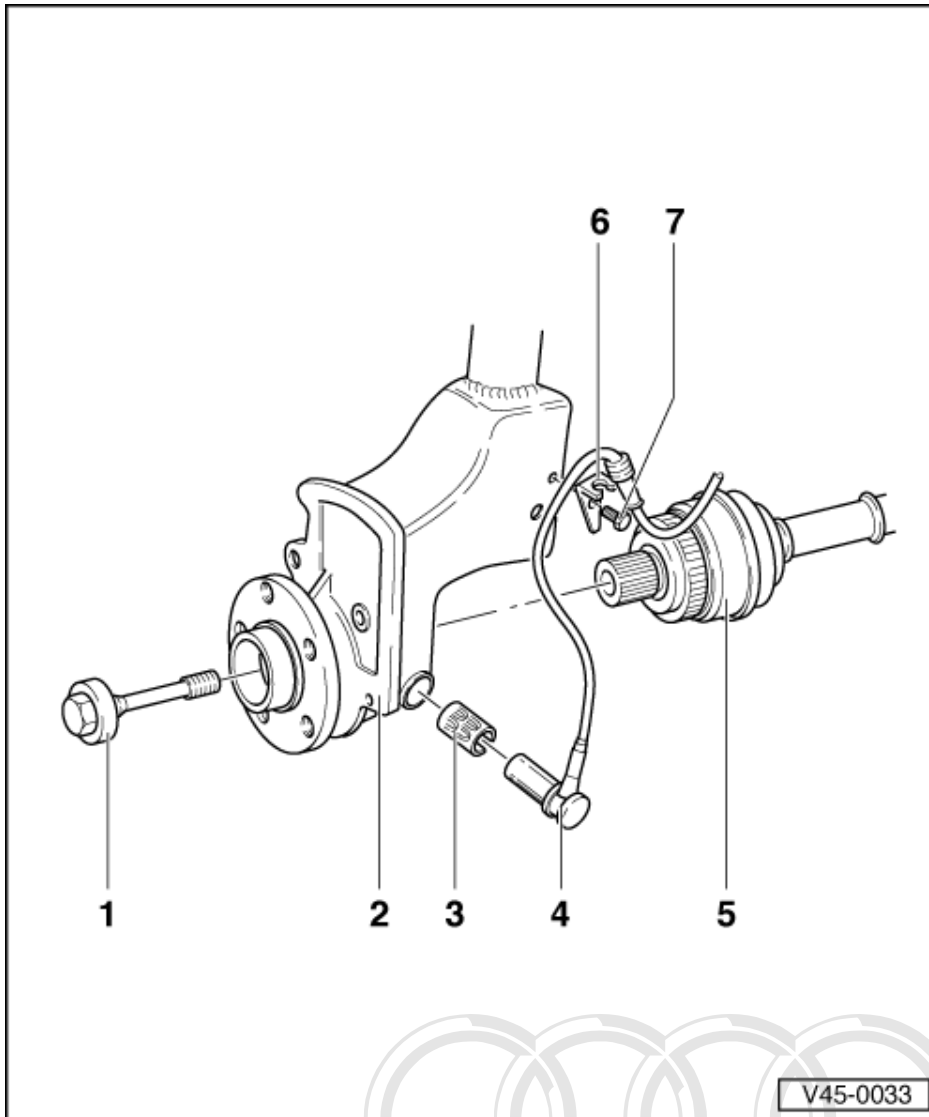
- Move the brake pedal depressor back until the pressure gauge indicates a pressure of 6 bar.
- The pressure must not drop by more than 1 bar during the test duration of 3 minutes.

Replace hydraulic unit if drop in pressure exceeds the above figure.



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4 45 - Anti-locking brake system



4 Speed sensor

- ♦ Identical part on left and right
- ♦ Removing and installing
=> Page 6
- ♦ Plug connection for speed sensor =>Page 6

5 Drive shaft with rotor

- ♦ Inspect rotor for signs of dirt and damage => Page 11
- ♦ Replace outer CV joint with rotor if rotor is damaged.

=> Audi 100 1991; Running gear, Front and four-wheel drive; Rep.- Gr. 40; Removing and installing drive shaft

- ♦ Outer CV joint is supplied as a replacement part with the rotor.

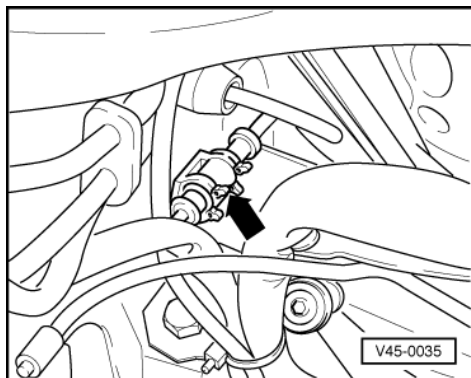
6 Bracket

7 Hexagon bolt, 10 Nm

2.2 - Removing and installing speed sensor

Removing

- Switch off ignition.



- Loosen wheel bolts.
- Jack up vehicle.
- Remove wheel.
- -> Unclip speed sensor wiring from retainers -arrow-.
- Detach connector of speed sensor wiring.
- Pull ABS speed sensor from wheel bearing housing.

Installing

- Renew clamping sleeve (=> Page 4 -Item 3).
- Push speed sensor into wheel bearing housing by hand.
- Route speed sensor cable back in original position - see removal.
- Connect speed sensor wiring and press into retainers.
- Fit wheel and tighten to 120 Nm.
- Turn steering to full left lock and full right lock and check clearance of speed sensor wiring.

2.3 - Checking rotor

- Jack up vehicle.
- Remove wheel.
- Pull speed sensor out of wheel bearing housing.
- Inspect rotor for signs of damage or dirt.

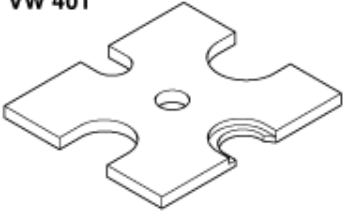
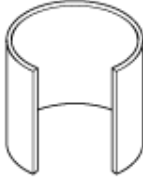
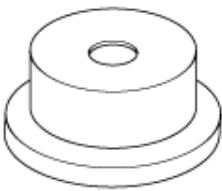
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If the rotor is damaged or dirty remove the drive shaft. In the event of damage, replace outer CV joint together with rotor.

- ♦ The outer CV joint is supplied as a replacement part with the rotor.

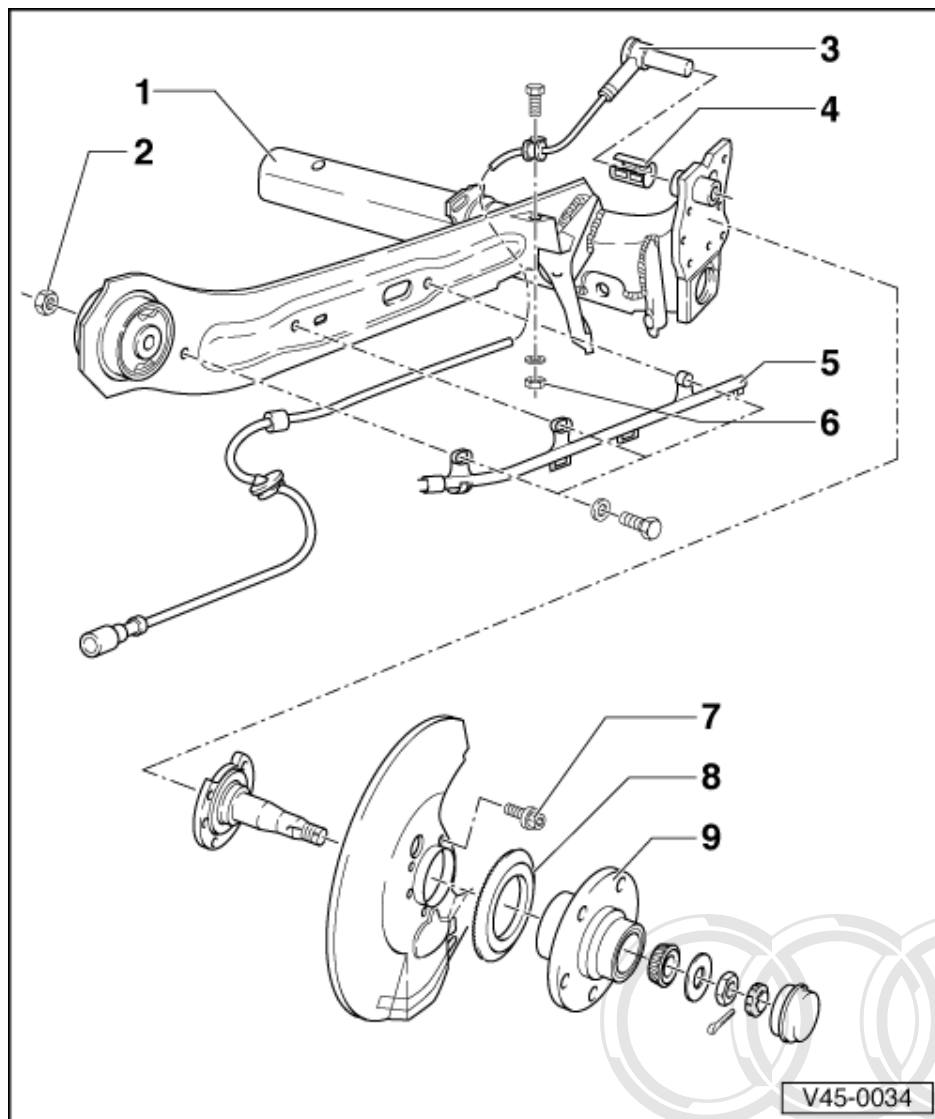
3 - Removing and installing components of ABS system on rear axle, FWD models

3.1 - Removing and installing components of ABS system on rear axle, FWD models

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32-119 	2050 
V.A.G 1331 	V.A.G 1332  W45-0002

Special tools, testers and workshop equipment required

- ♦ VW 401 Thrust plate
- ♦ VW 407 Thrust tool
- ♦ 32-119 Tube
- ♦ 2050 Thrust piece
- ♦ V.A.G 1331 Torque wrench
- ♦ V.A.G 1332 Torque wrench



1 Axle beam

- ◆ Since MY '97, brake pressure regulators have been fitted at axle beam to reduce brake pressure => Fig. 1

2 Hexagon nut 10 Nm

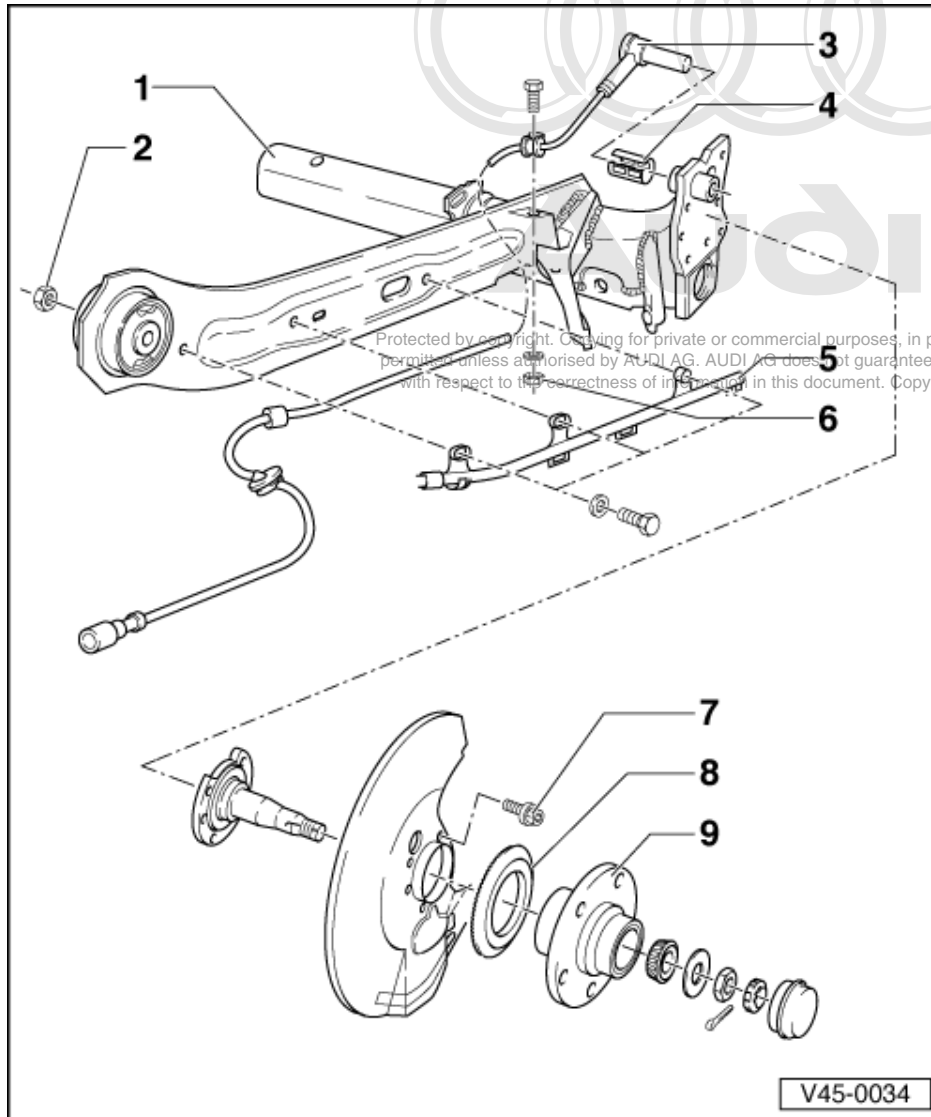
3 Speed sensor

- ◆ Identical part on left and right
- ◆ Removing and installing => Page 10
- ◆ Release plug connection of wheel speed sensor cable and separate. Unclip speed sensor wiring

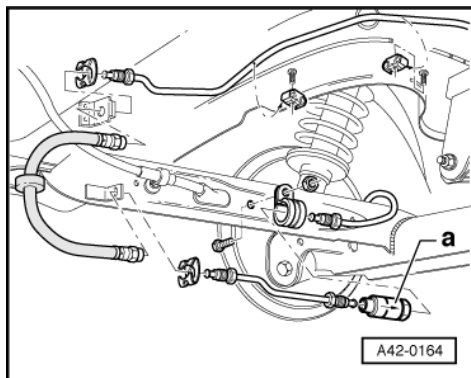
4 Clamping sleeve

- ◆ Renew each time after removing
- ◆ Identical part on left and right
- ◆ Grease all round with copper paste before inserting in wheel bearing housing
- ◆ Press home in wheel bearing housing

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- 5 Holder for speed sensor
- 6 Hexagon nut 10 Nm
- 7 Hexagon socket head bolt, 30 Nm
- 8 Rotor
 - ♦ Pressing in => Fig. 2
- 9 Wheel hub
 - ♦ Removing and installing



-> Fig.1 Brake pressure regulator at rear axle as of MY' 97

Since MY' 97, brake pressure regulators have been fitted at the rear axle to reduce brake pressure.

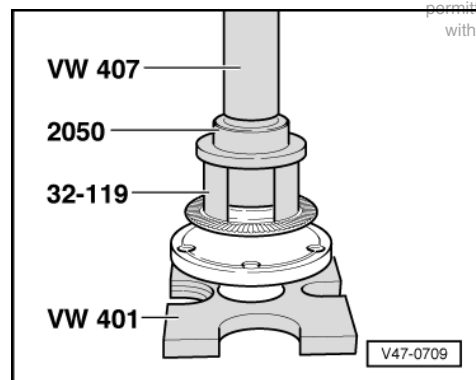
Replacement parts are only available as a set with part no. 4A0 698 401 A.

a - Brake pressure regulator

Note:

- ♦ When fitting, pay attention to correct installation position and direction of flow -arrow- of brake pressure regulator.
- ♦ The flow direction arrow faces away from the direction of travel.

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-> Fig.2 Pressing in rotor

- Removing and installing wheel hub

3.2 - Removing and installing speed sensor

Removing

- Switch off ignition.
- Lift rear seat out of its catches.
- Detach connector of speed sensor wiring.
- Loosen wheel bolts.
- Jack up vehicle.
- Remove wheel.
- Unclip speed sensor wiring from retainers.
- Pull speed sensor out of axle beam.

Installing

- Renew clamping sleeve (=> Page 8 -Item 4).
- Push speed sensor into wheel bearing housing by hand.
- Route speed sensor cable back in original position - see removal.
- Connect speed sensor wiring and press into retainers.
- Fit wheel and tighten to 120 Nm.

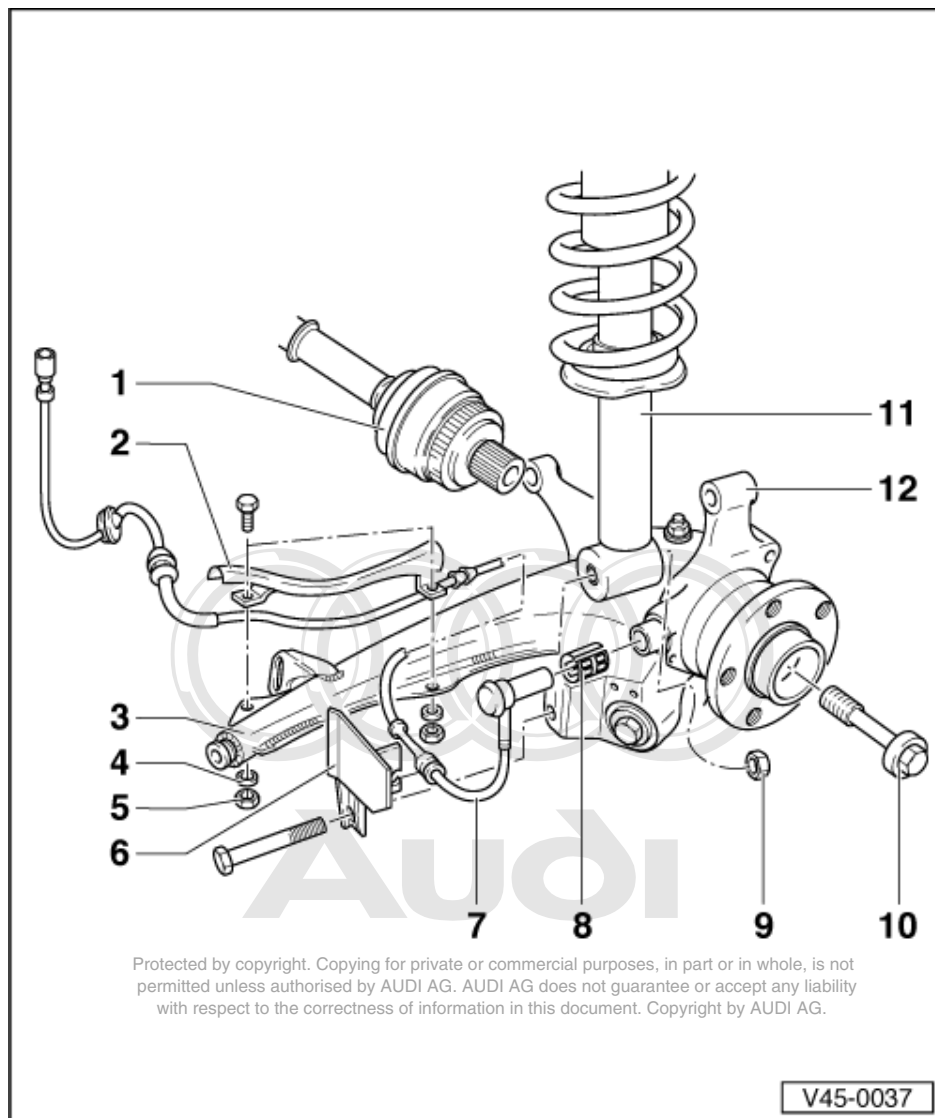
3.3 - Checking rotor

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- Jack up vehicle.
- Remove wheel.
- Pull speed sensor out of wheel bearing housing.
- Inspect rotor for signs of damage or dirt.
- Remove wheel hub if rotor is damaged
- Press in rotor =>Fig. 10 .

4 - Removing and installing components of ABS system on rear axle, 4WD models

4.1 - Removing and installing components of ABS system on rear axle, 4WD models



1 Drive shaft with rotor

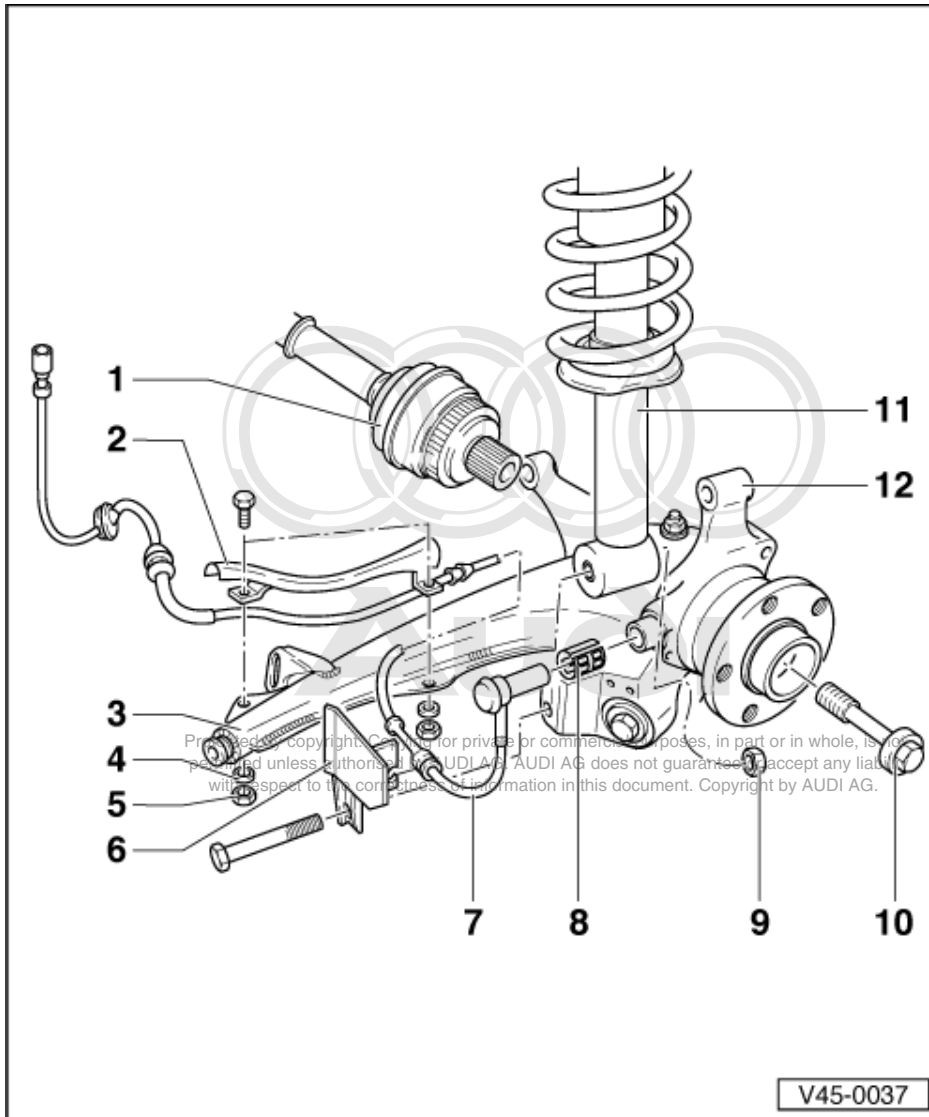
- ◆ Inspect rotor for signs of dirt and damage => Page 15
- ◆ If rotor is damaged, replace outer CV joint => Page 15
- ◆ Outer CV joint is supplied as replacement part with rotor

2 Bracket

3 Wishbone

4 Washer

5 Hexagon nut 10 Nm



6 Holder for speed sensor

7 Speed sensor

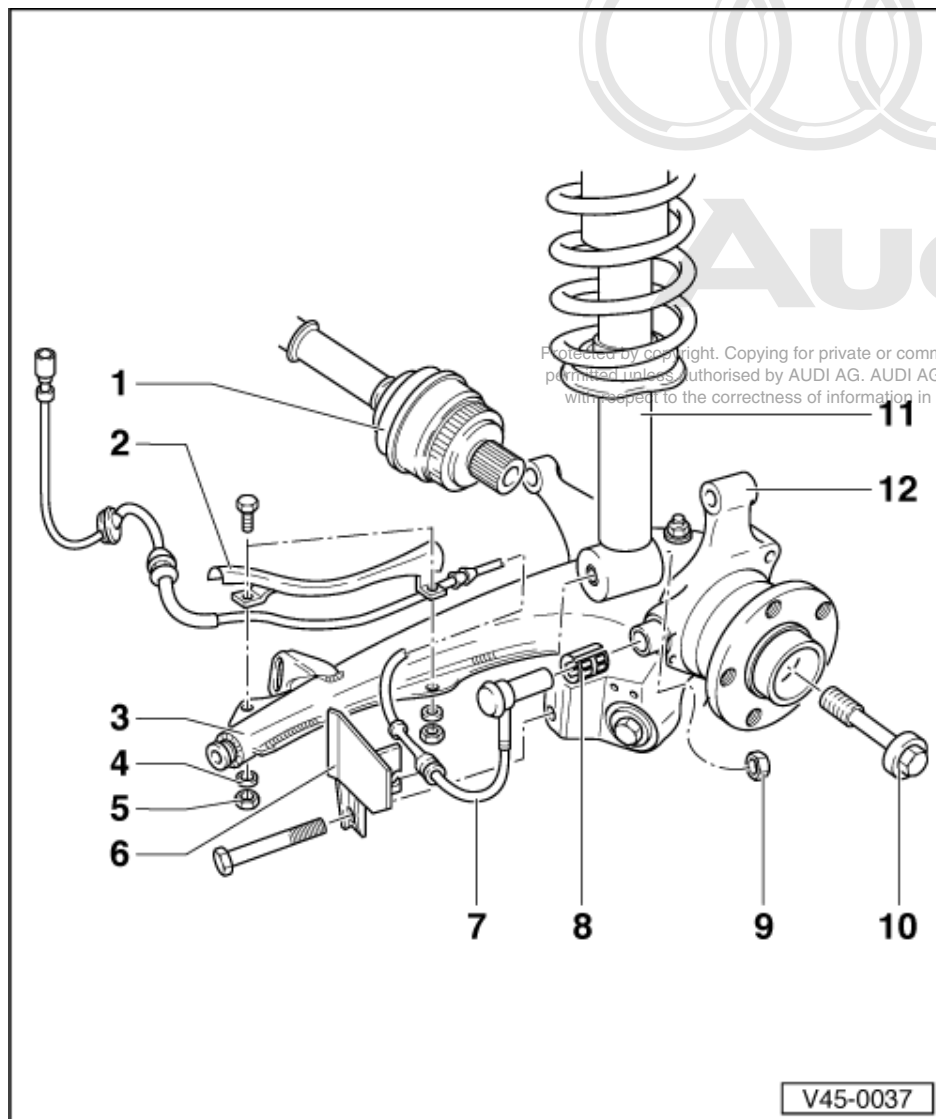
- ♦ Identical part on left and right
- ♦ Clean inside surface of hole before inserting sensor
- ♦ Renewing => Page 14

8 Clamping sleeve

- ♦ Renew each time after removing
- ♦ Identical part on left and right
- ♦ Grease all round with copper paste before inserting in wheel bearing housing
- ♦ Press home in wheel bearing housing

9 Self-locking nut, 90 Nm

- ♦ Renew each time after removing



10 Hexagon bolt

- ♦ Renew each time after removing
- ♦ 190 Nm and turn 180° further
Vehicle must be standing on the ground when tightening this bolt
- ♦ Switched from hexagon head to hexagon socket. Mixed combinations permitted

11 Suspension strut

12 Wheel bearing housing with wheel hub

4.2 - Removing and installing speed sensor

Removing

- Switch off ignition.
- Lift rear seat out of its catches.
- Detach connector of speed sensor wiring.
- Loosen wheel bolts.
- Jack up vehicle.
- Remove wheel.
- Unclip speed sensor wiring from retainers.
- Pull speed sensor out of wheel bearing housing.

Installing

- Renew clamping sleeve (=> Page 45-17 -Item 8).
- Push speed sensor into wheel bearing housing by hand.
- Route speed sensor cable back in original position - see removal.
- Connect speed sensor wiring and press into retainers.
- Fit wheel and tighten to 120 Nm.

4.3 - Checking rotor

- Jack up vehicle.
 - Remove wheel.
 - Pull speed sensor out of wheel bearing housing.
 - Inspect rotor for signs of damage or dirt.
 - If the rotor is damaged or dirty remove the drive shaft. In the event of damage, replace outer CV joint together with rotor.
- ♦ The outer CV joint is supplied as a replacement part with the rotor.

5 - Anti-lock brake system (ABS)

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5.1 - Anti-lock brake system (ABS)

Observe safety precautions => Page 2

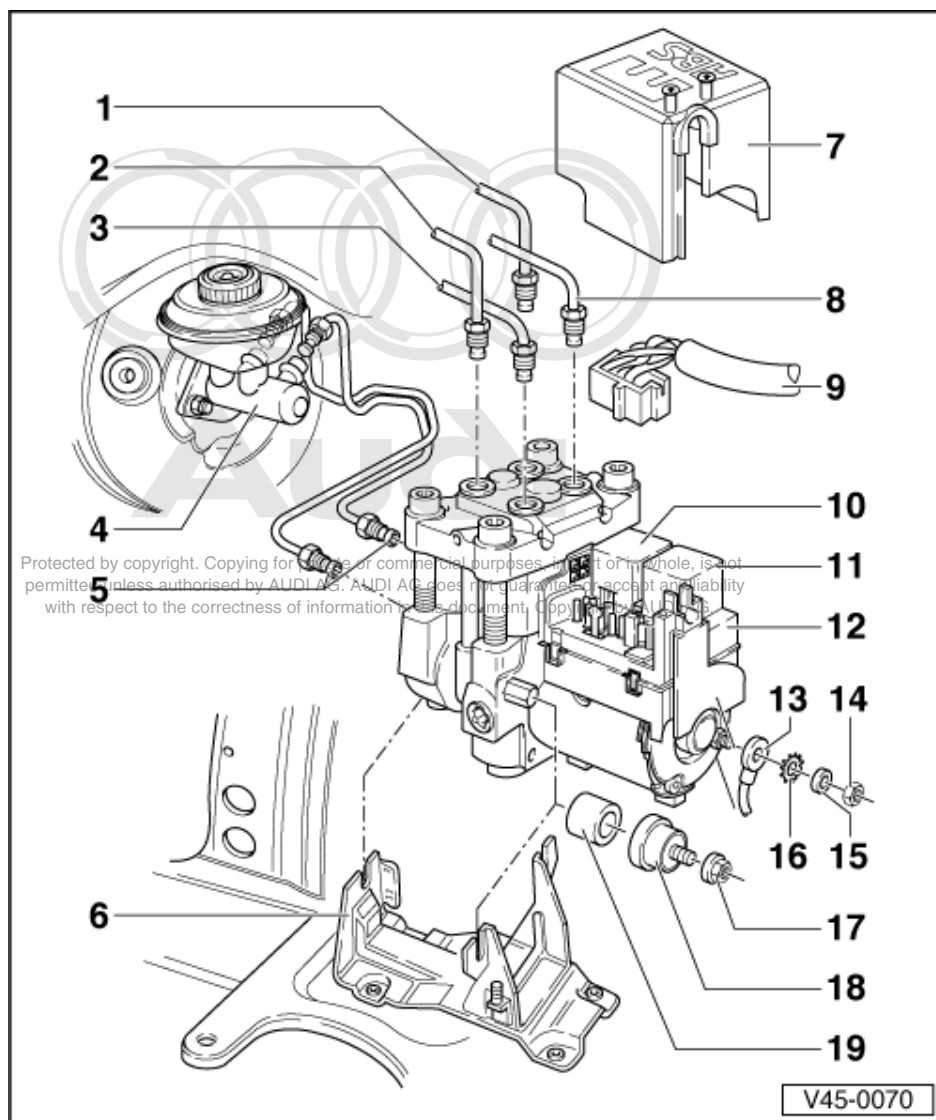
Warning!

The anti-lock brake system is basically maintenance-free.

Testing, assembly and service work is only to be performed by specially trained personnel.

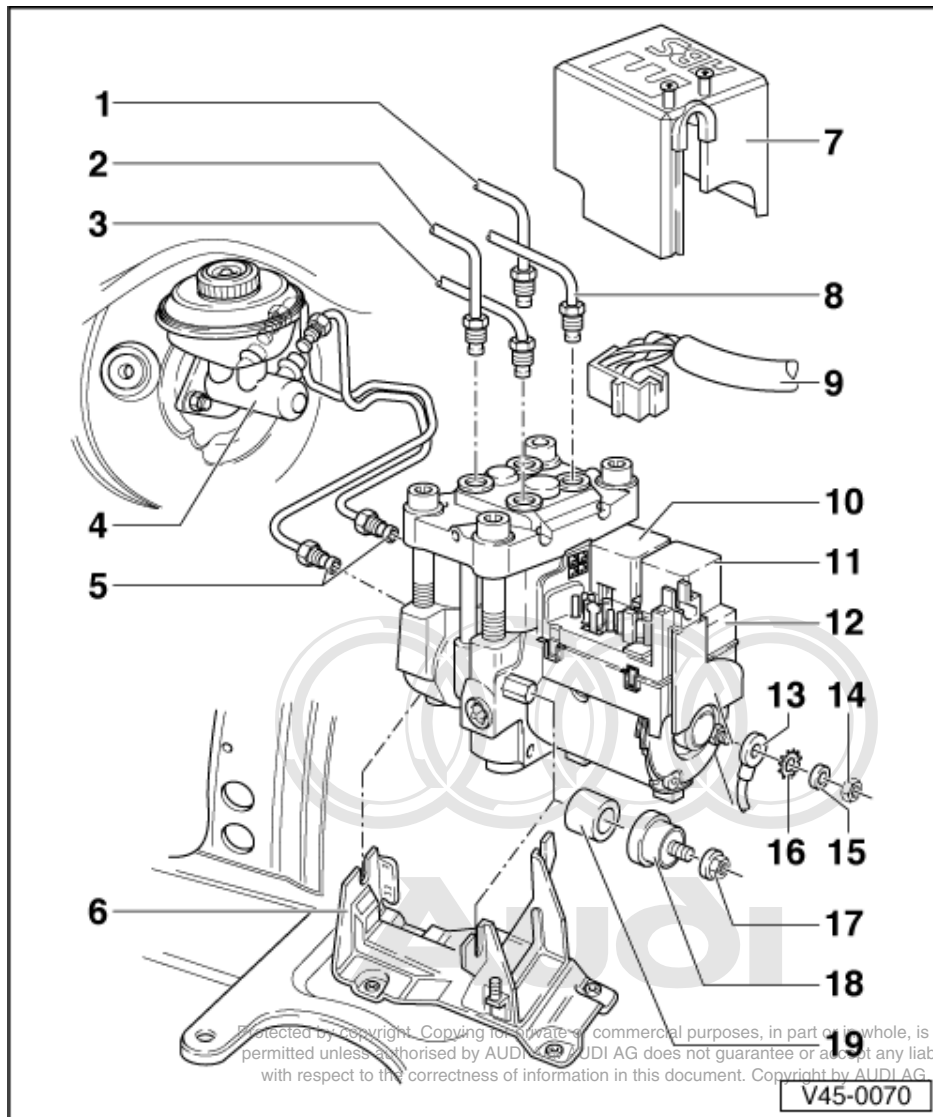
Failure to observe the points described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.

5.2 - Hydraulic unit and brake pipes

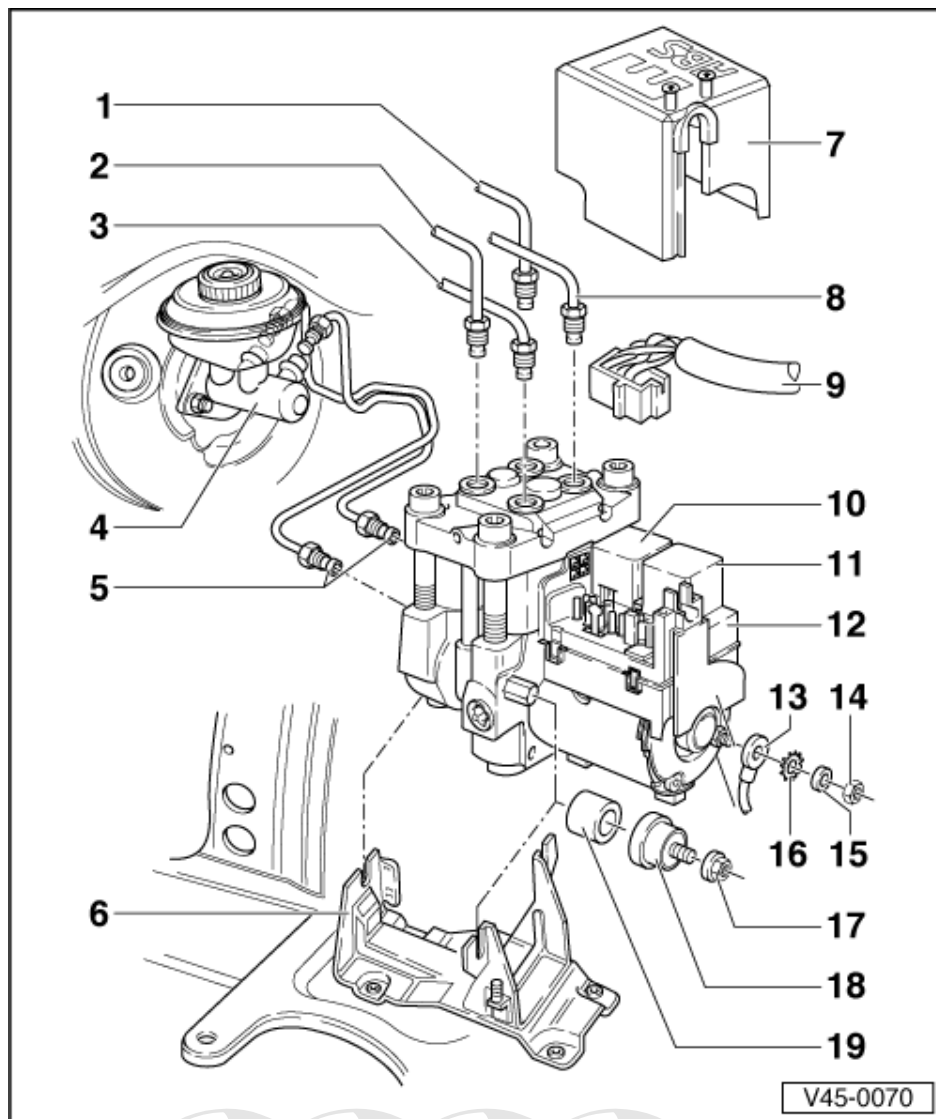


The tightening torque of the brake pipes is 15 Nm.

- 1 **Brake pipe**
 - ♦ Hydraulic unit to rear right brake caliper
- 2 **Brake pipe**
 - ♦ Hydraulic unit to rear left brake caliper
- 3 **Brake pipe**
 - ♦ Hydraulic unit to front right brake caliper
- 4 **Brake master cylinder and brake servo**
- 5 **Brake pipes**
 - ♦ Brake master cylinder to hydraulic unit
- 6 **Bracket for hydraulic unit**

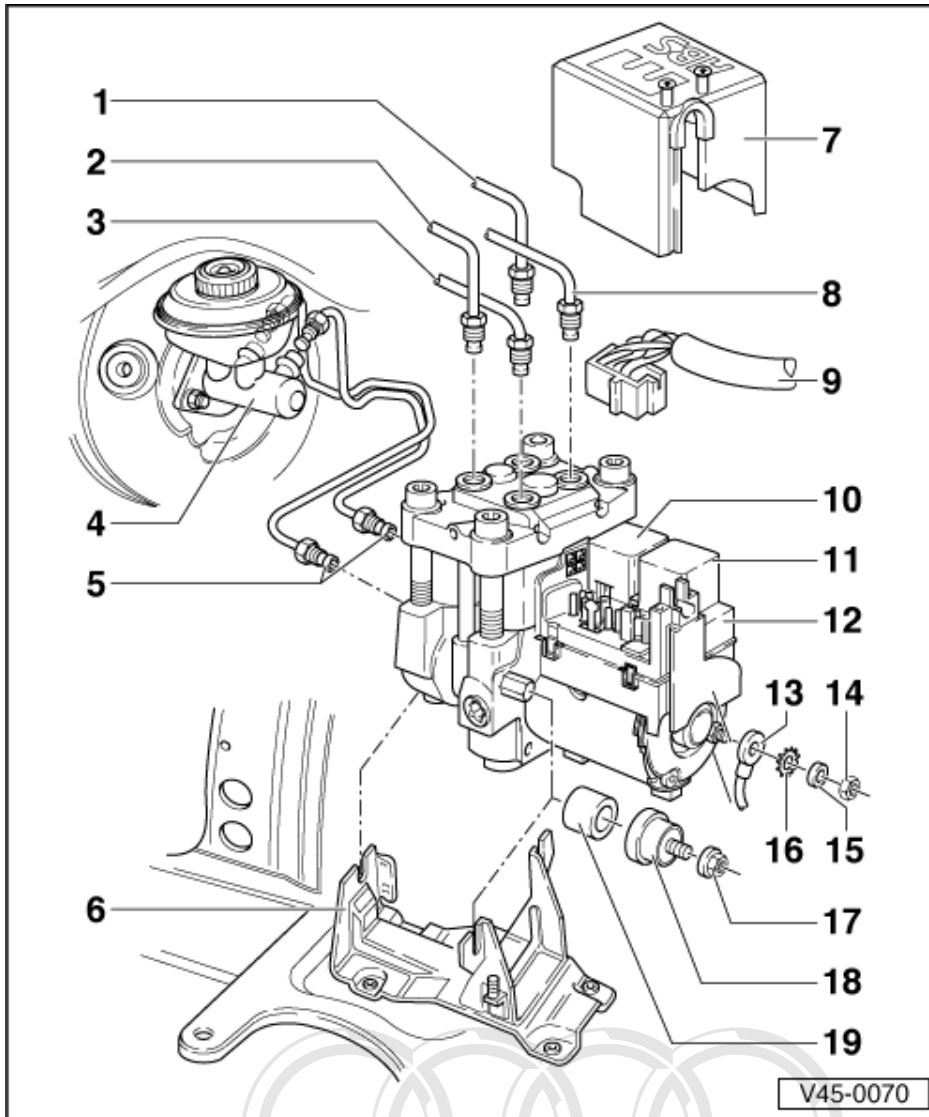


- 7 Cover
- 8 Brake pipe
 - ♦ Hydraulic unit to front left brake caliper
- 9 ABS-wiring harness
- 10 Relay for solenoid valves
- 11 Relay for return pump
- 12 ABS hydraulic unit
 - ♦ No repair work may be carried out on the hydraulic unit, with the exception of replacing both relays .
 - Never unfasten bolted joints
 - ♦ If necessary, replace hydraulic unit only as a complete assembly.
 - ♦ Replacement hydraulic units are supplied pre-bled



- ◆ Removing and installing the hydraulic unit
- Disconnect earthing strap from battery
- Seal the brake lines and connections immediately with dummy plugs
- If the hydraulic unit is replaced, bolt the new hydraulic unit onto the bracket-Item 6-. Remove the dummy plugs from the brake line connections. The brake lines should be connected in accordance with the designations on the hydraulic unit
- Bleed brake system => Page 121
- Carry out high- and low-pressure test => Page 3
- Perform electrical test

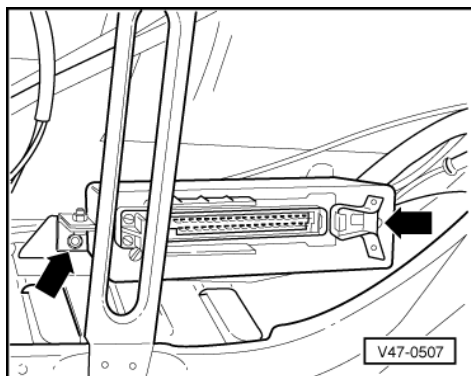
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- 13 Earth wire**
 ♦ Ensure good contact
14 Hexagon nut 10 Nm
15 Washer
16 Toothed lock washer
17 Self-locking nut, 7 Nm
 ♦ Renew each time after removing
18 Bush
19 Buffer

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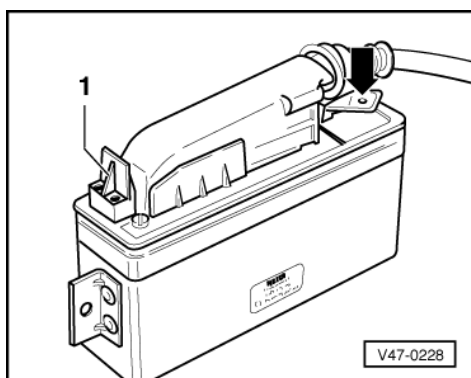
5.3 - Removing and installing ABS control unit



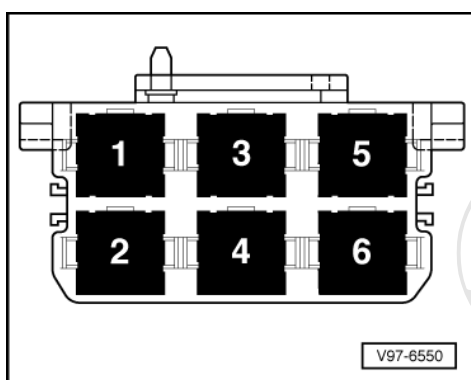
Location:

On left below rear seat

- Switch off ignition.
- Lift rear seat out of its catches.
- -> Remove both retaining bolts -arrows-



- -> Release connector -see arrow- and separate from control unit -J104.



-> Removing and installing combined relay

Location:

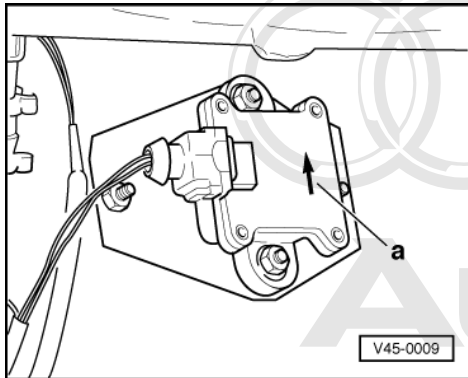
Behind A-pillar-trim at bottom left in auxiliary relay carrier (6-position), relay position 4

- Remove storage compartment for driver's side.

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- Remove A-pillar-trim.

Combined relay was discontinued as of 07.92.



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-> Removing and installing longitudinal acceleration switch Copyright by AUDI AG.

Location:

On left below rear seat

- Switch off ignition.
- Lift rear seat out of its catches.
- Arrow -a- indicates direction of travel.

Longitudinal acceleration switch was discontinued as of 07.92.

6 - Anti-lock brake system (ABS) with electronic differential lock

6.1 - Anti-lock brake system (ABS) with electronic differential lock

Observe safety precautions => Page 2

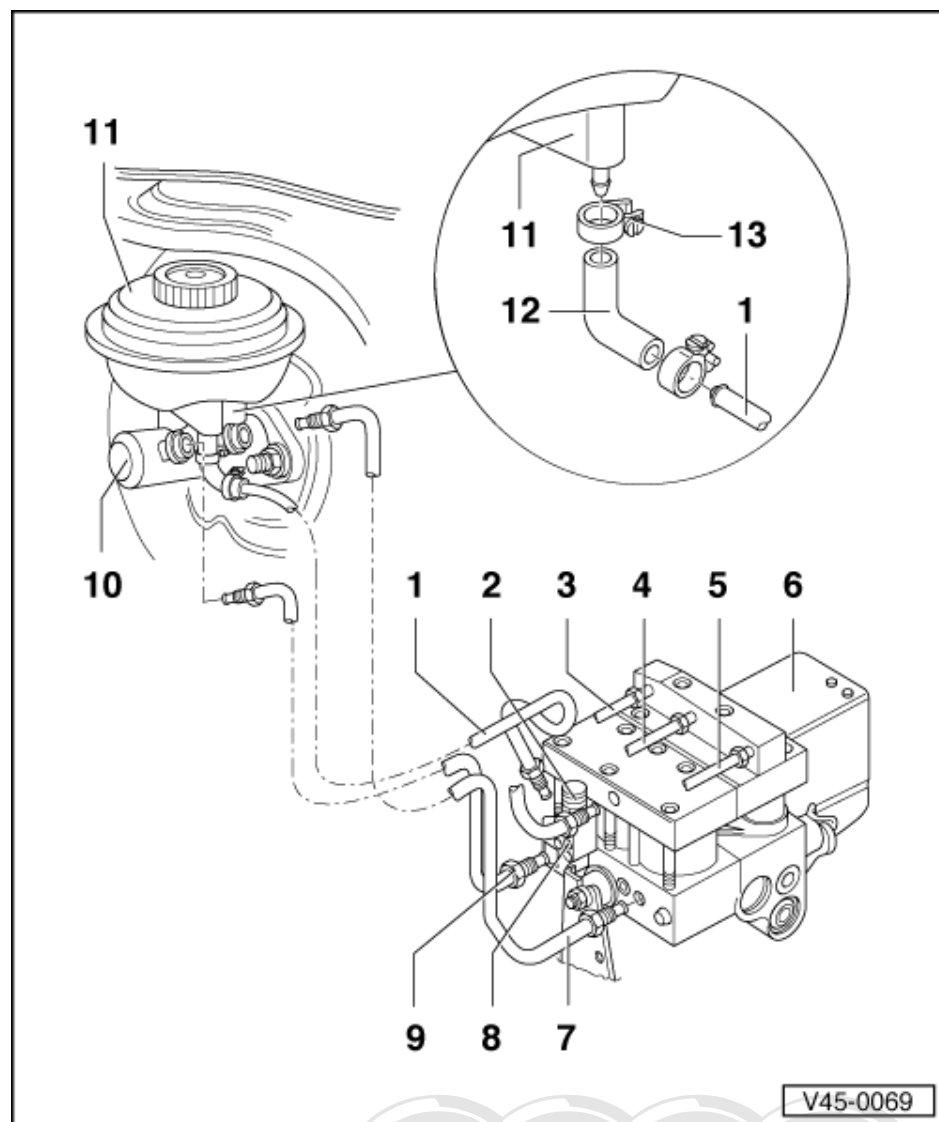
Warning!

The anti-lock brake system is basically maintenance-free.

Testing, assembly and service work is only to be performed by specially trained personnel.

Failure to observe the points described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.

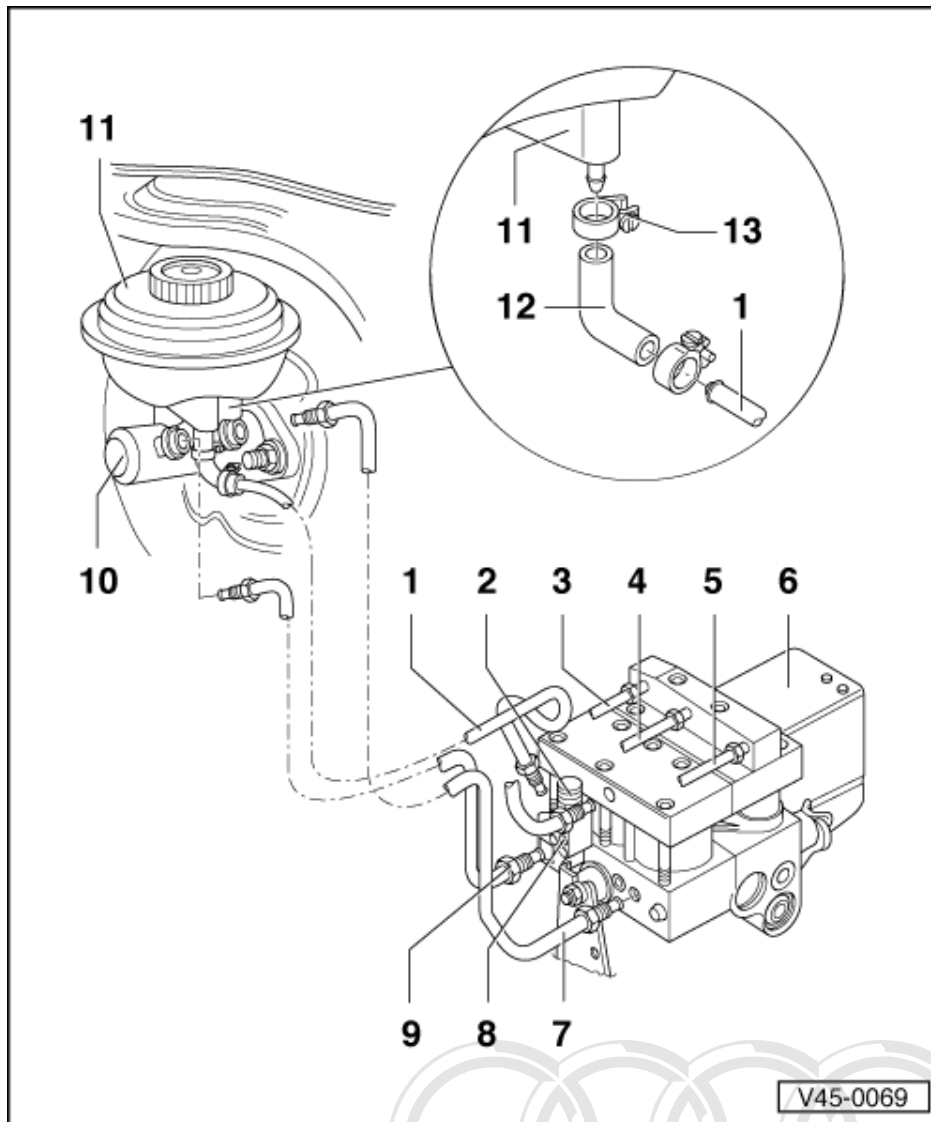
6.2 - Hydraulic unit and brake pipes



The tightening torque of the brake pipe is 15 Nm.

- 1 Suction pipe**
 - ♦ Hydraulic unit to brake fluid reservoir
- 2 Bleed screw**
 - ♦ Open to bleed suction pipe
- 3 Brake pipe**
 - ♦ Hydraulic unit to front left brake caliper
- 4 Brake pipe**
 - ♦ Hydraulic unit to rear right brake caliper

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5 Brake pipe

- ♦ Hydraulic unit to front right brake caliper

6 ABS hydraulic unit

- ♦ No repair work may be carried out on the hydraulic unit, with the exception of replacing both relays .
 Never unfasten bolted joints
- ♦ If necessary, replace hydraulic unit only as a complete assembly
- Carry out high- and low-pressure test => Page 3

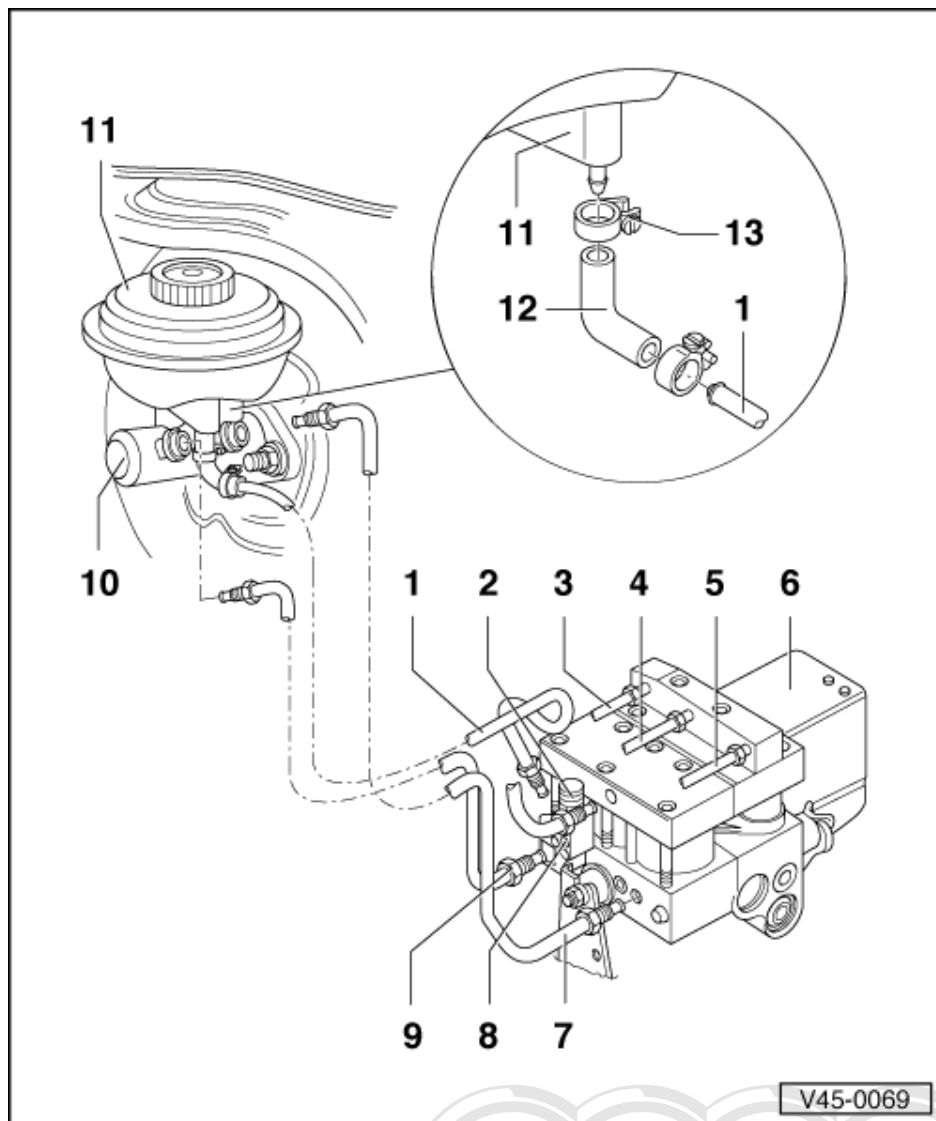
7 Brake pipe

- ♦ Brake master cylinder/push rod piston circuit to hydraulic unit

8 Brake pipe

- ♦ Hydraulic unit to rear left brake caliper

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9 Brake pipe

- ♦ Brake master cylinder/floating piston circuit to hydraulic unit

10 Brake master cylinder

- ♦ $\varnothing$ 23.81 mm

11 Brake fluid reservoir with float-type indicator

- ♦ Fill brake fluid up to "max" mark
- ♦ Connections provided on side for hydraulic clutch controls and EDL-suction pipe
- ♦ Refer to label on reservoir before topping up brake fluid
- ♦ Brake fluid: Total quantity approx. 0.6 l in braking system

12 Angle hose

13 Hose clamp

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7 - Anti-lock brake system (ABS)

7.1 - Anti-lock brake system (ABS)

7.2 - ABS with electronic differential lock (ABS/EDL), ABS/EDL with traction control system (TCS)

Observe safety precautions => Page 2

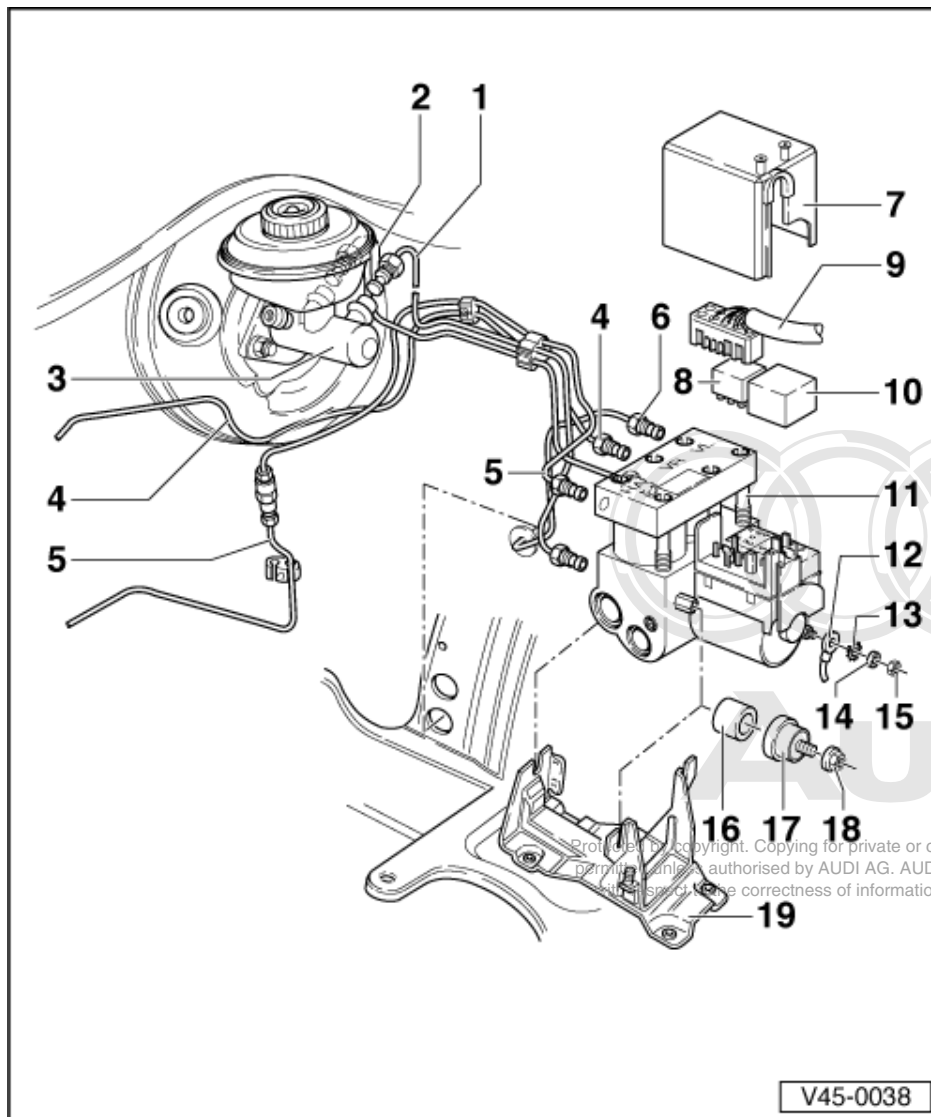
Warning!

The anti-lock brake system is basically maintenance-free.

Testing, assembly and service work is only to be performed by specially trained personnel.

Failure to observe the points described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.

7.3 - Hydraulic unit and brake pipes



The tightening torque of the brake pipe is 15 Nm.

1 Brake pipe

- ♦ Brake master cylinder/floating piston circuit to hydraulic unit

2 Brake pipe

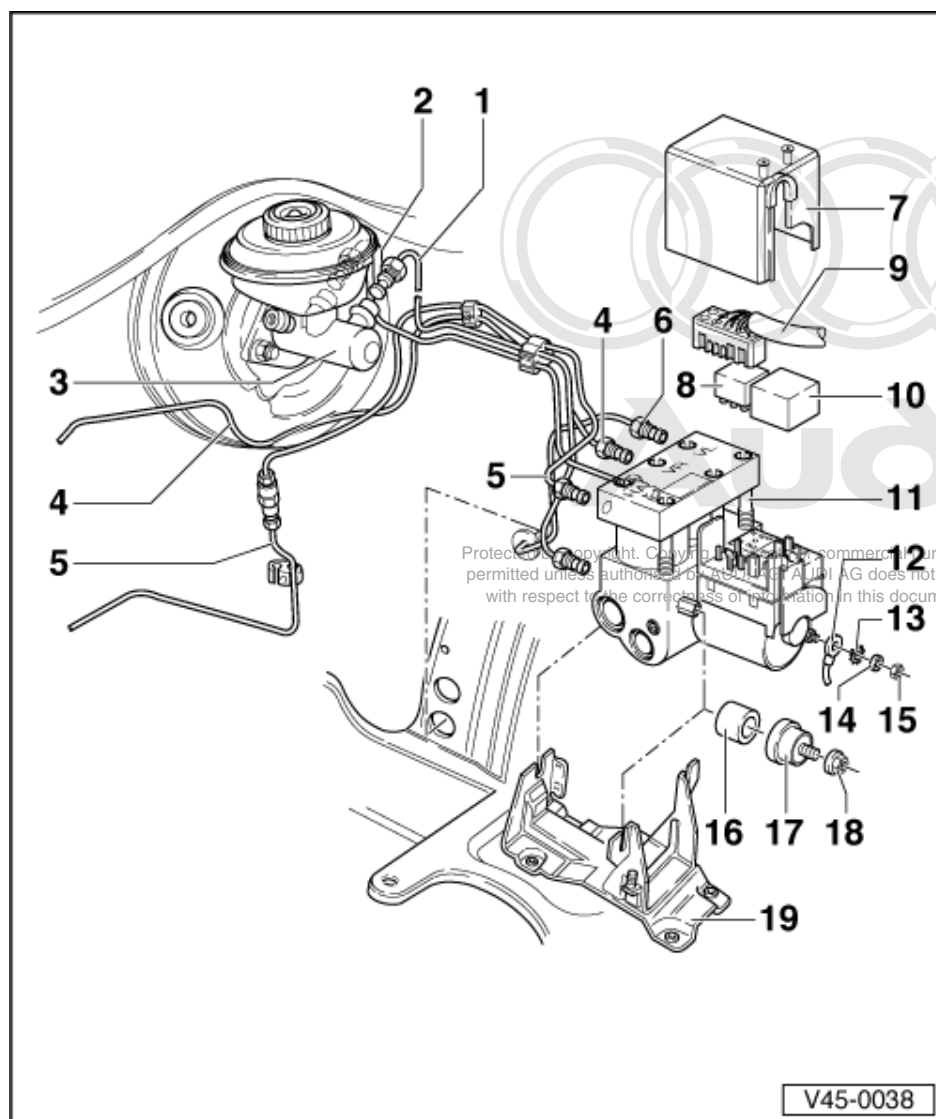
- ♦ Brake master cylinder/push rod piston circuit to hydraulic unit

3 Brake master cylinder and pneumatic brake servo

- ♦ Audi S4/S6- models feature a hydraulic brake servo => Page 137

4 Brake pipe

- ♦ Hydraulic unit to front right brake caliper



5 Brake pipe

- ♦ Hydraulic unit to rear axle

6 Brake pipe

- ♦ Hydraulic unit to front left brake caliper

7 Cover

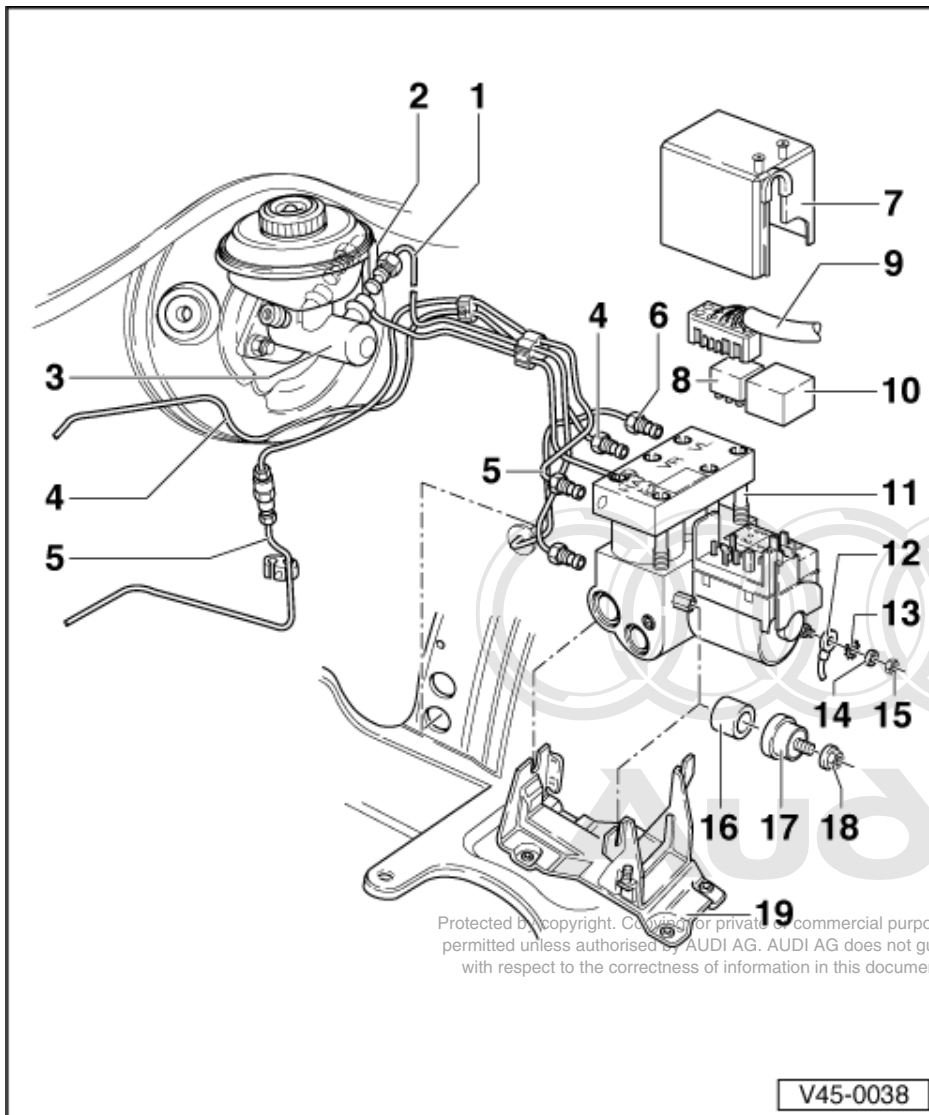
- ♦ Fit carefully and secure
- ♦ Also used for attachment of ABS wiring harness

8 Relay for solenoid valves

- ♦ As of chassis no. PN 039 805, valve relay is provided with an electronic cut-out

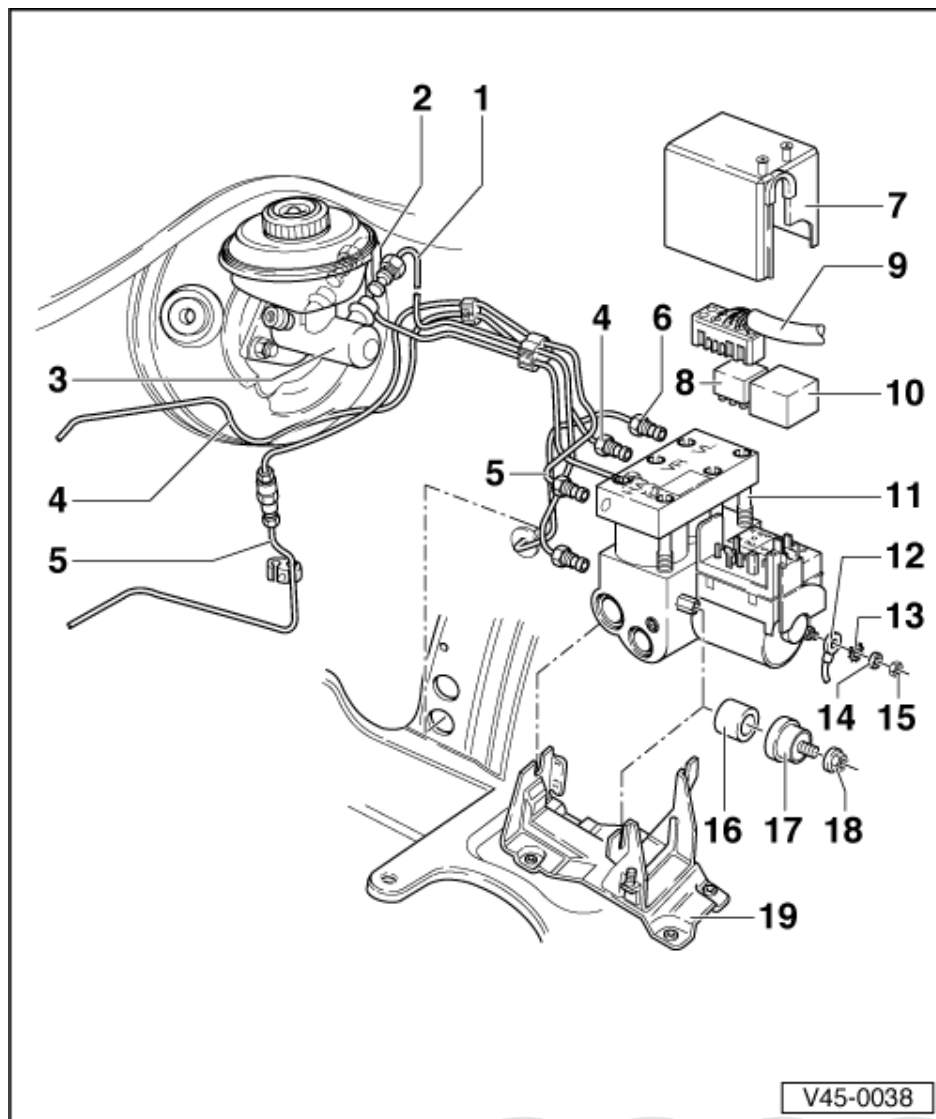
9 ABS-wiring harness

10 Relay for return pump



11 ABS hydraulic unit

- ◆ No repair work may be carried out on the hydraulic unit, with the exception of replacing both relays .
 Never unfasten bolted joints
- ◆ If necessary, replace hydraulic unit only as a complete assembly
- ◆ Replacement hydraulic units are supplied pre-bled
- ◆ Removing and installing the hydraulic unit
 - Disconnect earthing strap from battery
 - Seal the brake lines and connections immediately with dummy plugs



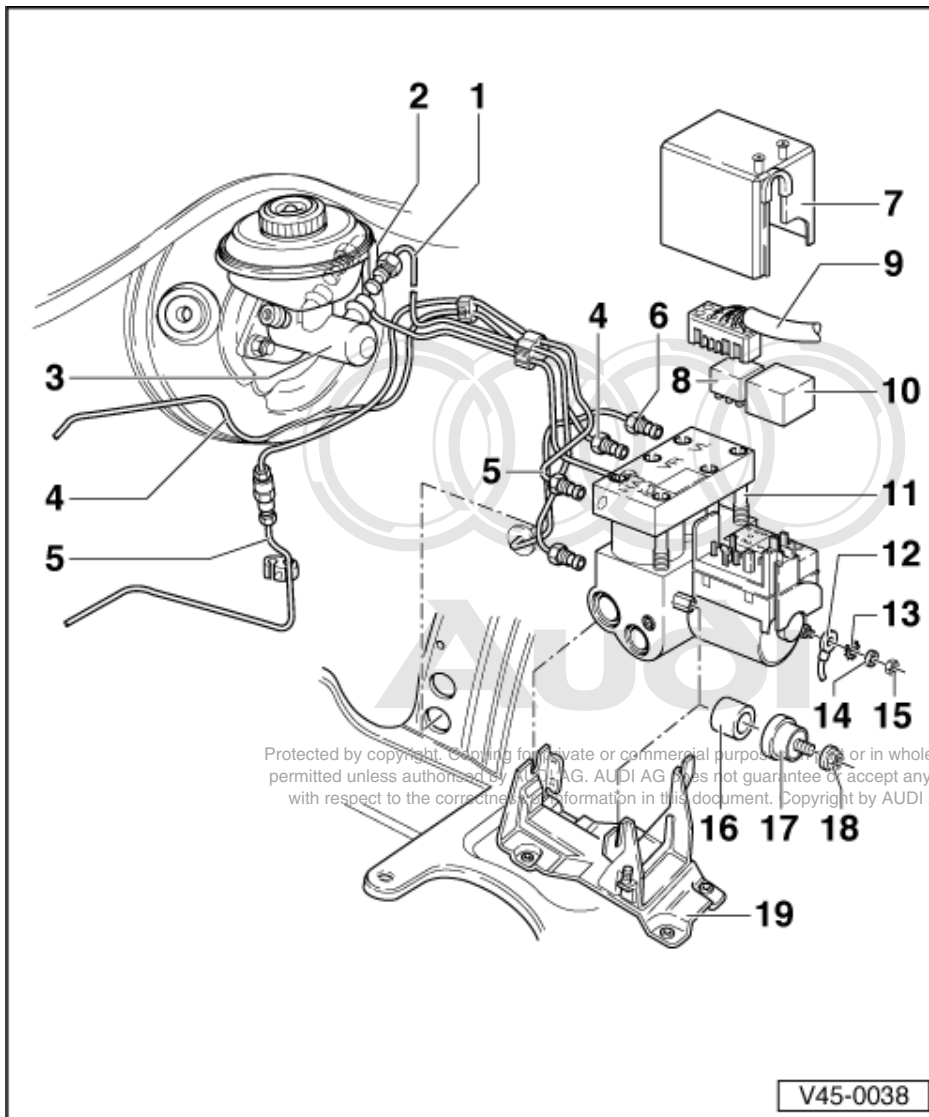
- If the hydraulic unit is replaced, bolt the new hydraulic unit onto the bracket-Item **19** -. Remove the dummy plugs from the brake line connections. The brake lines should be connected in accordance with the designations on the hydraulic unit
- The tightening torque of the brake pipe is 15 Nm.
- Bleed brake system => Page **121**
- Carry out high- and low-pressure test => Page **3**
- Perform electrical test

12 Earth wire

- ◆ Ensure good contact

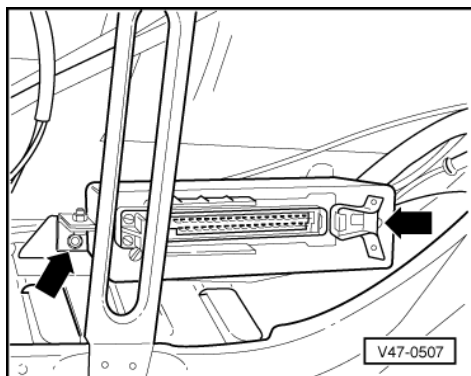


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- 13 Toothed lock washer
- 14 Washer
- 15 Hexagon nut 10 Nm
- 16 Buffer
- 17 Bush
- 18 Self-locking nut, 7 Nm
 - ♦ Renew each time after removing
- 19 Bracket for hydraulic unit

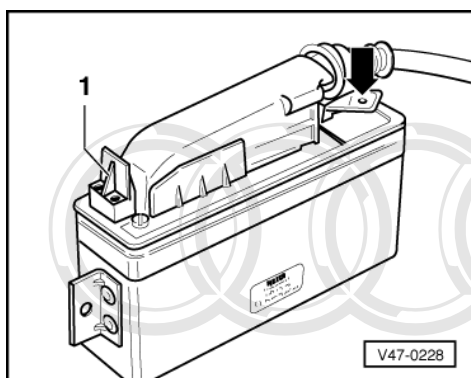
7.4 - Removing and installing control unit for ABS/EDL or TCS



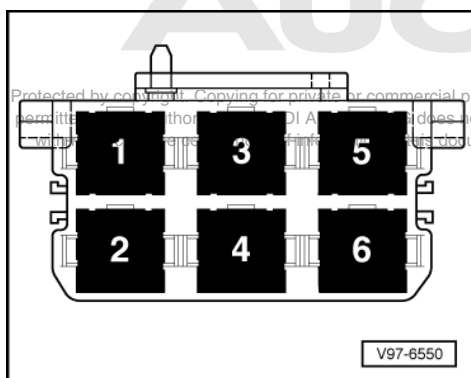
Location:

On left below rear seat

- Switch off ignition.
- Lift rear seat out of its catches.
- -> Remove both retaining bolts -arrows-



- -> Release connector -see arrow- and separate from control unit -J104.



-> Removing and installing combined relay

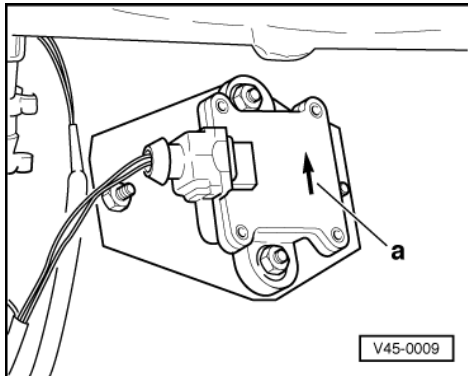
Location:

Behind A-pillar-trim at bottom left in auxiliary relay carrier (6-position), relay position 4

- Remove storage compartment for driver's side.

- Remove A-pillar-trim.

Combined relay was discontinued as of 07.92.



-> Removing and installing longitudinal acceleration switch

Location:

On left below rear seat

- Switch off ignition.
- Lift rear seat out of its catches.
- Arrow -a- indicates direction of travel.

Longitudinal acceleration switch was discontinued as of 07.92.

8 - Bosch 5.0 Anti-lock brake system (ABS) as of MY '95 (chassis no. 4ASN ...)

8.1 - Bosch 5.0 Anti-lock brake system (ABS) as of MY '95 (chassis no. 4ASN ...)

8.2 - ABS with electronic differential lock (ABS/EDL), ABS/EDL with traction control system (TCS)

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Observe safety precautions => Page 2

Warning!

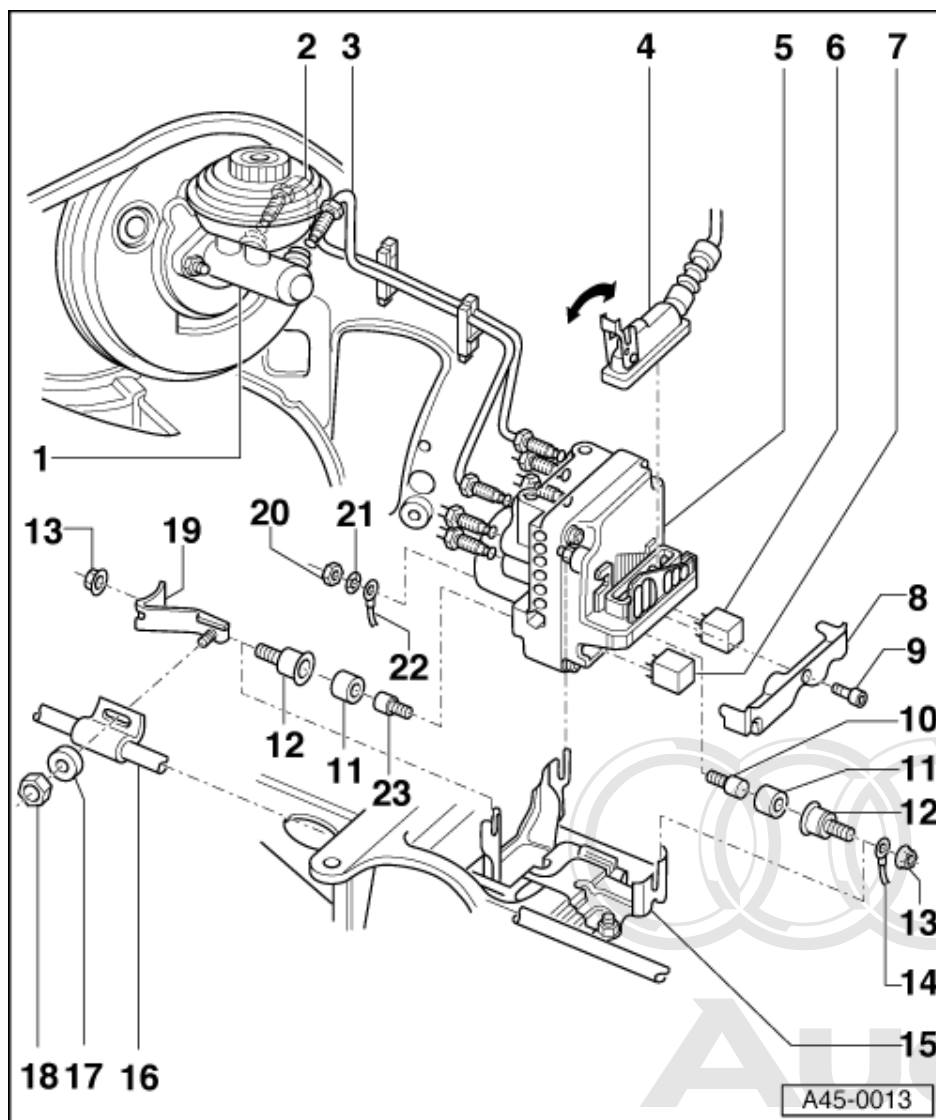
Introduction of the Bosch 5.0 ABS/EDL/TCS was accompanied by modification of the central valves of the master brake cylinder. This cannot be recognised from the external appearance. Using the wrong valves could impair vehicle safety. Observe part no.

The anti-lock brake system is basically maintenance-free.

Testing, assembly and service work is only to be performed by specially trained personnel.

Failure to observe the points described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.

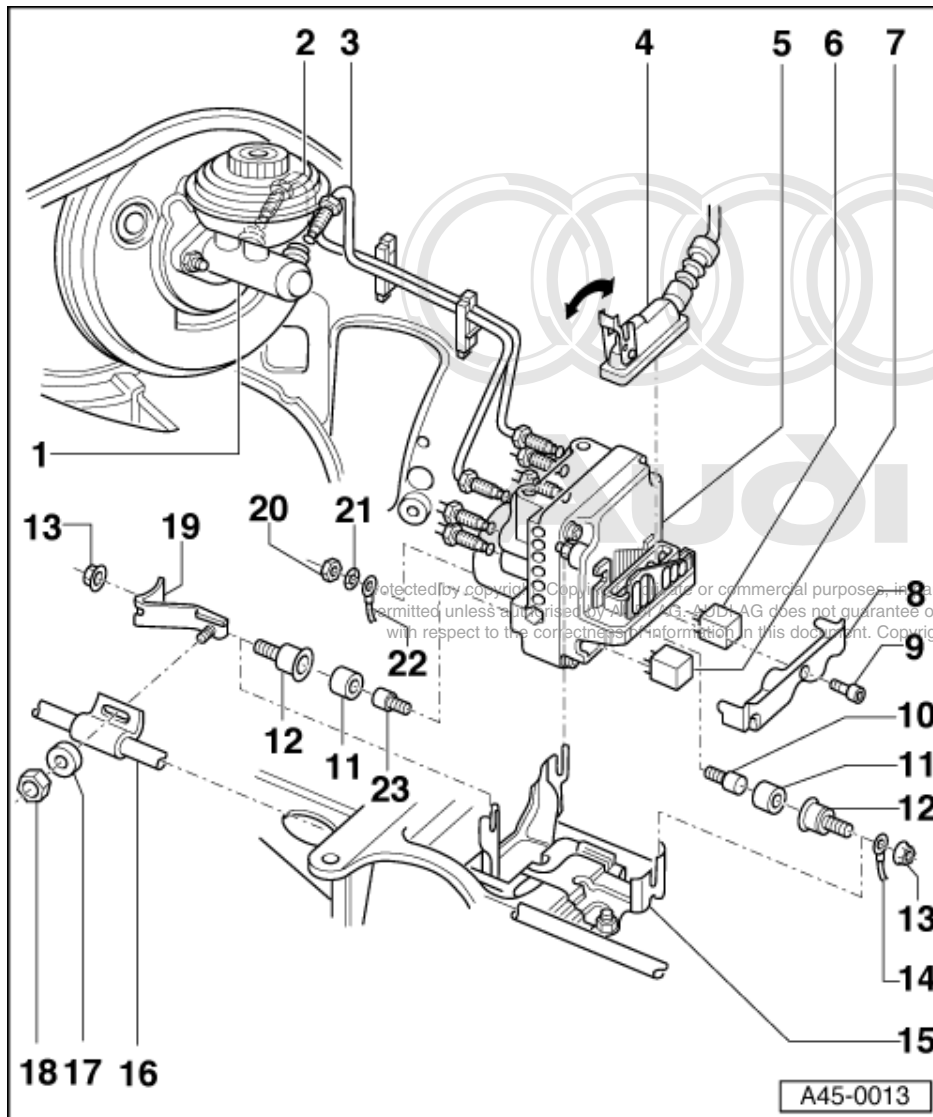
8.3 - Hydraulic unit and brake pipes



The tightening torque of the brake pipe is 15 Nm.

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- 1 Brake master cylinder and brake servo
- 2 Brake pipe
 - ◆ Brake master cylinder/push rod piston circuit to hydraulic unit
 - ◆ Screw connection at brake master cylinder: M12x1
 - ◆ Screw connection at hydraulic unit: M12x1
- 3 Brake pipe
 - ◆ Brake master cylinder/floating piston circuit to hydraulic unit
 - ◆ Screw connection at brake master cylinder: M12x1
 - ◆ Screw connection at hydraulic unit: M12x1

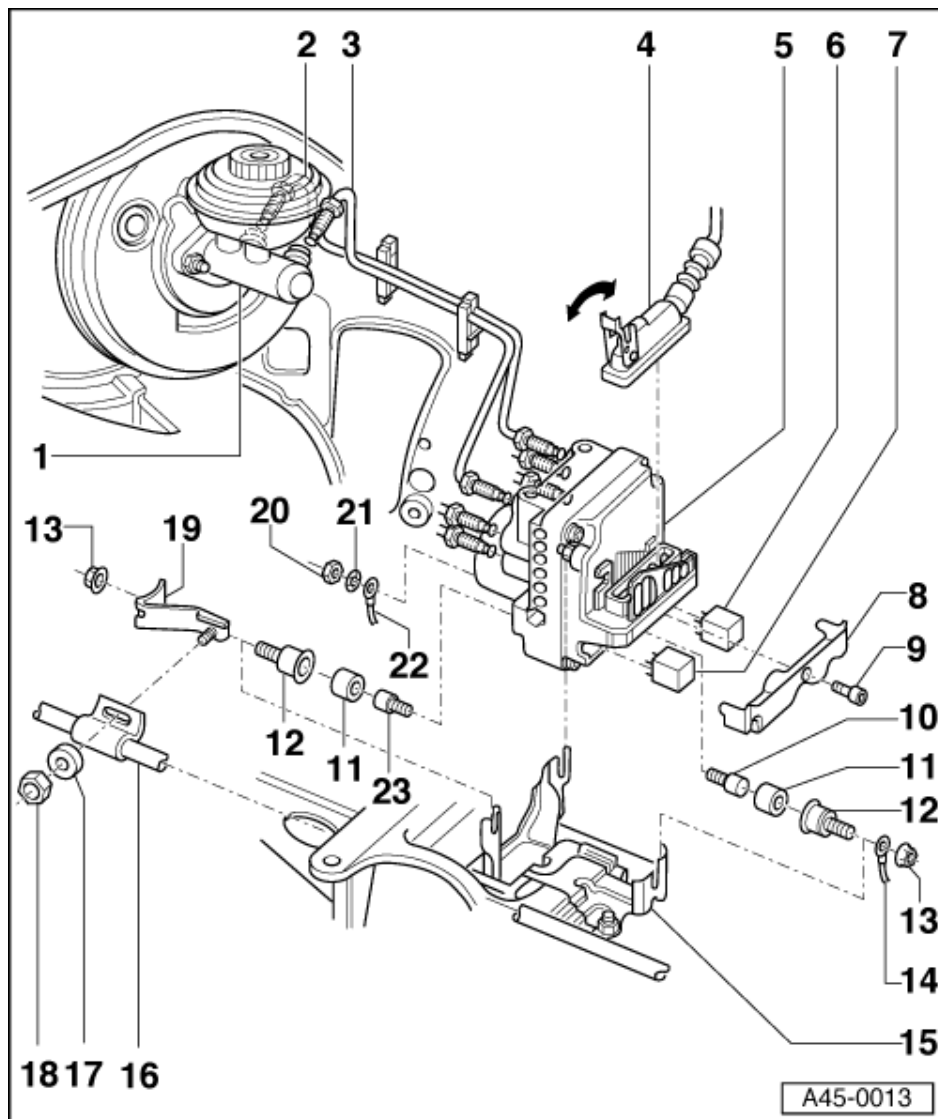


4 Connector, ABS wiring harness

- ◆ Release and detach
- ◆ The connector is part of the ABS wiring harness. Note that there are different versions for FWD and 4WD models.

5 ABS hydraulic unit

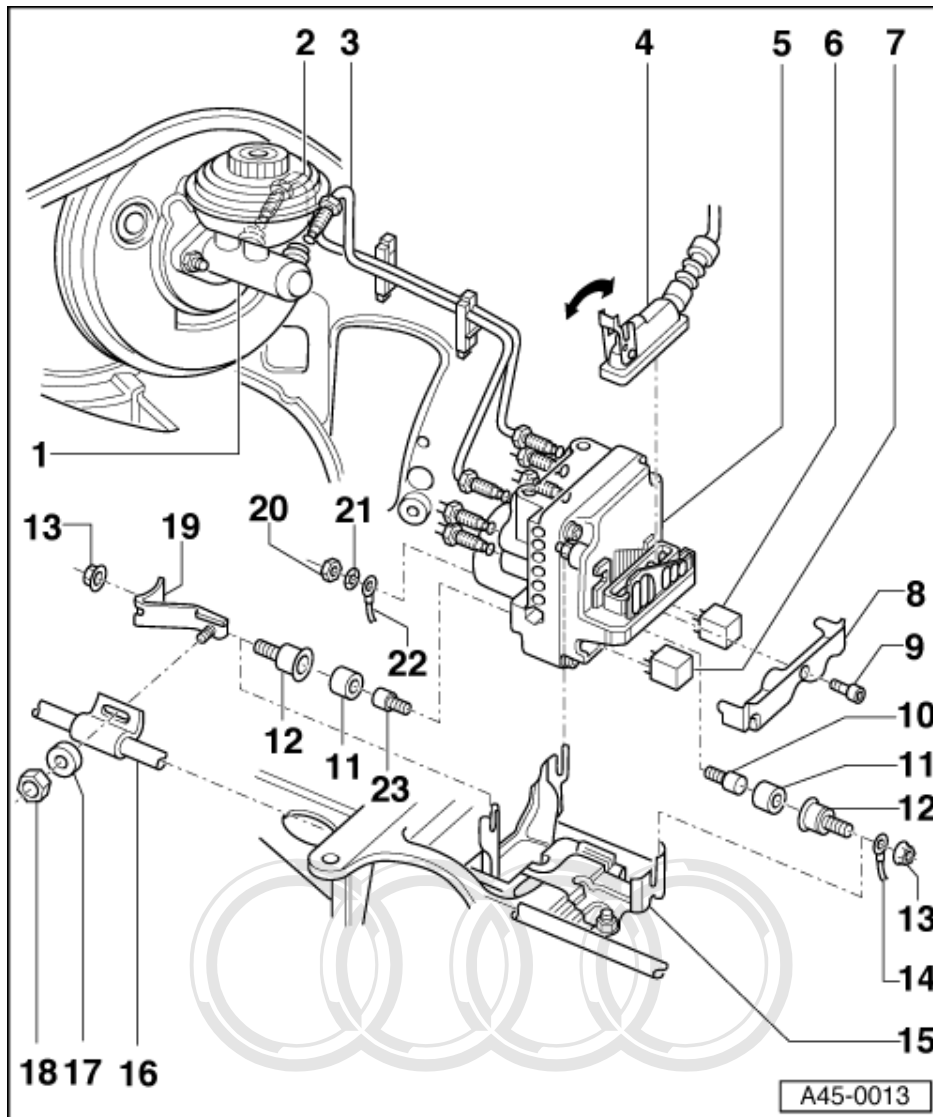
- ◆ Note dissimilar fixing points => Fig. 1, 2 and 3
- ◆ Hydraulic unit/pipe connections/rear => Fig. 1, 2 and 3
- ◆ No repair work may be carried out on the hydraulic unit, with the exception of replacing both relays .
 Never unfasten bolted joints
- ◆ If necessary, replace hydraulic unit only as a complete assembly
- ◆ Replacement hydraulic units are supplied pre-bled



- ♦ Removing and installing the hydraulic unit
- Disconnect earthing strap from battery
- Seal the brake lines and connections immediately with dummy plugs
- If the hydraulic unit is replaced, bolt the new hydraulic unit onto the bracket -Item 15 - -.Remove the dummy plugs from the brake line connections. The brake lines should be connected in accordance with the designations on the hydraulic unit
- The tightening torque of the brake pipe is 15 Nm.
- Bleed brake system => Page 121



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- Carry out high- and low-pressure test => Page 3
- Perform electrical test

- 6 Relay for return pump
- 7 Relay for solenoid valves

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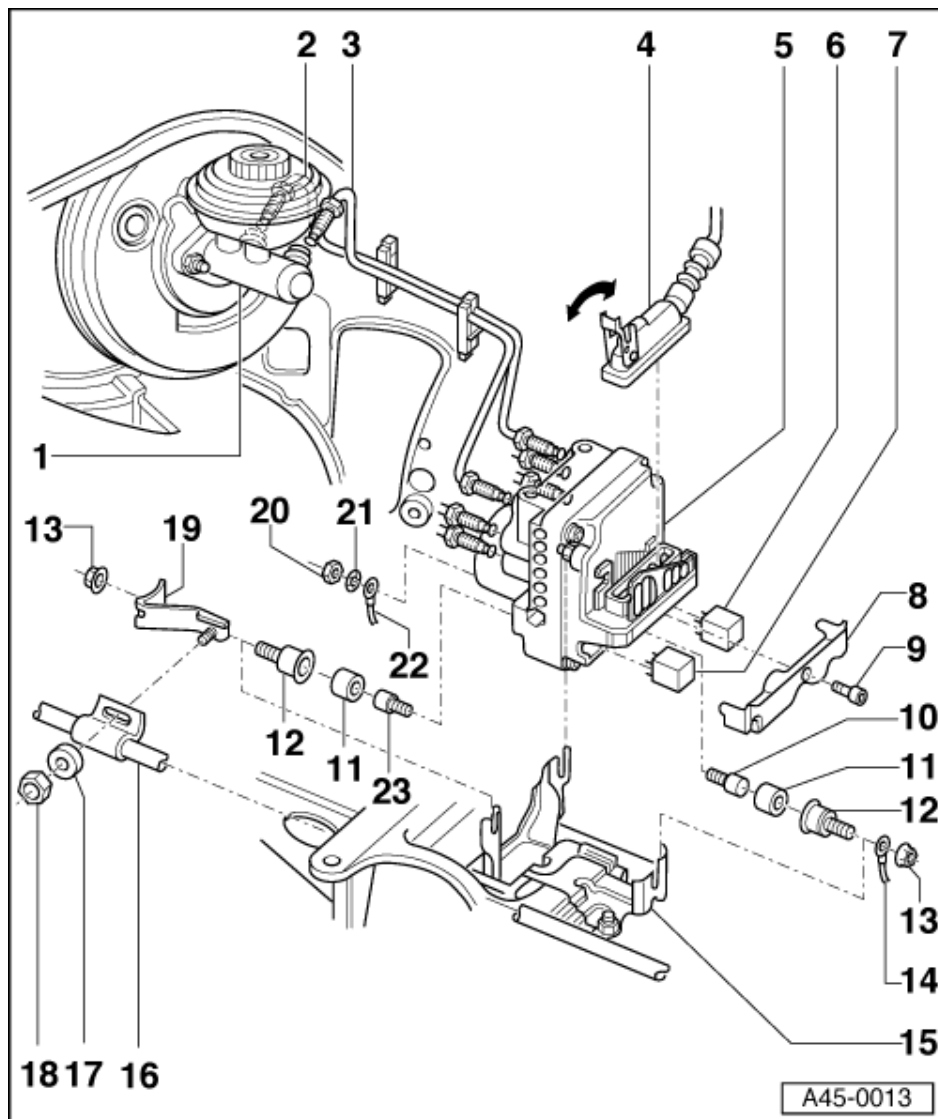
9 Bolt, 5 Nm

10 Stud, 15 Nm

11 Buffer

12 Bush

13 Hexagon nut 15 Nm



14 Earth wire

- ◆ Ensure good contact

15 Bracket for hydraulic unit

Note:

Items - 16 -, - 17 -, - 18 - and - 19 - are only fitted on vehicles with auxiliary heater.

16 Auxiliary heater water pipe

17 Washer

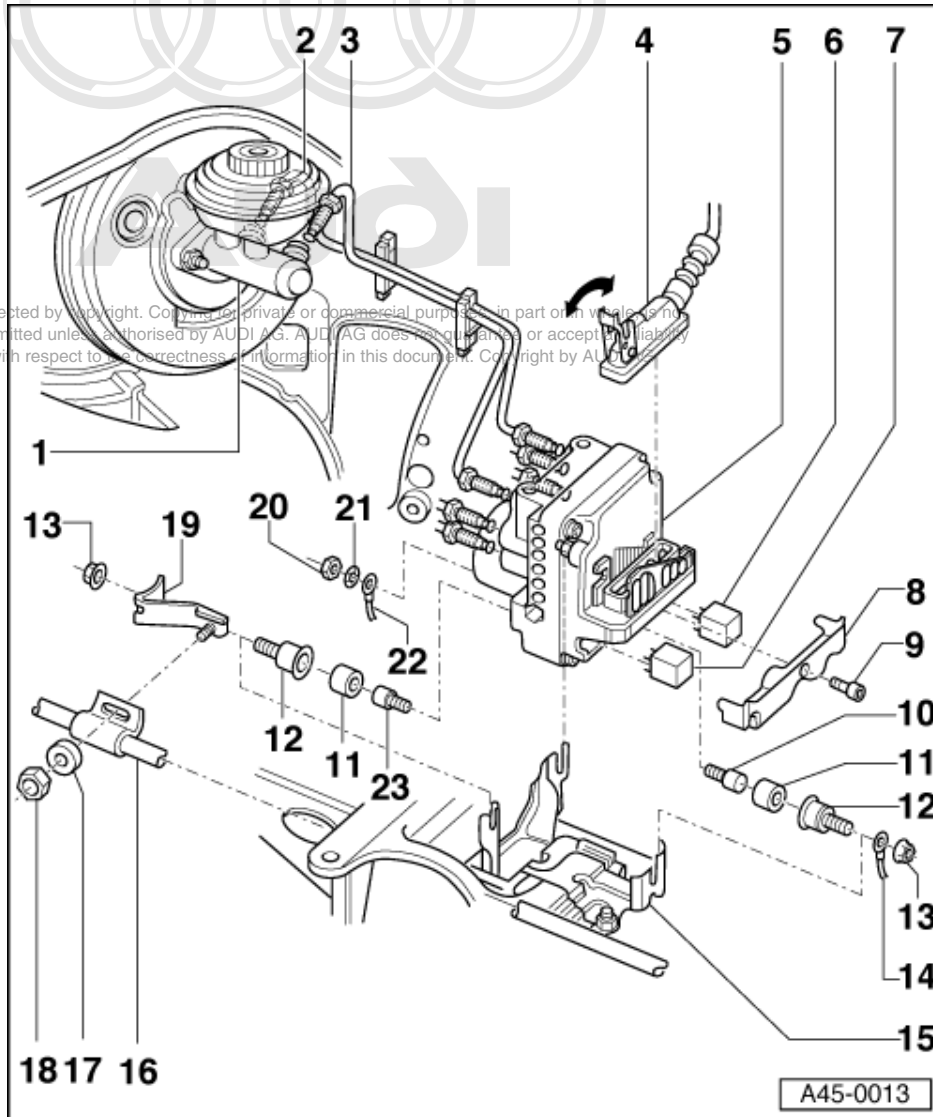
18 Self-locking nut

- ◆ Renew each time after removing

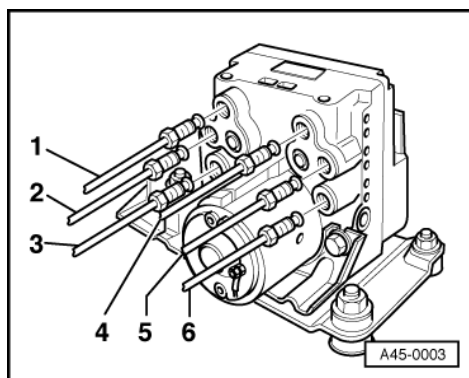
19 Bracket

20 Hexagon nut 10 Nm

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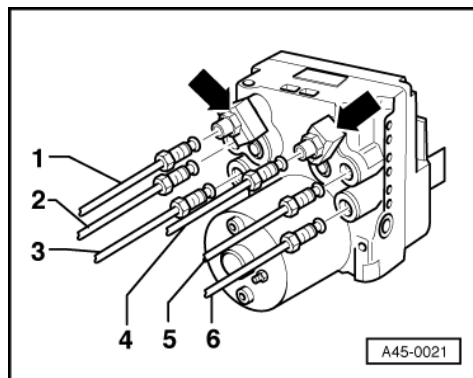


- 21 Toothed lock washer
 22 Earth wire
 ♦ Ensure good contact
 23 Stud, 8 Nm



- > Fig.1 Brake pipe connections at hydraulic unit
 1 - Hydraulic unit - brake master cylinder (push rod piston circuit)
 2 - Hydraulic unit-rear right brake caliper
 3 - Hydraulic unit-front left brake caliper

- 4 - Hydraulic unit-brake master cylinder (floating piston circuit)
- 5 - Hydraulic unit- rear left brake caliper
- 6 - Hydraulic unit- front right brake caliper



-> Fig.2 Brake pipe connections at hydraulic unit, pressure control

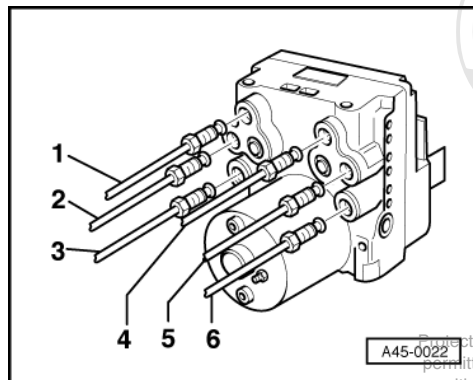
For models with 4WD and ABS/EDL- pressure control (up to 05 95):

Two pressure dampers are screwed into the hydraulic unit -arrows-on vehicles with 4WD and EDL pressure control.

The dampers are designed to smooth pressure peaks in the brake pipes and reduce control noises.

Counterhold at the hexagon of the pressure dampers when unfastening the brake pipes.

- 1 - Hydraulic unit-brake master cylinder (push rod piston circuit)
- 2 - Hydraulic unit-rear right brake caliper
- 3 - Hydraulic unit-front left brake caliper
- 4 - Hydraulic unit-brake master cylinder (floating piston circuit)
- 5 - Hydraulic unit- rear left brake caliper
- 6 - Hydraulic unit- front right brake caliper



-> Fig.3 Hydraulic unit for ABS/EDL-4WD, suction control.

The pressure dampers are not fitted to vehicles with 4WD and EDL suction control (05.95 onwards) => Fig. 2

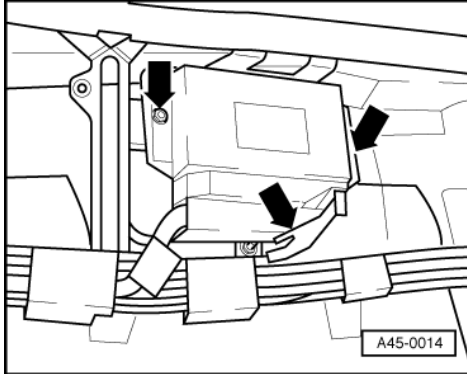
The EDL suction control minimises control noises.

The working range of the pressure limiting valve in the hydraulic unit is raised from 90±25 bar to 170±25 bar.

- 1 - Hydraulic unit-brake master cylinder (push rod piston circuit)
- 2 - Hydraulic unit-rear right brake caliper
- 3 - Hydraulic unit -front left brake caliper
- 4 - Hydraulic unit-brake master cylinder (floating piston circuit)

- 5 - Hydraulic unit rear left brake caliper:
- 6 - Hydraulic unit- front right brake caliper:

8.4 - Removing and installing control unit for ABS/EDL or TCS



Location:

On left below rear seat

- Switch off ignition.
- Lift rear seat out of its catches.
- -> Release connector -lower arrow- and separate from control unit -J104.
- Remove both retaining bolts -upper arrows-

Install in reverse order

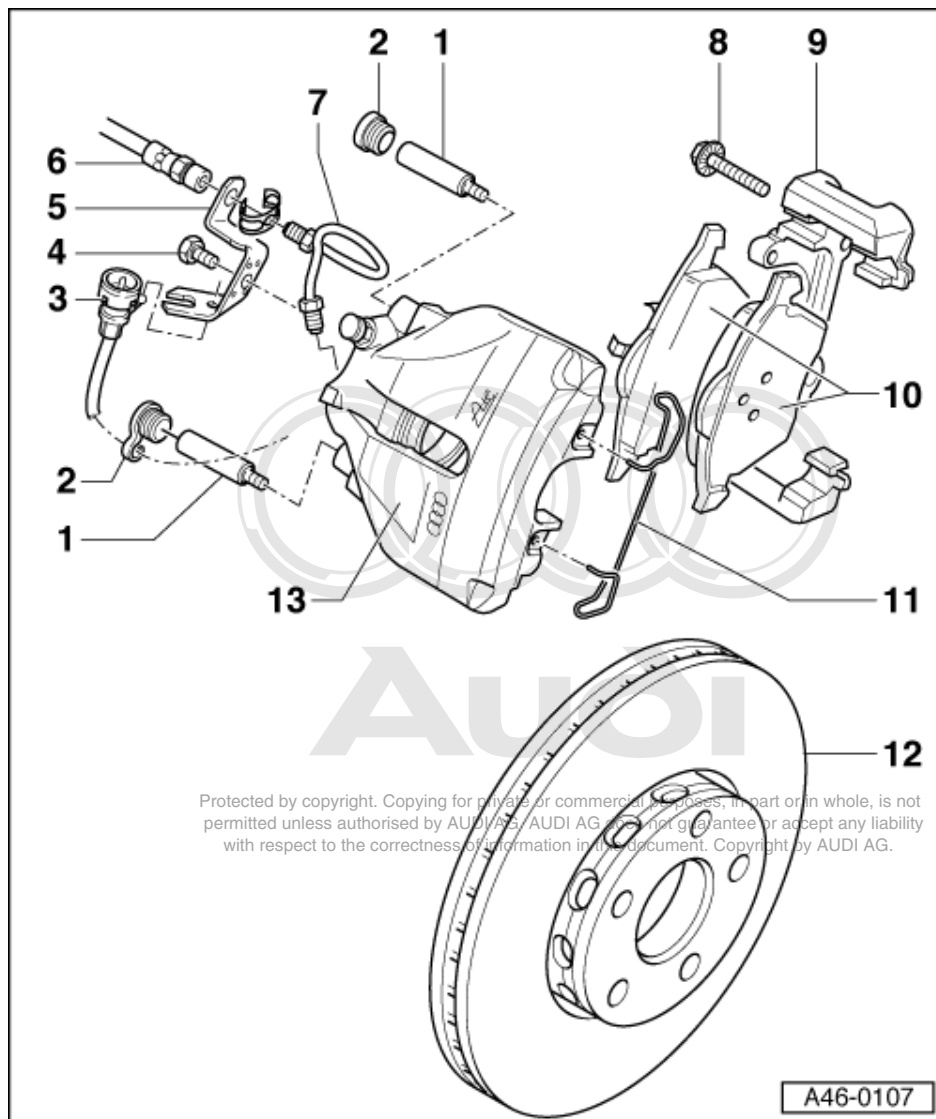


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46 - Brakes, Brake mechanics

1 - Servicing front brakes

1.1 - Servicing front brakes

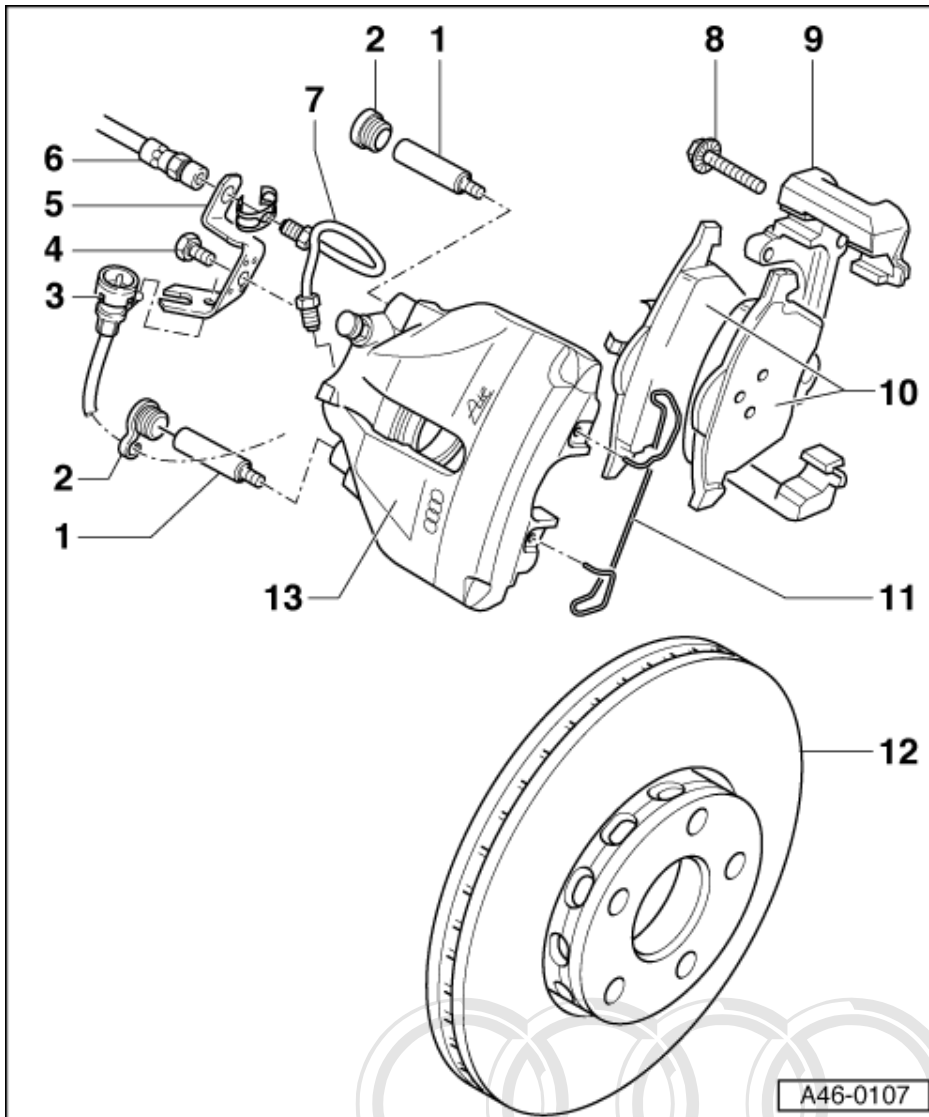


1.2 - Servicing Teves/Ate front brakes

Note:

- ♦ Always install the complete repair kit.
- ♦ After replacing brake pads, depress brake pedal firmly several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.

- ♦ To draw off brake fluid from the reservoir, use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must on no account be sucked out by mouth using a hose!



- ♦ Brakes can be checked on all commercially available brake test stands, provided that the driving speed of the two driving rollers of the test stand does not exceed 5.5 km/h.
- ♦ The tightening torque of the brake pipe is 15 Nm.

1 Guide pin, 25 Nm

2 Trim cap

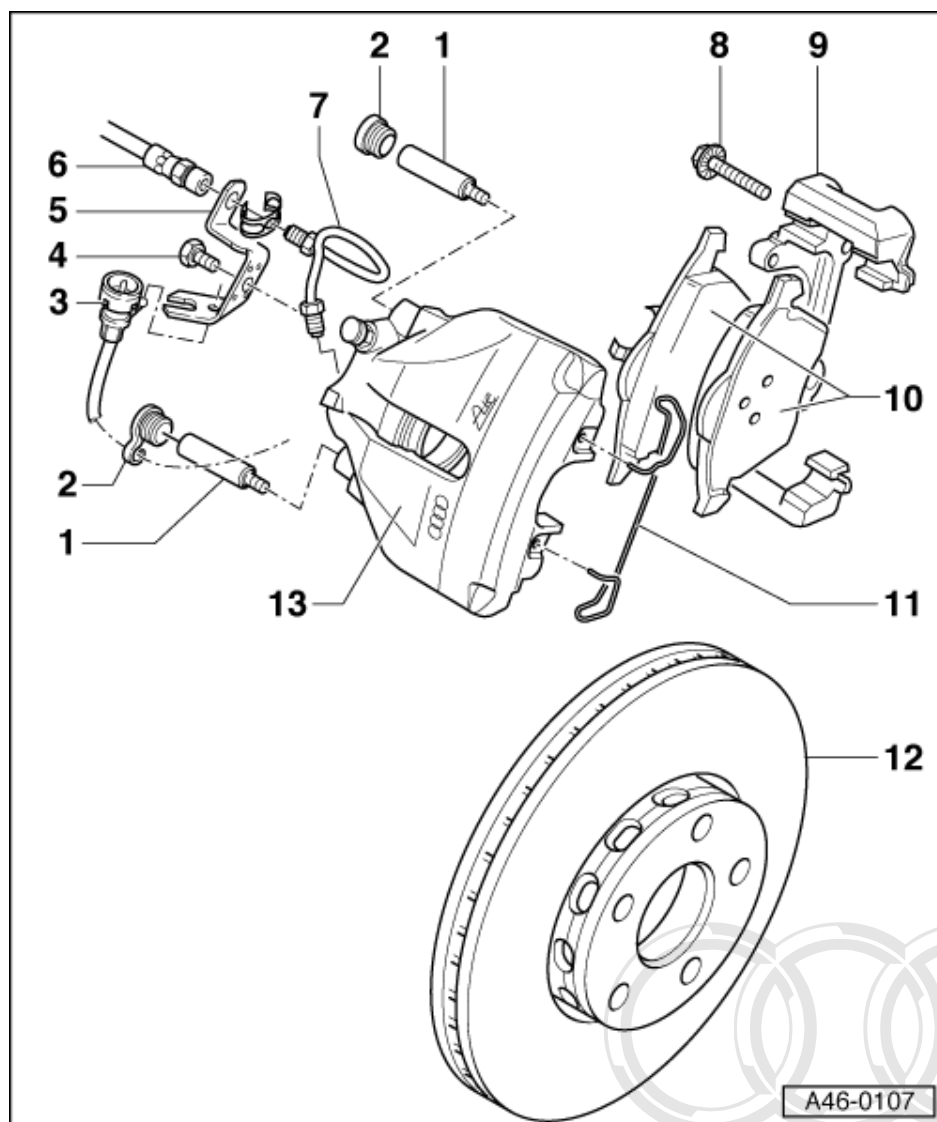
- ♦ Take off
- ♦ With hook at bottom for routing wiring of brake pad wear indicator

3 Connector

- ♦ Take out of bracket at brake caliper on brake pad replacement

4 Hexagon bolt, 25 Nm

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5 Bracket

- ◆ Bolt to brake caliper housing
- ◆ Insert connector for brake pad wear indicator

6 Brake hose

- ◆ Do not disconnect brake hose when changing brake pads

7 Brake pipe, 15 Nm

- ◆ Screw into brake caliper housing
- ◆ Screw into brake hose, counterholding at hexagon on brake hose.

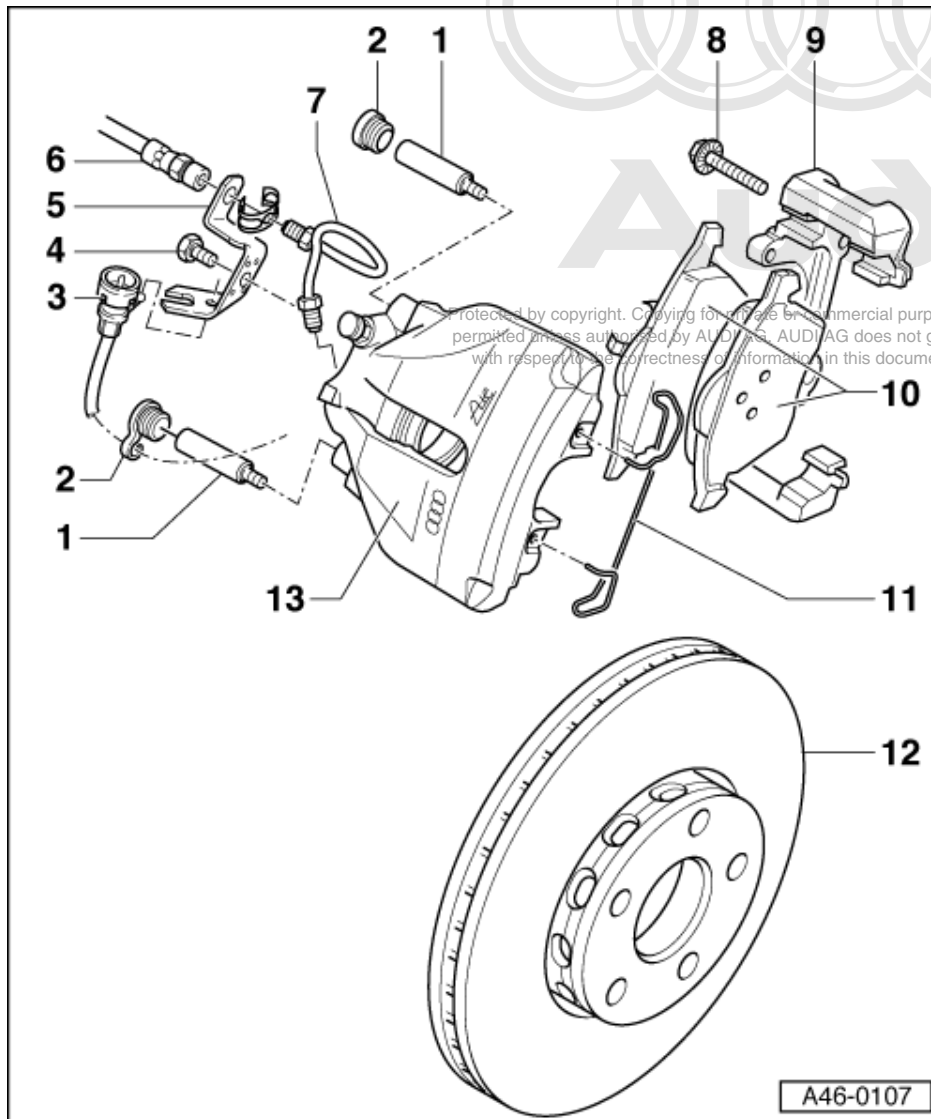
8 Ribbed bolt, 125 Nm

- ◆ Clean ribbings if reusing

9 Brake backplate

- ◆ Bolt to wheel bearing housing

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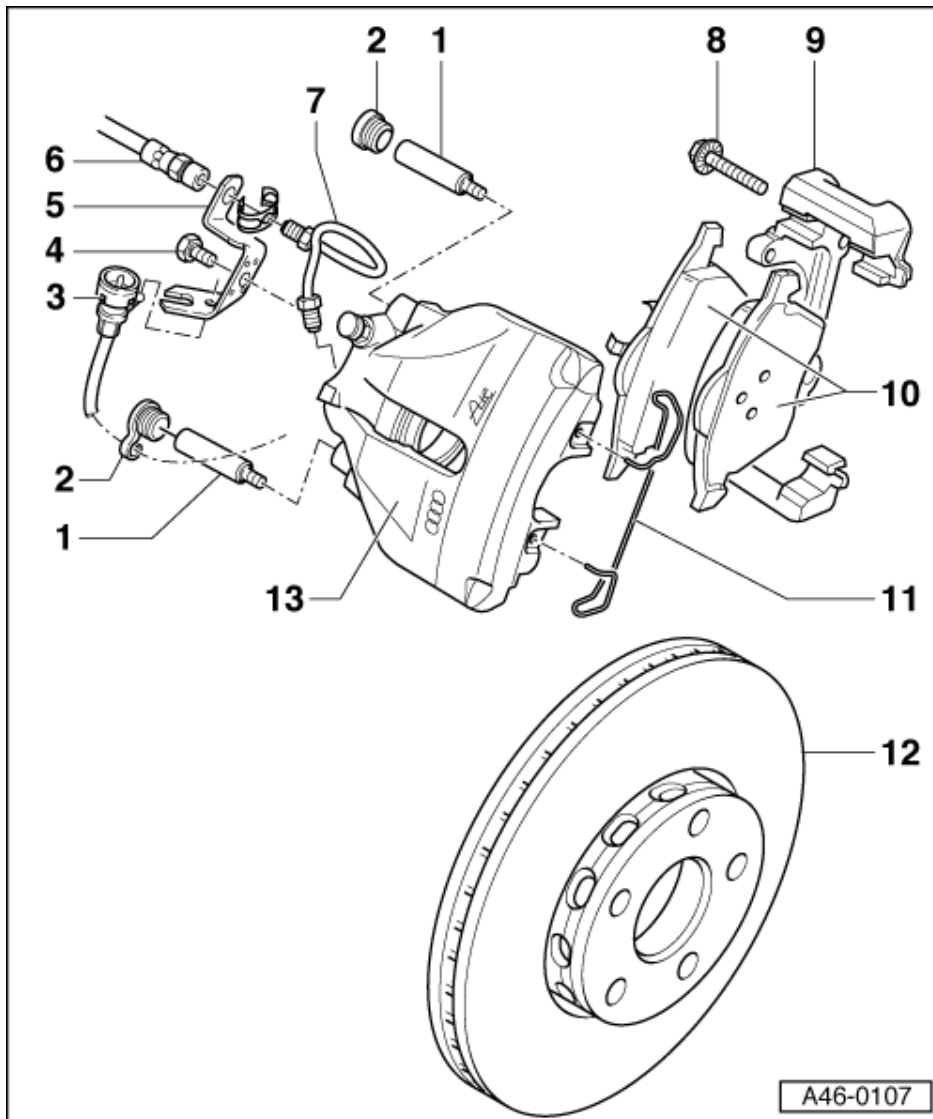
10 Brake pads

- ♦ Always replace on both sides of the car
- ♦ With wear indicator
- Once wear limit is reached, warning light in dash panel insert comes on
- ♦ The outer brake pads are provided with an adhesive sheet on the backing plate of the pad. Remove the protective sheet before inserting pads.
- ♦ Thickness 14 mm
- ♦ check thickness

=> Audi 100 1991; Maintenance

- ♦ Wear limit: 7 mm (including backplate)
- ♦ Removing and installing => Page 46

Always clean the brake calipers (no grease) before inserting new brake pads. Make sure that all adhesive sheet residue on the contact surfaces of the outer brake pad is removed.

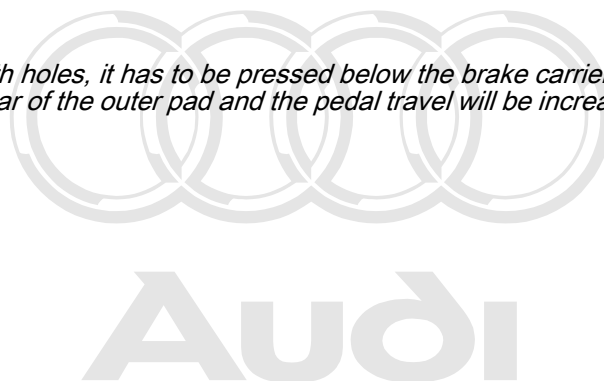


11 Retention spring

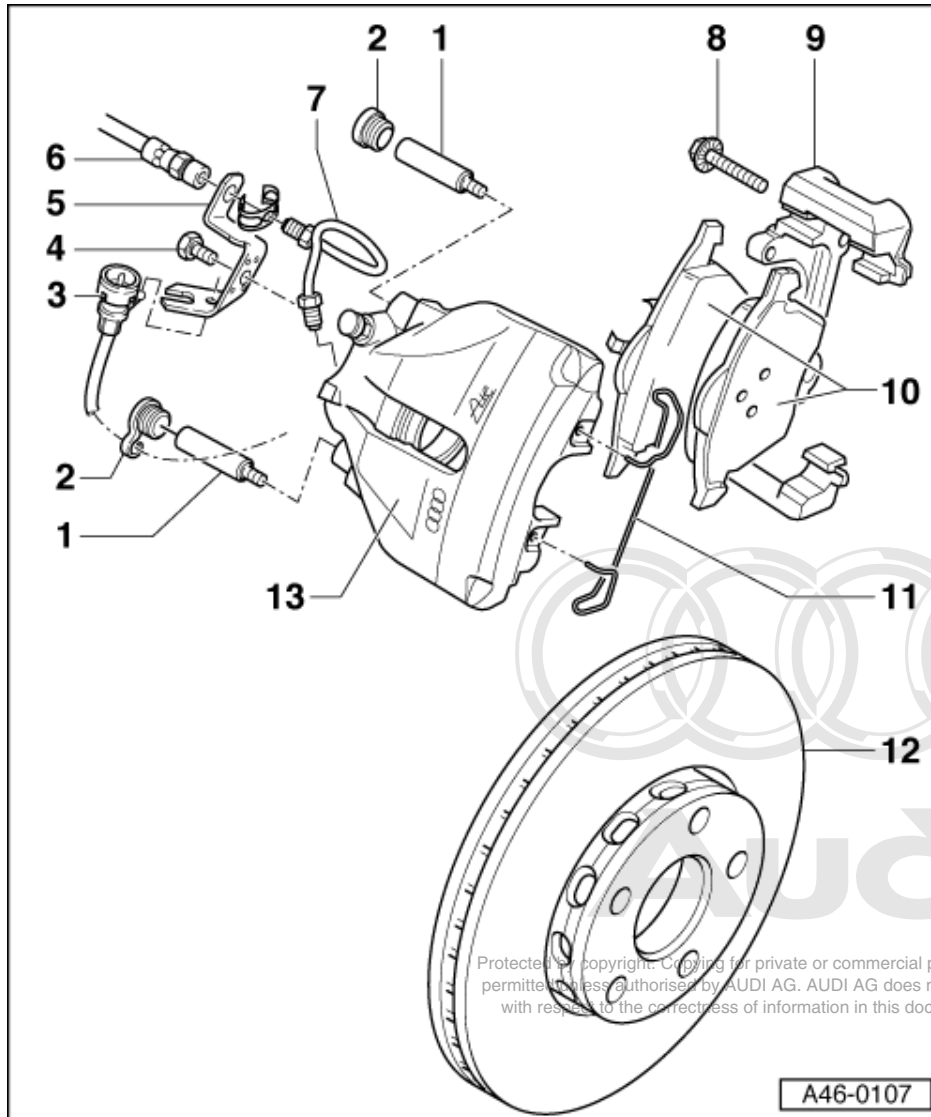
- ◆ Insert into both holes of the brake caliper housing

Note:

After inserting the retaining spring into both holes, it has to be pressed below the brake carrier. If incorrectly installed, it is not possible to adjust the wear of the outer pad and the pedal travel will be increased as a result.



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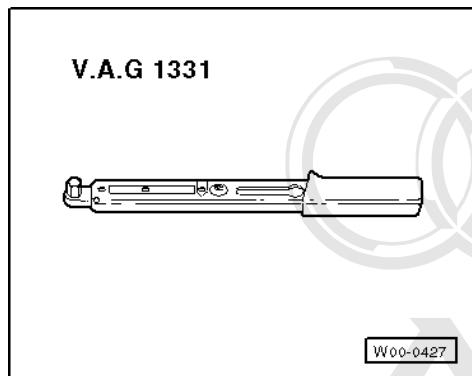
12 Brake disc

- ◆ Always replace on both sides of the car
- ◆ Remove brake caliper prior to removing
- ◆ Always dress evenly, on both sides, starting from thickness when new
- ◆ Internally ventilated brake disc: $\varnothing$ 288 mm
- ◆ Brake disc thickness: 25 mm
- ◆ Wear limit: 23 mm
- ◆ Non-ventilated brake disc: $\varnothing$ 288 mm
- ◆ Brake disc thickness: 15 mm
- ◆ Wear limit: 13 mm

13 Brake caliper housing

- ◆ Unscrew from brake carrier to replace brake pads
- ◆ Servicing brake calipers => Page 99

1.3 - Removing and installing brake pads



Special tools and workshop equipment required

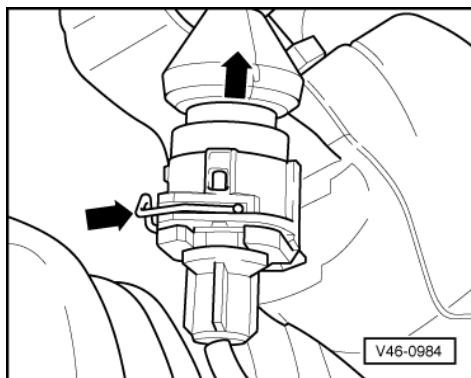
- ♦ V.A.G 1331 Torque wrench
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Removing

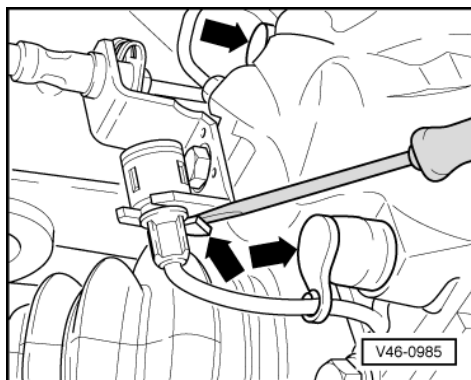
Note:

Mark brake pads to be reused on removal. Reinstall in their original position to prevent uneven braking!

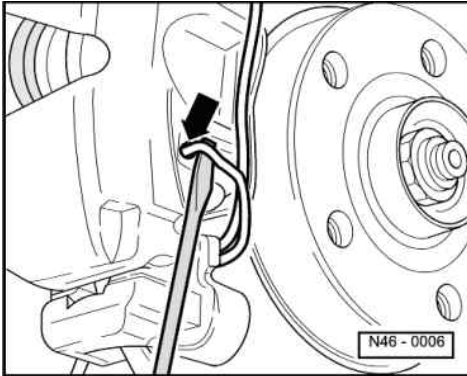
- Jack up vehicle.



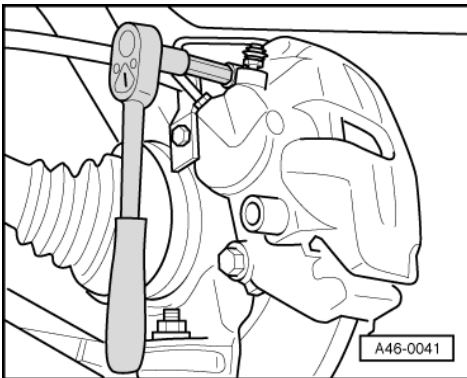
- Remove wheel.
- -> Detach connector; to do so, press spring -left arrow- and pull off plug.



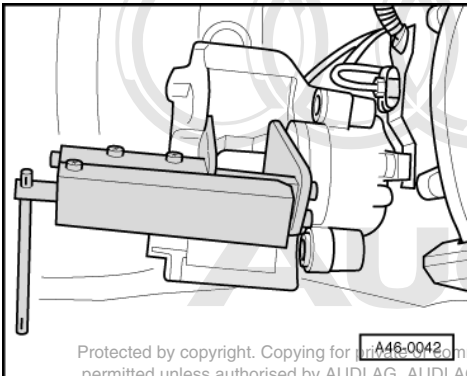
- -> Use screwdriver to carefully lift tab slightly on bottom part of plug, then turn through 90° anti-clockwise or clockwise and remove from bracket.
- Pull wire for brake-pad wear indicator out of cap.
- Remove protective caps.



- -> Lever off brake pad retaining spring from brake caliper housing with a screwdriver and remove.



- -> Unscrew both guide pins and remove from brake caliper.
- Take off the brake caliper housing and lay to one side so that the weight of the brake caliper does not pull on or damage the brake hose.
- Take brake pad out of brake caliper housing or from brake carrier.



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Installing

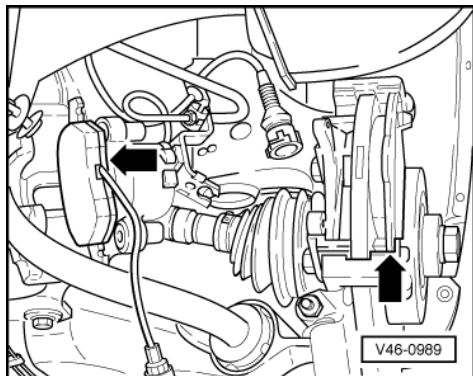
- -> Pressing piston back.

Note:

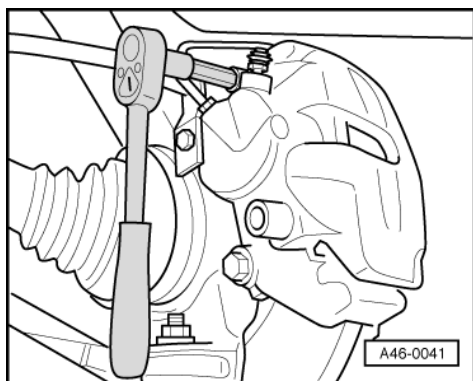
Before inserting new brake pads, press piston back into the cylinder with resetting tool. Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise brake fluid - which was used to top up the brake fluid reservoir-, may run out and cause damage.

Warning!

Brake fluid is poisonous and must on no account be siphoned orally through a hose.



- -> Insert brake pad with wire for wear indicator in brake caliper housing.
- Pull off protective sheet on backing plate of outer brake pad.
- Fit outer brake pad to brake carrier.



- -> Secure brake caliper housing to brake carrier with both guide pins to 25 Nm.
- Insert bottom part of plug of brake pad wear indicator in bracket at brake caliper.
- Fit both protective caps.
- Position wire for brake-pad wear indicator in cap.
- Connect connector.
- Insert retaining spring into brake caliper housing.

Note:

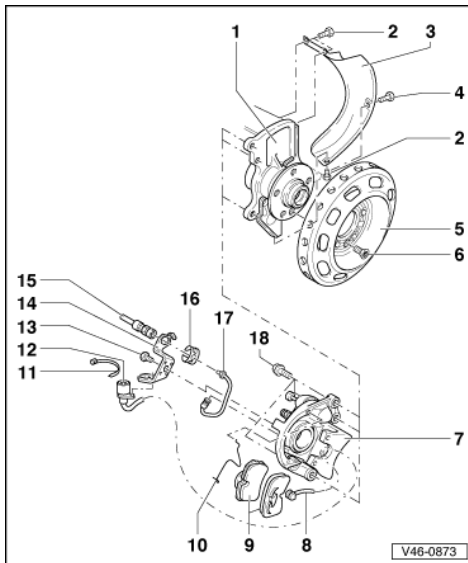
- ♦ After inserting the retaining spring into both holes, it has to be pressed below the brake carrier. If incorrectly installed, it is not possible to adjust the wear of the outer pad and the pedal travel will be increased as a result.

After replacing the brake pads, depress brake pedal firmly several times with the vehicle stationary, so that the brake pads are properly seated in their normal operating position.

- Check brake fluid level and top up if necessary.

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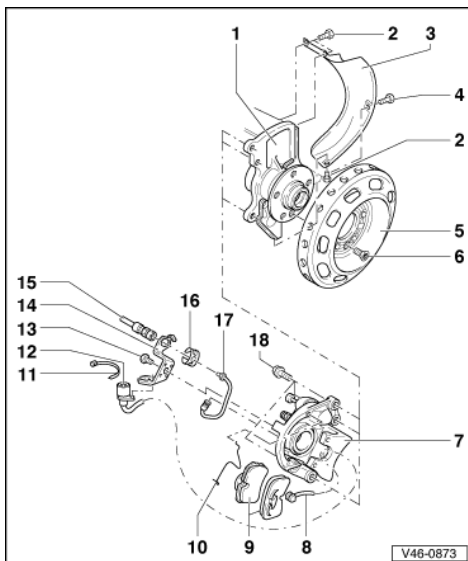
1.4 - Servicing front brake, internal caliper disc brake



Audi S4

Note:

- ◆ Always install the complete repair kit.
- ◆ After replacing brake pads, depress brake pedal firmly several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.
- ◆ To draw off brake fluid from the reservoir, use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must on no account be sucked out by mouth using a hose!



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- ◆ Brakes can be checked on all commercially available brake test stands, provided that the driving speed of the two driving rollers of the test stand does not exceed 5.5 km/h.
- ◆ The tightening torque of the brake pipe is 15 Nm.

1 Wheel bearing housing

2 Hexagon bolt, 5 Nm

3 Cover plate

4 Hexagon bolt, 10 Nm

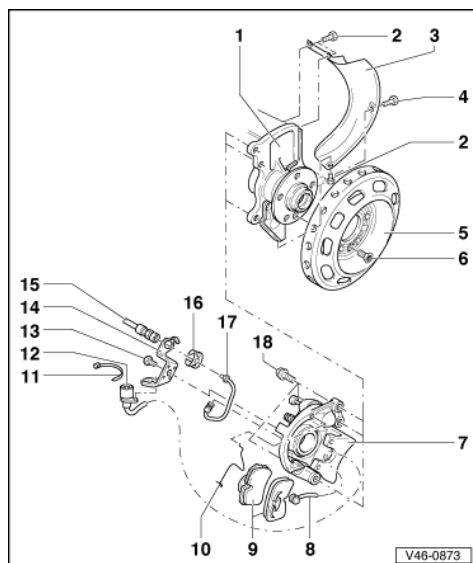
5 Brake disc

- ◆ Always replace on both sides of the car
- ◆ Internally ventilated brake disc: $\varnothing$ 310/312 mm



- ◆ Brake disc thickness: 25 mm
- ◆ Wear limit: 23 mm

6 Bolt, 4 Nm



7 Brake caliper housing

- ◆ Servicing is not envisaged
- ◆ Only replace as complete unit

8 Wire for brake pad wear indicator

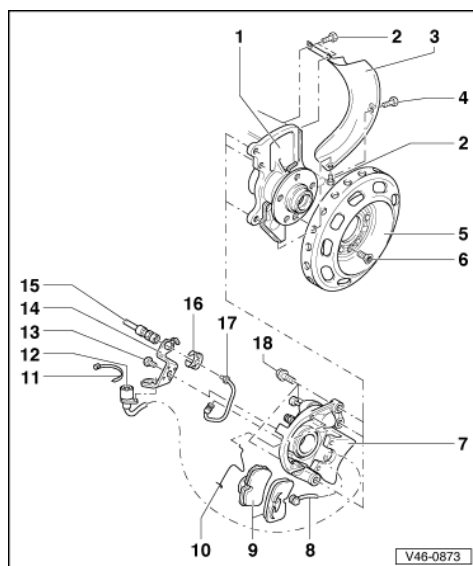
9 Brake pads

- ◆ always replace on both sides of the car
- ◆ with wear indicator
- Once wear limit is reached, warning light in dash panel insert comes on.
- ◆ The outer brake pads are provided with an adhesive sheet on the backing plate of the pad. Remove the protective sheet before inserting pads.
- ◆ Thickness 12 mm
- ◆ check thickness

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=> Audi 100 1991; Maintenance

- ◆ Wear limit: 7 mm including backplate
- ◆ Removing and installing => Page 52



Note:

Always clean the brake calipers (no grease) before inserting new brake pads. Make sure that all adhesive sheet residue on the contact surfaces of the outer brake pad is removed.

10 Pad retaining spring

- ♦ Replace

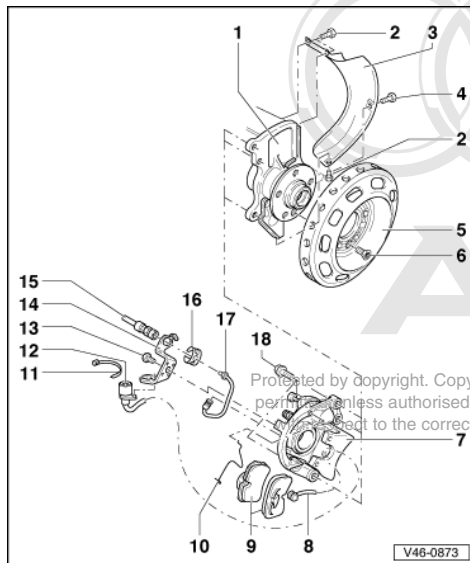
11 Cable tie

- ♦ Replace
- ♦ Attach wire for brake pad wear indicator to bracket Item.- **14** - .

12 Connector

- ♦ Take out of bracket at brake caliper on brake pad replacement

13 Hexagon bolt, 25 Nm



14 Bracket

- ♦ Bolt to brake caliper housing
- ♦ Insert connector for brake pad wear indicator

15 Brake hose

- ♦ Do not disconnect brake hose when changing brake pads

16 Retention spring

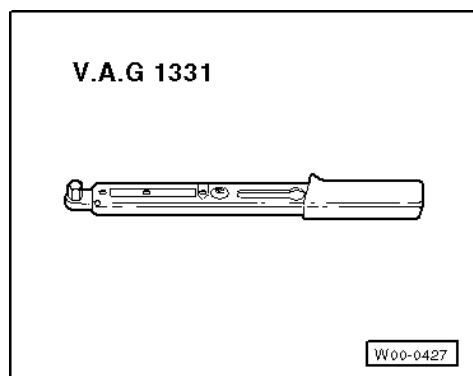
17 Brake pipe, 15 Nm

- ♦ Screw into brake caliper housing
- ♦ Screw into brake hose, counterholding at hexagon on brake hose.

18 Ribbed bolt, 125 Nm

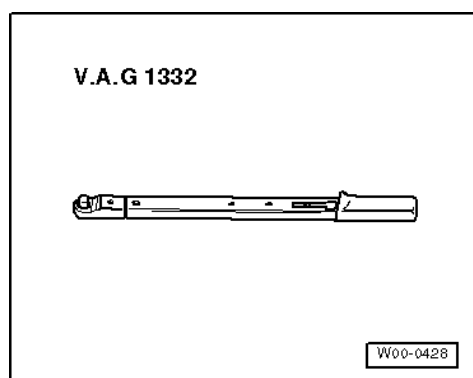
- ♦ Clean ribbing if reusing

1.5 - Removing and installing brake pads



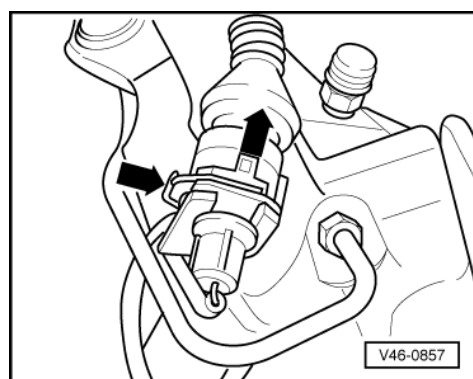
Special tools and workshop equipment required

- ♦ V.A.G 1331 Torque wrench



- ♦ V.A.G 1332 Torque wrench

Removing



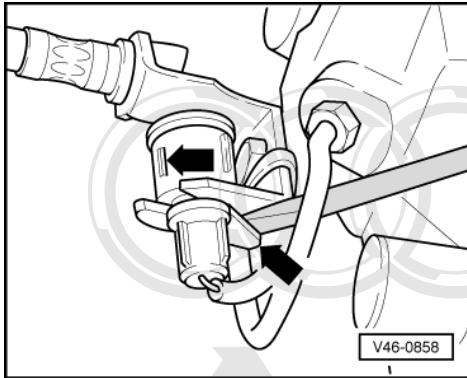
Note:

Mark brake pads to be reused on removal. Reinstall in their original position to prevent uneven braking!

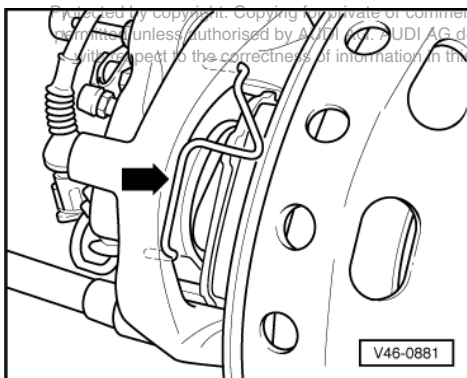
- Jack up vehicle.
- Remove wheel.
- -> Detach connector; to do so, press spring and pull off plug.



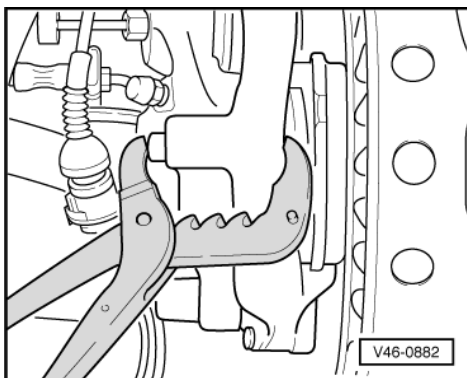
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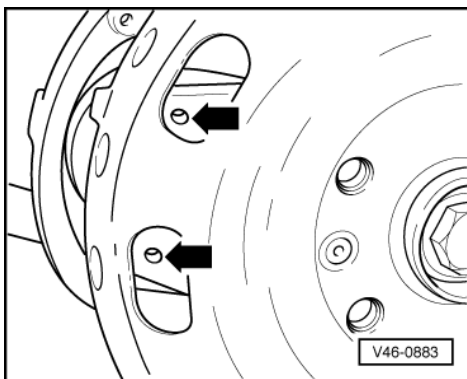
- -> Use screwdriver to carefully lift tab slightly on bottom part of plug, then turn through 90° anti-clockwise or clockwise and remove from bracket.
- Cut through cable tie at bracket.



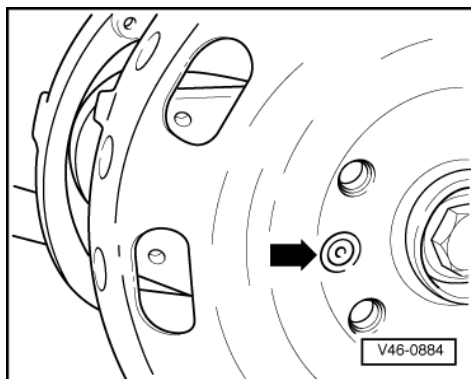
- -> Lever off brake pad retaining spring from brake caliper housing with a screwdriver and remove.



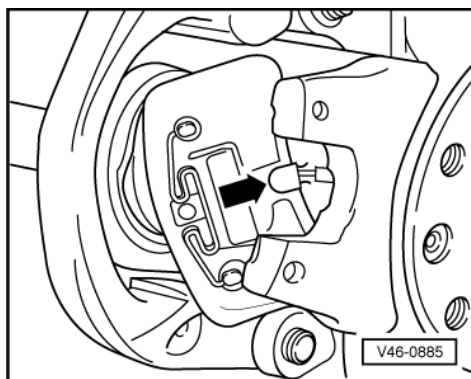
- -> Pressing piston back.



- -> Firmly press brake caliper housing in direction of arrow as far as it will go.
- Take piston-end brake pad out of brake caliper housing.



- -> Screw out bolt for brake disc -arrow- tilt brake disc outwards and detach.
- Take outer brake pad out of brake caliper housing.



- -> Pull wire for brake pad wear indicator off brake pad -arrow-.



Note:

Damaged wires can be replaced after disconnection at coupling.

Thoroughly clean brake caliper housing before installing new brake pads.

In particular, watch for residual adhesive sheet from the outer brake pads.

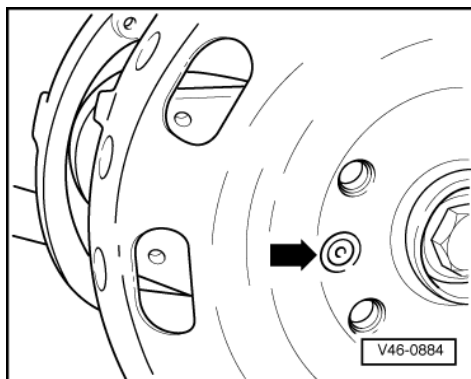
Installing

- Attach wire for brake pad wear indicator to brake pad.
- Insert brake pad with wire for wear indicator.

Note:

Retaining spring of brake pad must be heard to engage in brake caliper.

- Insert bottom part of plug of brake pad wear indicator in bracket at brake caliper.
- Attach new cable tie to bracket.

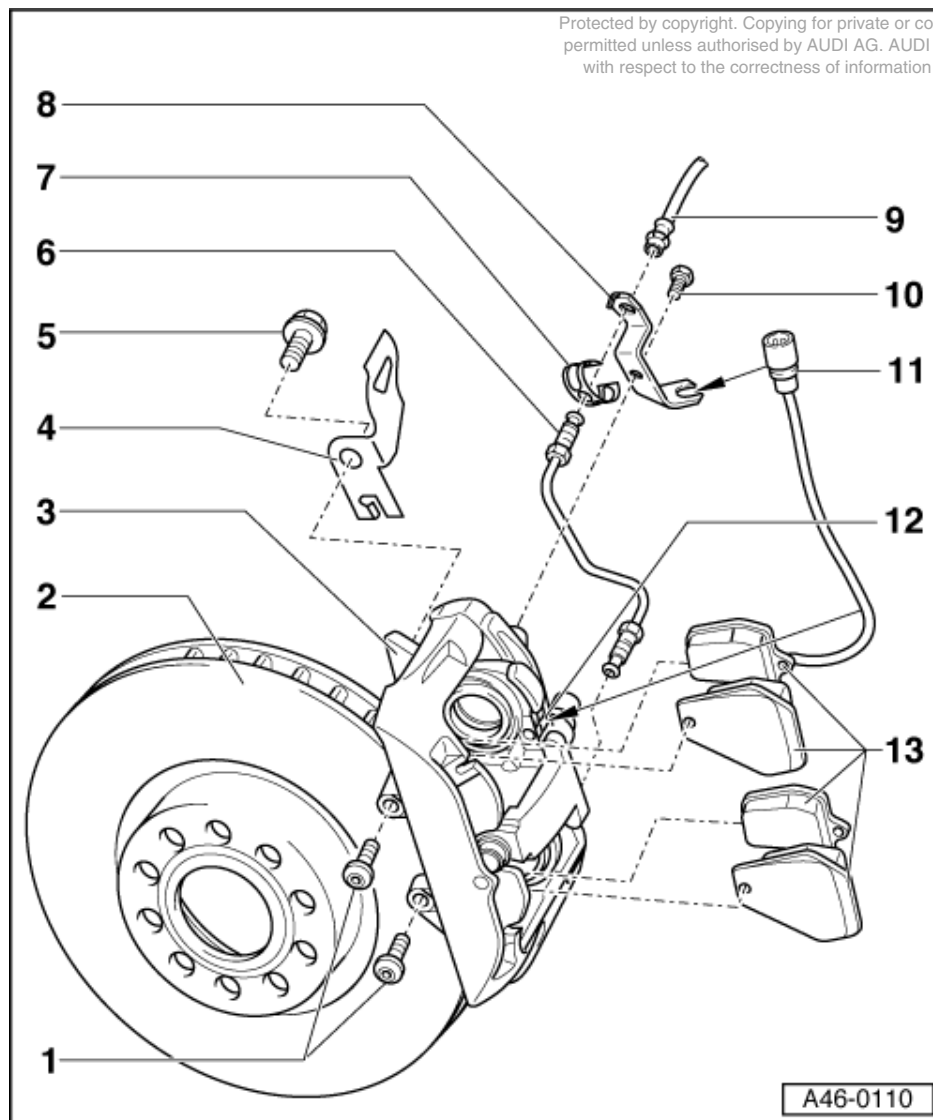


- Insert brake disc.
- > Screw in bolt for brake disc -arrow-.
- Install piston-end brake pad in brake caliper housing.
- Insert retaining spring into brake caliper housing.
- Pull protective sheet off backplates of outer brake pads.

Note:

- ◆ Firmly depress brake pedal several times after each change of brake pads, so that the brake pads are properly seated in their normal operating position.
- Fit wheels to 120 Nm.
- Check brake fluid level and top up if necessary.

1.6 - Servicing front brakes, two-piston brake

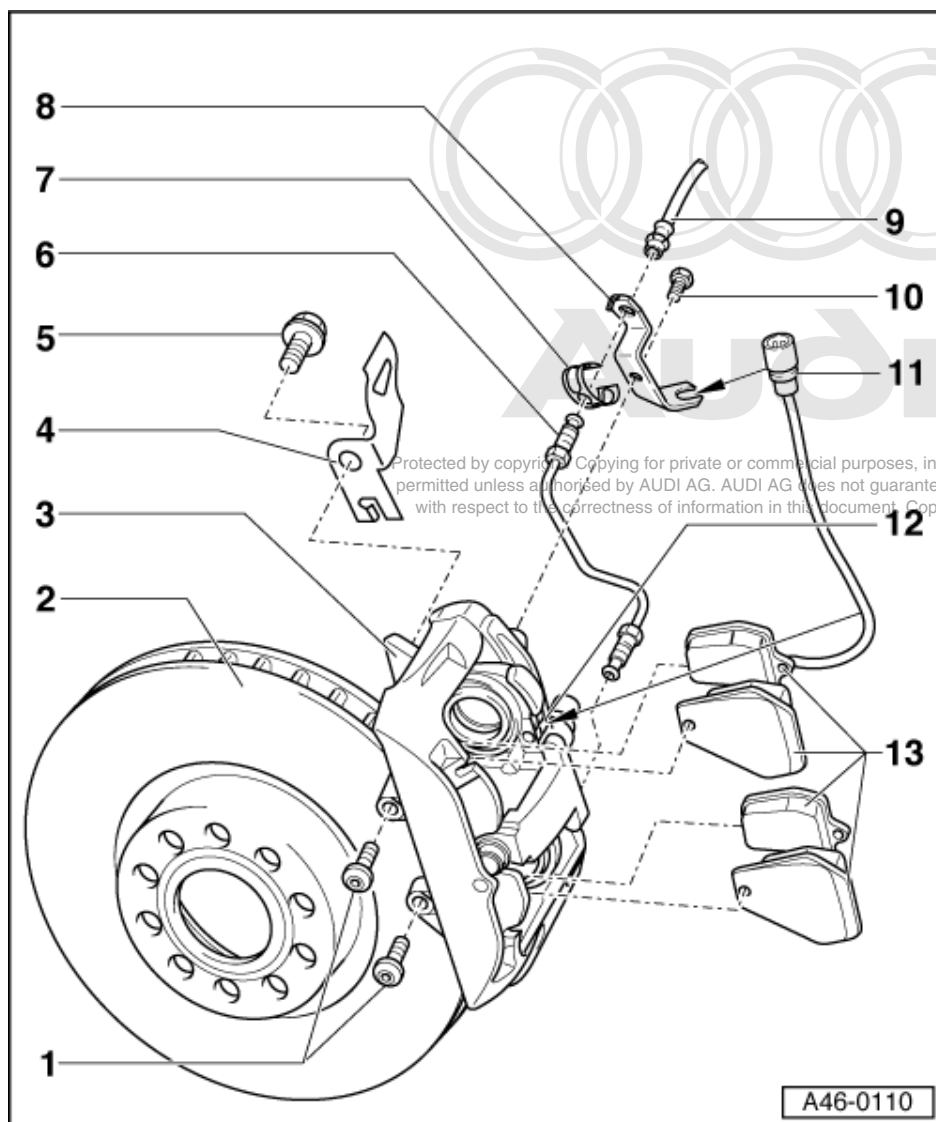


Audi S4/S6, Audi S4.2, Audi S6 Plus

Note:

- ◆ Always install the complete repair kit.
- ◆ After replacing brake pads, depress brake pedal firmly several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.

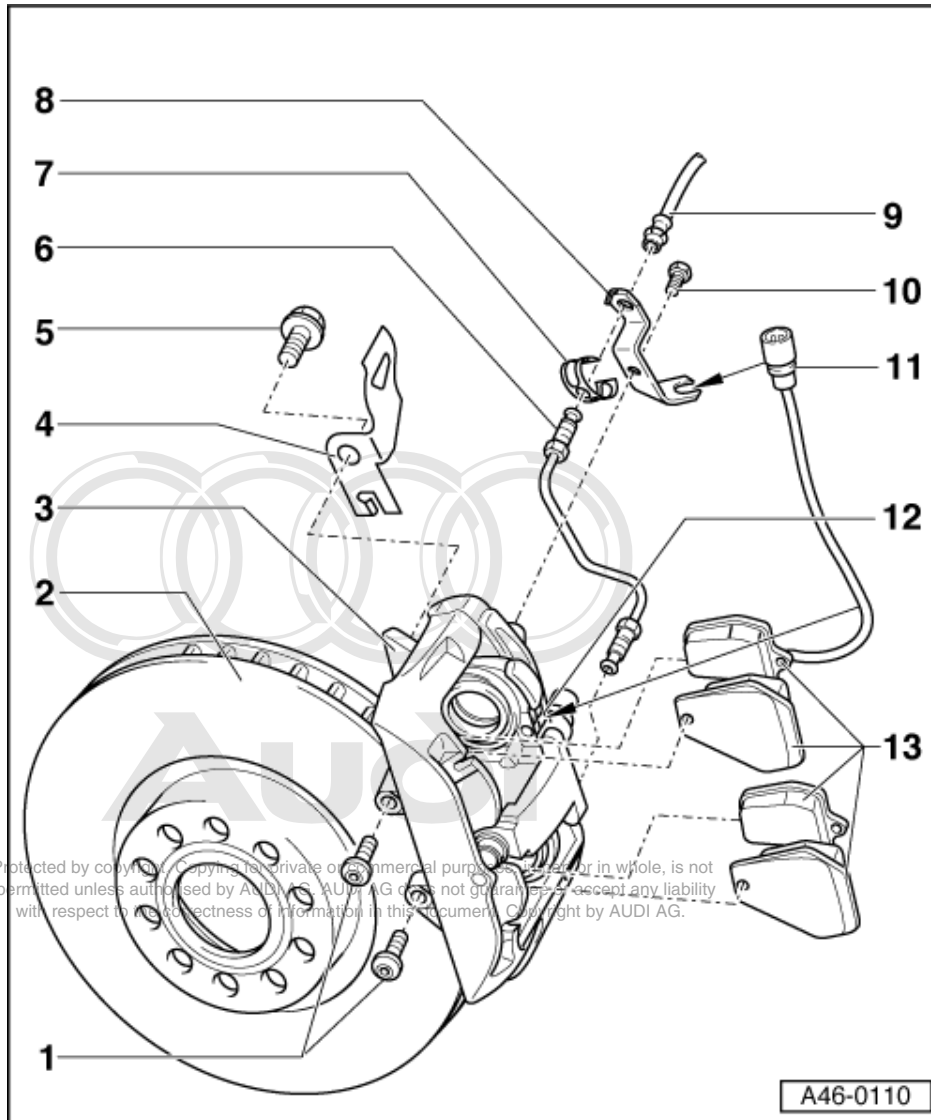
- ♦ To draw off brake fluid from the reservoir, use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must on no account be sucked out by mouth using a hose!



- ♦ Brakes can be checked on all commercially available brake test stands, provided that the driving speed of the two driving rollers of the test stand does not exceed 5.5 km/h.
- ♦ The tightening torque of the brake pipe is 15 Nm.

1 Torx bolts, 25 Nm

- ♦ Always replace
- ♦ Remove and insert using commercially available Torx socket (e.g. Hazet T40)
- ♦ Included in brake pad repair set

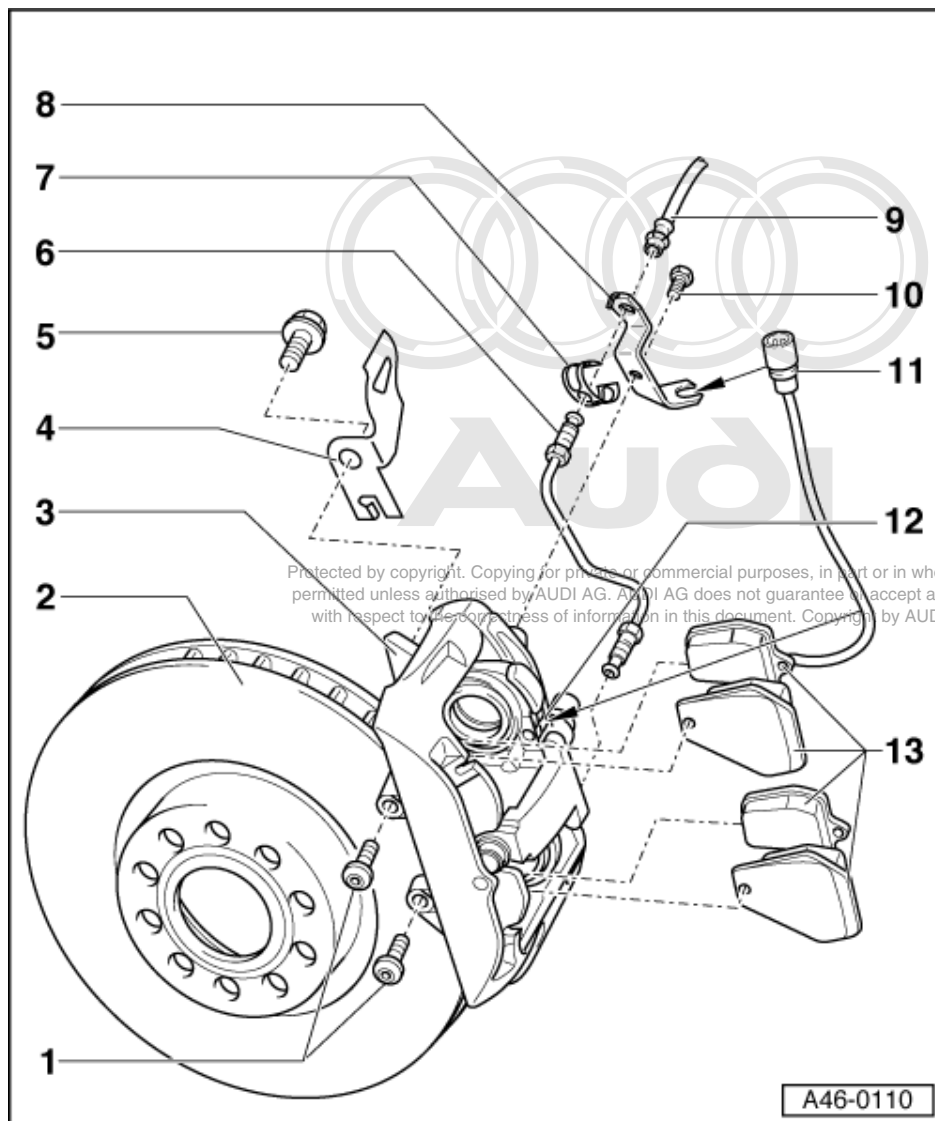


2 Brake disc

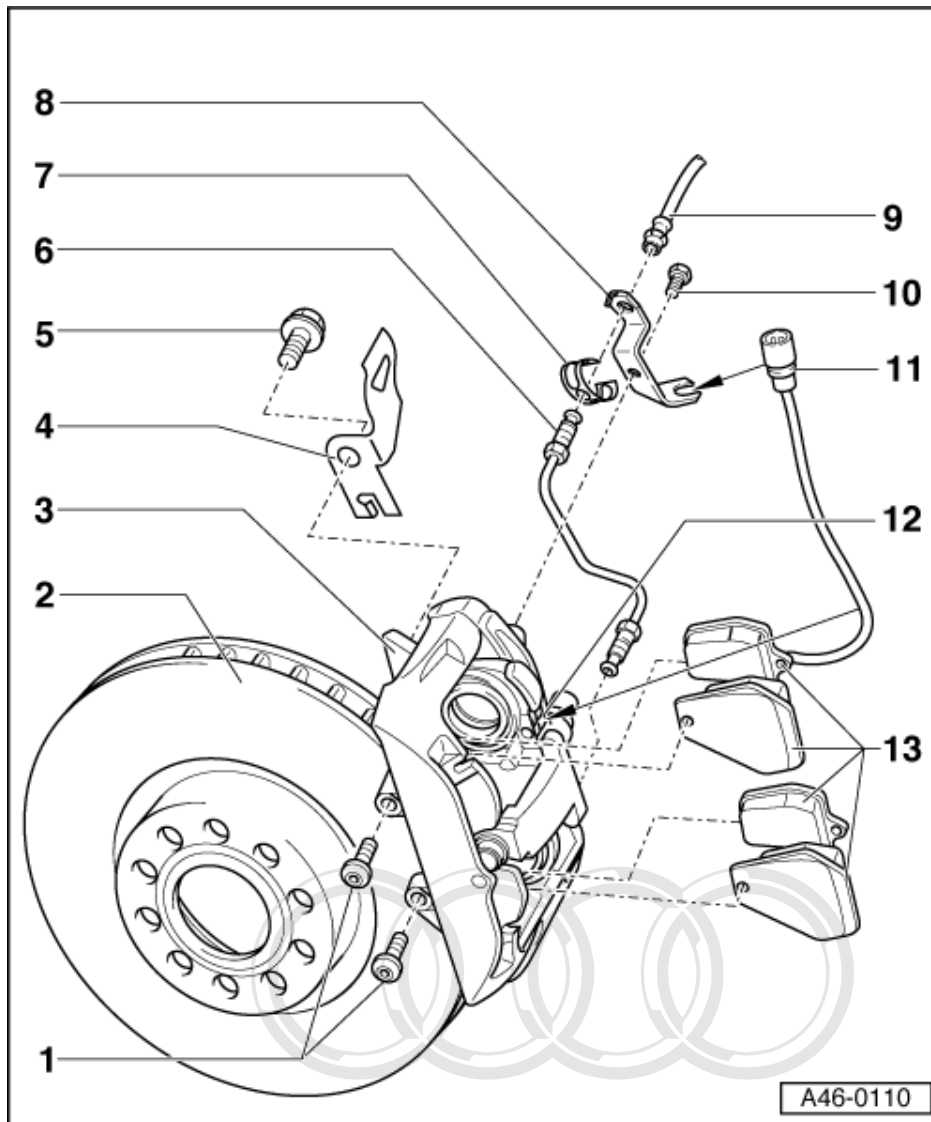
- ◆ Always replace on both sides of the car
- ◆ Ensure adequate wear reserve
- ◆ Remove brake caliper prior to removing
- ◆ Internally ventilated brake disc: $\varnothing$ 314 mm
- ◆ Brake disc thickness: 30 mm
- ◆ Wear limit: 28 mm
- ◆ Internally ventilated brake disc on Audi S6 Plus (240 KW) as of 06.96: $\varnothing$ 323 mm
- ◆ Brake disc thickness: 30 mm
- ◆ Wear limit: 28 mm

3 Brake calipers

- ◆ If assembly work is required, do not leave caliper hanging from brake hose but secure it to bodywork with wire
- ◆ Adapted to brake disc dia. of $\varnothing$ 323 mm on Audi S6 Plus (240 KW) as of 06.96



- 4 Ribbed bolt, 250 Nm**
 - ♦ Clean ribbing if reusing
- 5 Brake pipe, 15 Nm**
- 6 Retention spring**
- 7 Bracket**
 - ♦ Bolt to brake caliper housing
 - ♦ Insert connector for brake pad wear indicator
- 8 Brake hose**
 - ♦ Do not unscrew to replace brake pads
- 9 Hexagon bolt, 25 Nm**
- 10 Connector**
 - ♦ Take out of bracket at brake caliper on brake pad replacement



11 Cable holder

- ◆ Insert cable for brake pad wear indicator into cable holder

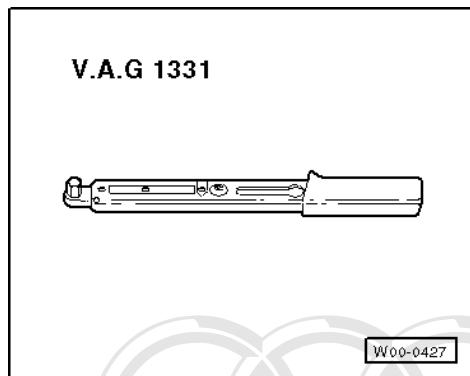
12 Brake pads

- ◆ Always replace on both sides of the car
- ◆ Different designs on left and right
- ◆ Removing and installing => Page 60
- ◆ With wear indicator
 - Once wear limit is reached, warning light in dash panel insert comes on.
- ◆ Pad thickness: 14 mm
- ◆ The outer brake pads are provided with an adhesive sheet on the backing plate of the pad. Remove the protective sheet before inserting pads.
- ◆ check thickness

=> Audi 100 1991; Maintenance

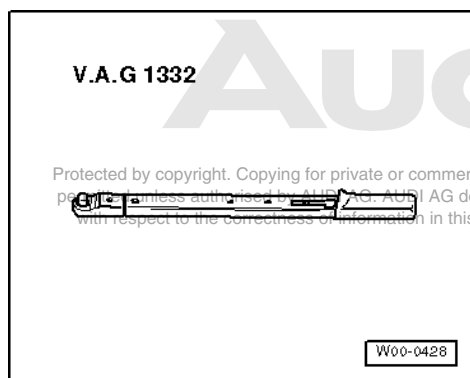
- ◆ Wear limit: 7 mm including backplate

1.7 - Removing and installing brake pads



Special tools and workshop equipment required

- ♦ V.A.G 1331 Torque wrench



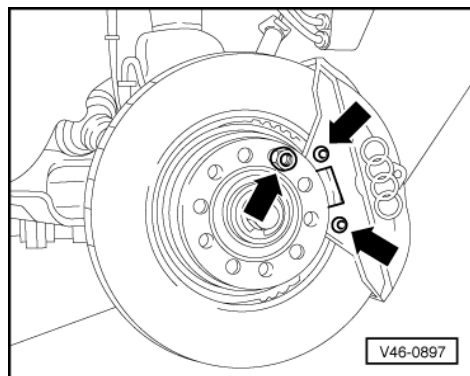
- ♦ V.A.G 1332 Torque wrench

Removing

Note:

Mark brake pads to be reused on removal. Reinstall in their original position to prevent uneven braking!

- Jack up vehicle.
- Remove wheels.



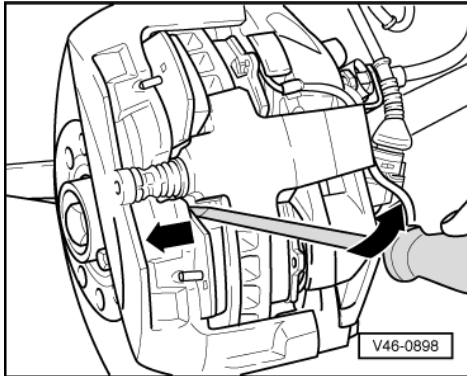
- -> Secure brake disc with a wheel bolt.
- Unscrew both Torx bolts for the outer brake pads.

Note:

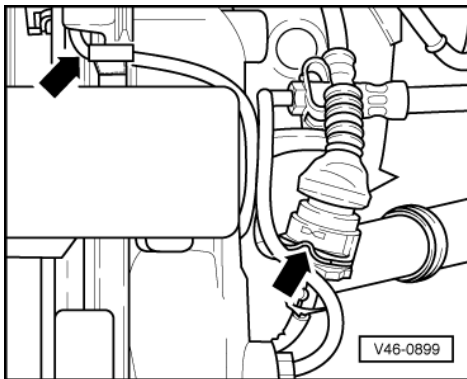
Before pressing back the piston, extract brake fluid from the brake fluid reservoir with a bleeder bottle. Otherwise brake fluid - which was used to top up the brake fluid reservoir-, may run out and cause damage.

Warning!

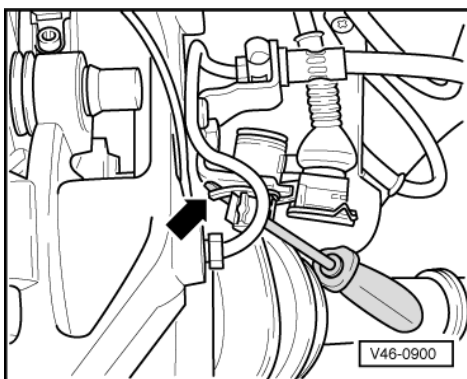
Brake fluid is poisonous and must on no account be siphoned orally through a hose.



- -> Press piston back into brake caliper housing.
- To do so, insert sliding caliper with screwdriver as shown and press firmly outwards.
- First remove outer brake pad, to do so, use screwdriver to press brake pads off brake caliper.

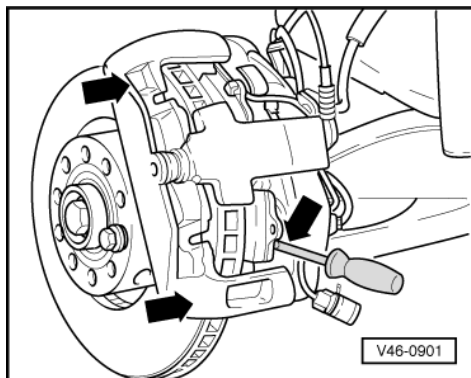


- -> Detach connector; to do so, press spring and pull off plug.
- Pull wire for brake pad wear indicator out of bracket at brake caliper.



- -> Use screwdriver to carefully lift tab slightly on bottom part of plug, then turn through 90° anti-clockwise or clockwise and remove from bracket.

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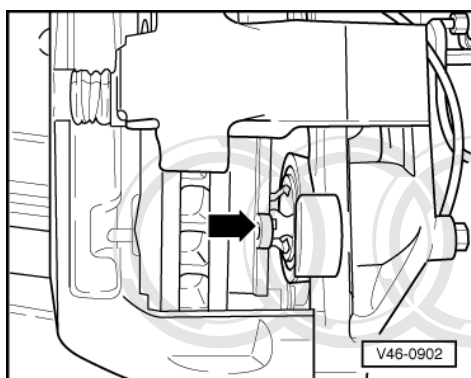
- -> Firmly press floating caliper in direction of arrow as far as it will go.
- Use screwdriver to carefully press brake pads out of piston and remove from brake caliper housing.

Note:

Thoroughly clean brake caliper housing before installing new brake pads.

In particular, watch for residual adhesive sheet from the outer brake pads.

Installing

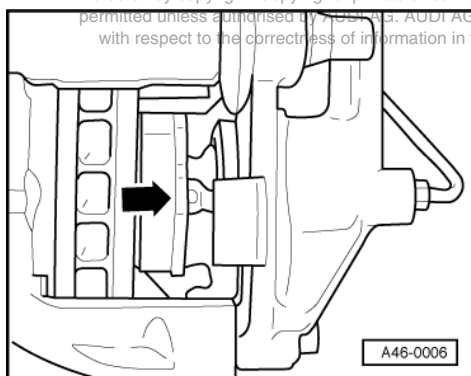


- -> Insert brake pad with wire for wear indicator into upper piston.

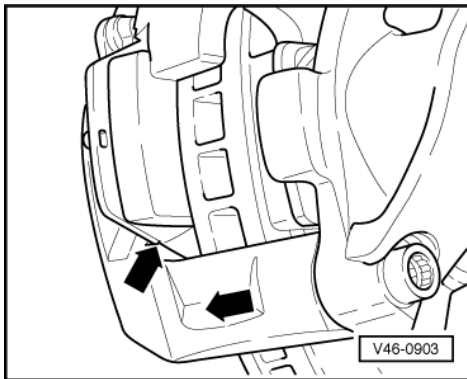
Note:

Take care not to damage protective caps when inserting brake pads.

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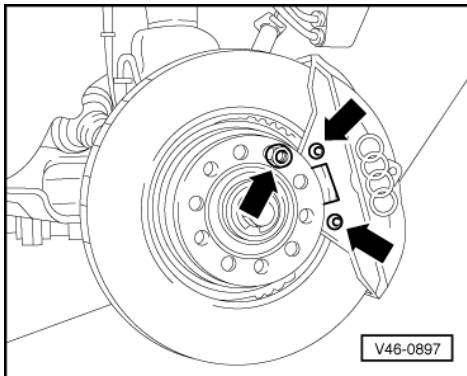
- -> Insert lower brake pad in piston.
- Clip wire for brake pad wear indicator into bracket at brake caliper.
- Insert bottom part of plug of brake pad wear indicator in bracket at brake caliper.



- -> Press floating caliper outwards as far as it will go.
- Pull protective sheet off backplates of outer brake pads.

Note:

- ♦ The repair kit includes four self locking Torx bolts which must be installed in all cases.
- ♦ Firmly depress brake pedal several times after each change of brake pads, so that the brake pads are properly seated in their normal operating position.



- -> Screw the Torx bolts from the repair set into the floating caliper and fix the brake pads in position.
- ♦ Tightening torque: 25 Nm
- Unscrew wheel bolt from wheel hub.

Note:

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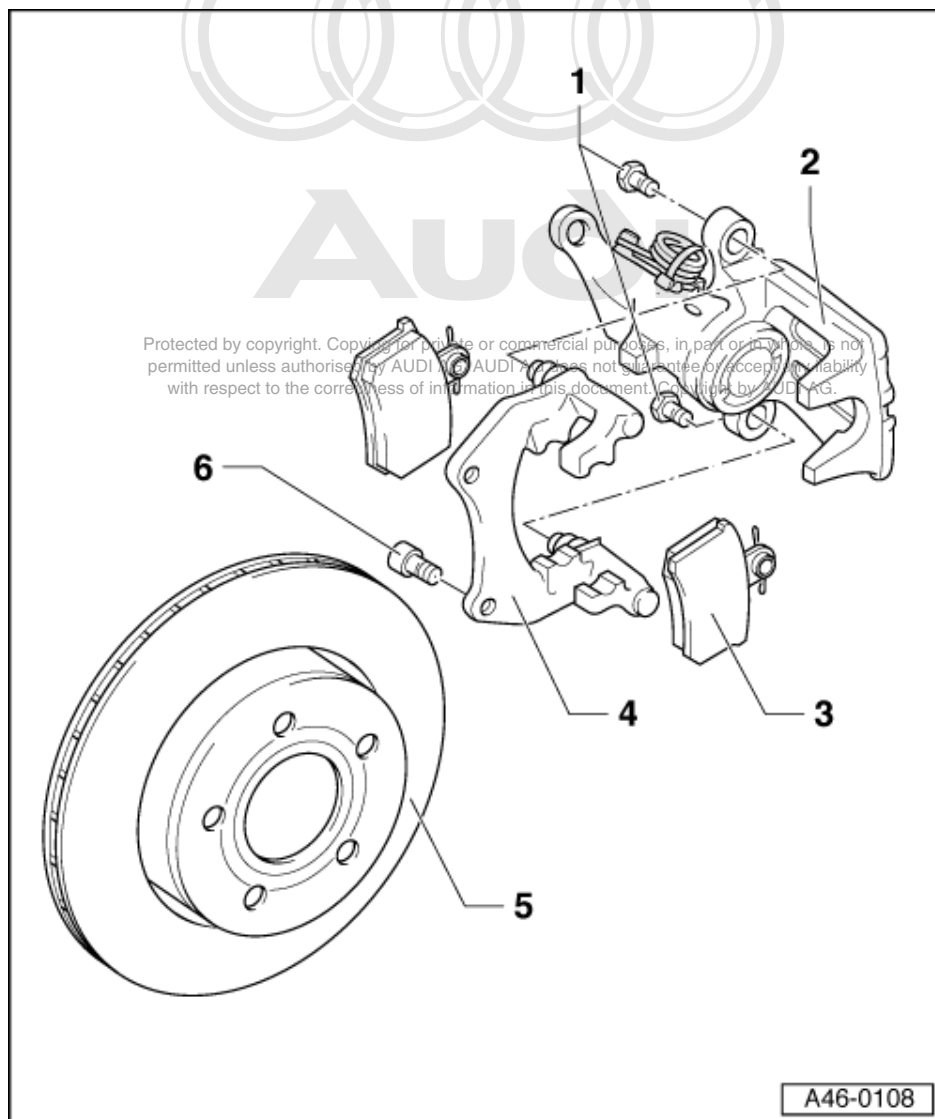
When fitting on the wheels, make sure that the rim flange is not mounted onto the brake caliper.

This could otherwise press the brake pads out of their guides.

- Fit wheels to 120 Nm.
- Check brake fluid level and top up if necessary.

2 - Servicing rear wheel brake (disc brake)

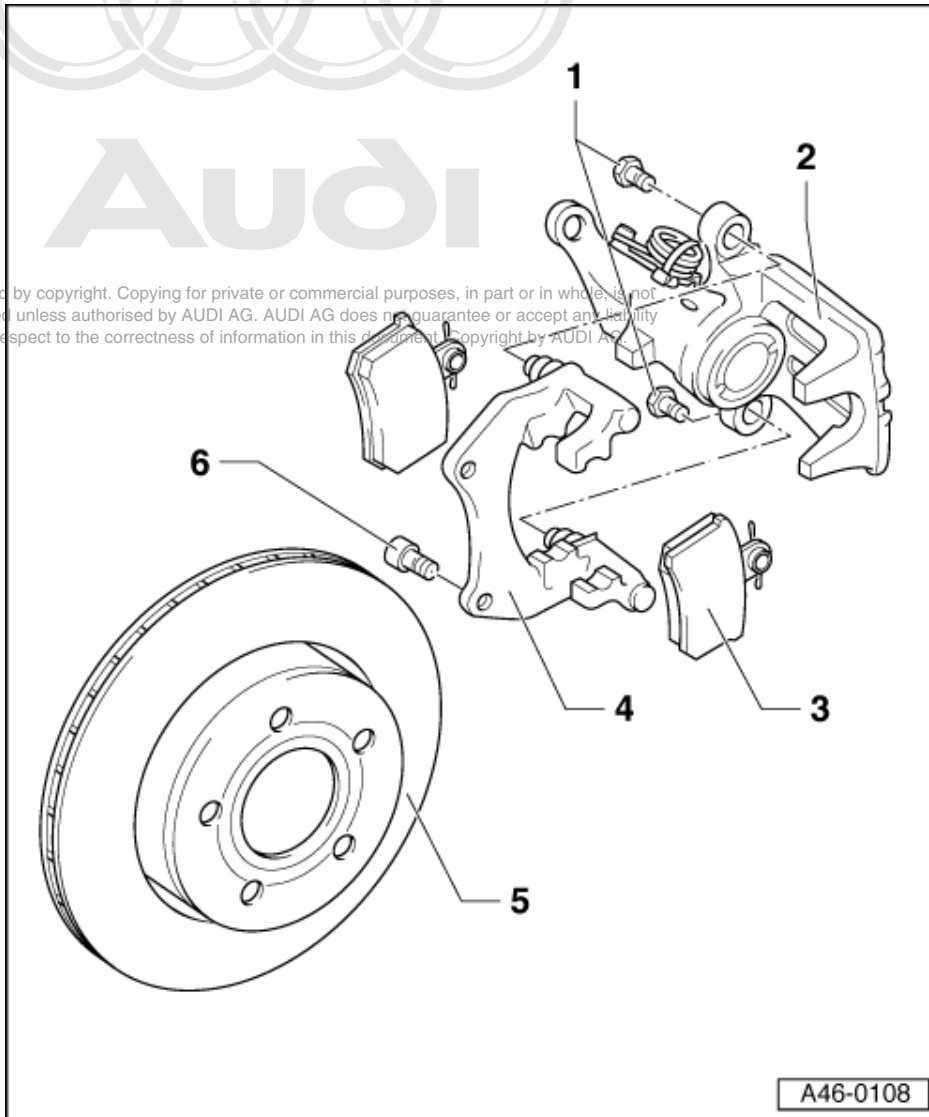
2.1 - Servicing rear wheel brake (disc brake)



Rear brakes with automatic adjustment

Note:

- ♦ Always install the complete repair kit.
- ♦ After replacing brake pads, depress brake pedal firmly several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.
- ♦ To draw off brake fluid from the reservoir, use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must on no account be sucked out by mouth using a hose!



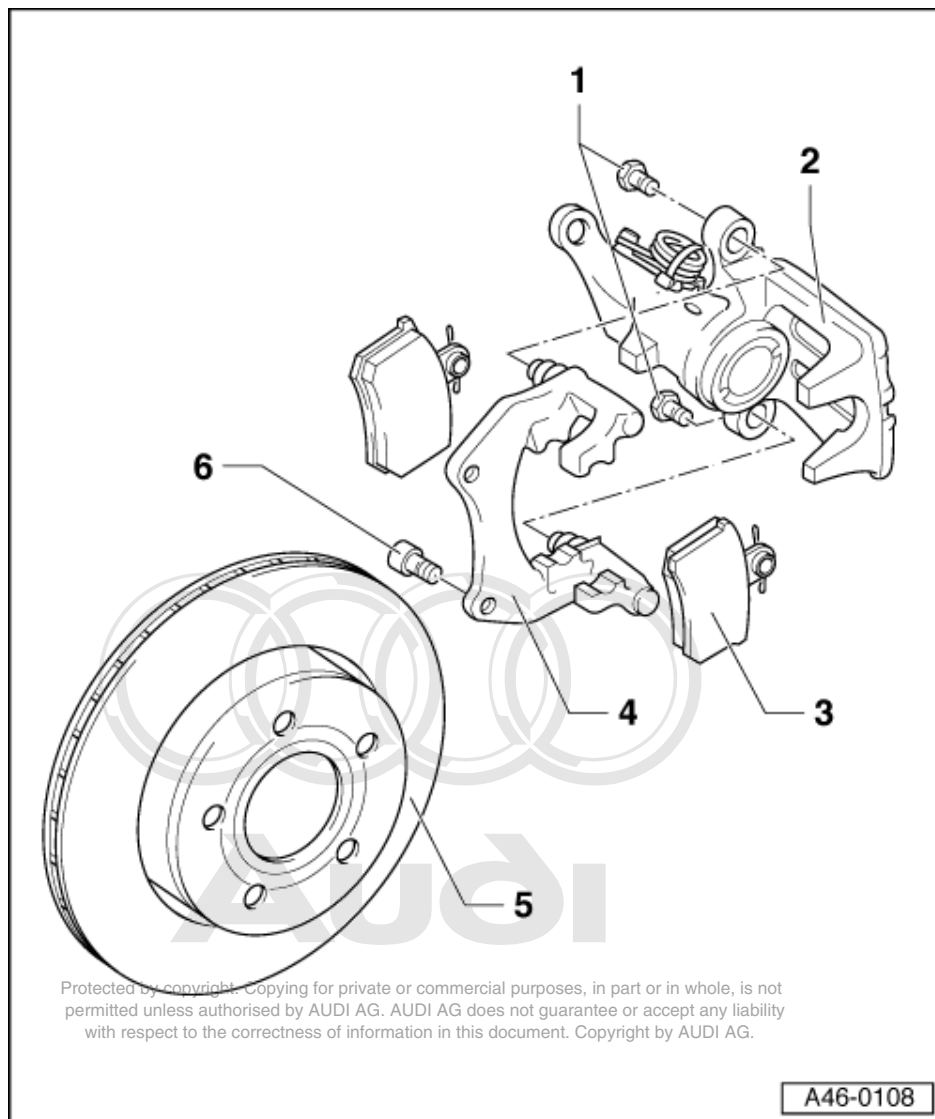
- ♦ Brakes can be checked on any commercially available brake test stand, provided that the driving speed of the two driving rollers of the test stand is not more than 5.5 km/h.
- ♦ The tightening torque of the brake pipe is 15 Nm.

1 Hexagon bolt, Self-locking , 35 Nm

- ♦ Always replace
- ♦ When loosening and tightening counter hold on guide pin

2 Brake caliper housing

- ♦ Do not disconnect brake hose when changing brake pads
- ♦ Servicing brake calipers => Page **110**



3 Brake pads

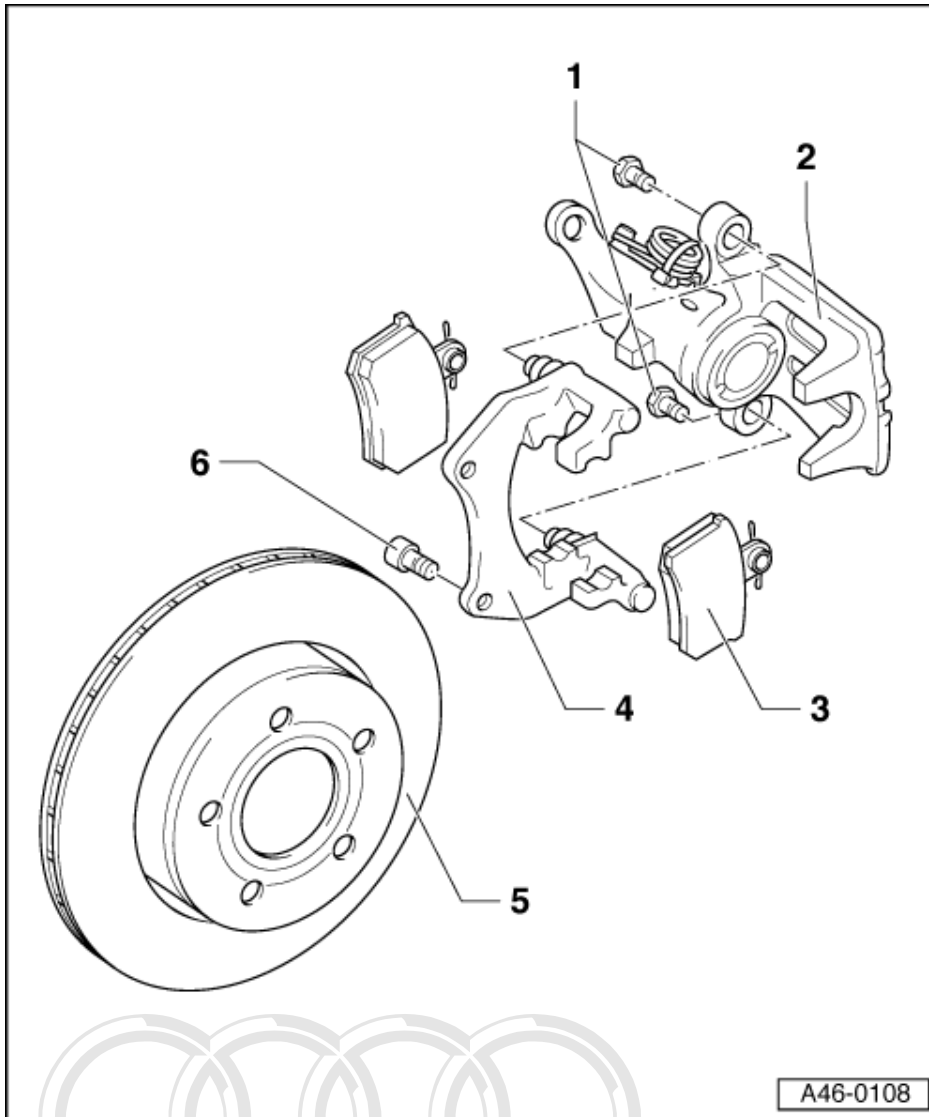
- ◆ Always replace on both sides of the car
- ◆ Removing and installing => Page 68
- ◆ Thickness 12 mm
- ◆ Checking thickness:

=> Audi 100 1991; Maintenance

- ◆ Wear limit: 7 mm (including back plate)

4 Brake carrier with guide pin and protective cap

- ◆ Supplied as replacement part assembled with sufficient quantities of grease on guide pins
- ◆ If protective caps or guide pins are damaged, install repair kit. Use grease sachet supplied to lubricate guide pins.

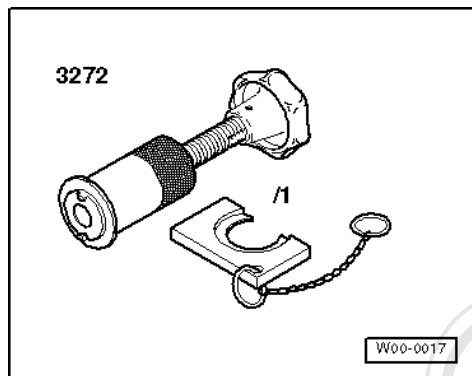


5 Brake disc

- ◆ Always replace on both sides of the car
- ◆ Remove brake caliper prior to removing
- ◆ Always dress evenly, on both sides, starting from thickness when new
- ◆ Brake disc diameter
 - ventilated: 269 mm
 - non-ventilated: 245 mm
- ◆ Brake disc thickness
 - ventilated: 20 mm
 - non-ventilated 10 mm
- ◆ Wear limit
 - ventilated: 18 mm
 - non-ventilated 8 mm

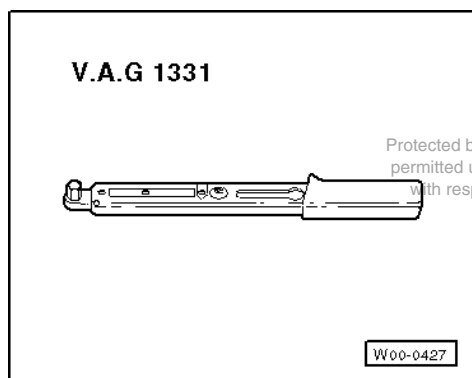
6 Cheese-head bolt, 60 Nm

2.2 - Removing and installing brake pads



Special tools and workshop equipment required

- ♦ 3272 Resetting and removing tool



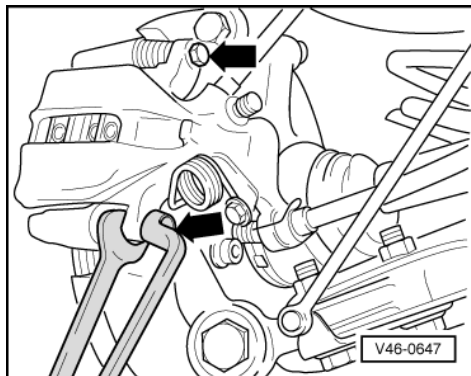
- ♦ V.A.G 1331 Torque wrench

Removing

Note:

Mark brake pads to be reused on removal. Reinstall in their original position to prevent uneven braking!

- Jack up vehicle.
- Remove wheels.



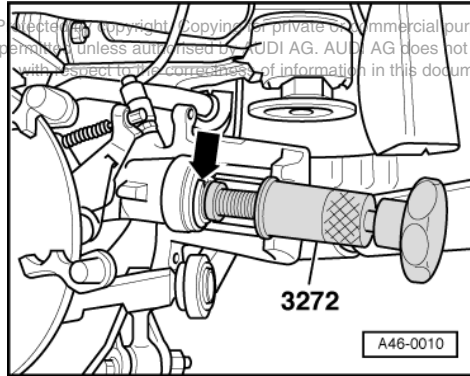
- -> Remove bolts from brake caliper housing, counterholding on guide pins.
- Remove brake pads.

Installing

Before inserting new brake pads, press piston back into the cylinder with resetting tool. Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise brake fluid which was used to top up the brake fluid reservoir, may run out and cause damage.

Warning!

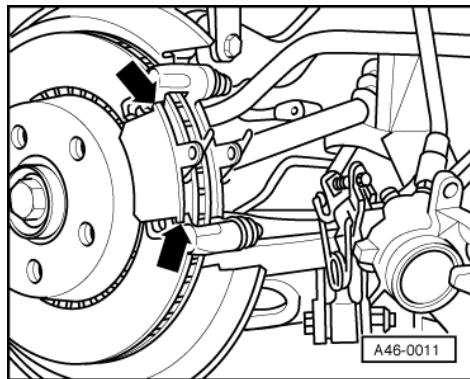
Brake fluid is poisonous and must on no account be siphoned orally through a hose.



- -> Screw piston by turning knurled wheel of special tool 3272 clockwise.

Note:

- ◆ Fit special tool 3272 so that the collar of the tool is seated against the brake carrier.
- ◆ If the piston is pushed back with a piston resetting tool the automatic adjustment in the brake caliper will be destroyed.
- Pull protective foil off outer brake pad backplate.

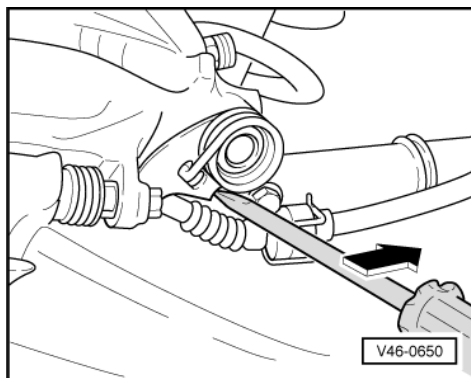


- -> Insert brake pads.
- Tighten bolts on brake caliper housing, 35 Nm.

Note:

- ◆ The repair kit includes four self-locking hexagon bolts which must be installed in all cases.
- ◆ Firmly depress brake pedal several times after each change of brake pads, so that the brake pads are properly seated in their normal operating position.
- Fit wheels to 120 Nm.
- Check brake fluid level and top up if necessary.

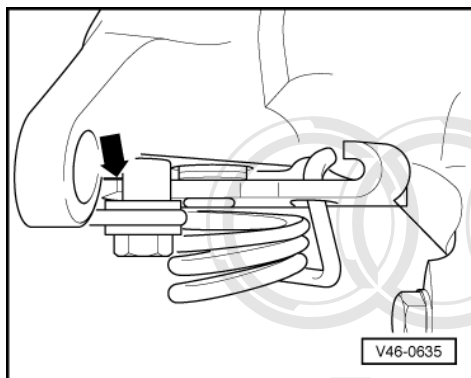
2.3 - Basic setting of rear wheel brake



Handbrake cable must not be pretensioned when performing basic setting (release handbrake).

Check:

- -> Use screwdriver to alternately press levers for handbrake cable against. . .



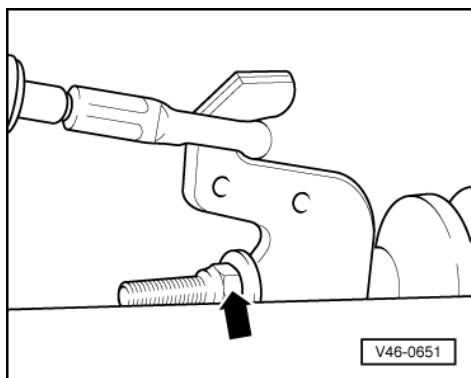
- -> . . . stop (see arrow).

If lever of opposite brake caliper is pulled off stop, then handbrake cable is excessively pretensioned.

Note:

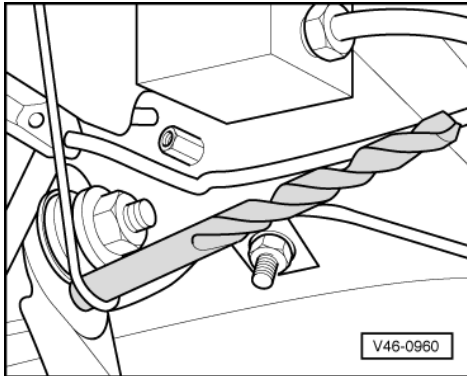
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For ease of illustration, stop is shown with brake caliper removed. AUDI AG.



- -> Slacken off adjusting nut -arrow- for handbrake cable until both levers make contact with stop of brake caliper.

Vehicles with pressure regulator



- -> Jam drill bit of at least $\varnothing 6$ mm dia. between end of spring at bottom and mount.
- Press brake pedal twice.
- Take out drill bit.
- Check whether both wheels can spin freely.

Vehicles with self-levelling suspension

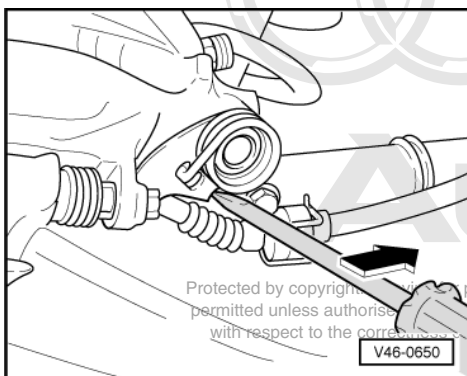
- Stand vehicle on ground.
- Leave engine idling for at least 2 minutes.
- Switch off ignition.
- Press brake pedal twice.
- Check whether both wheels can spin freely.

2.4 - Adjusting handbrake

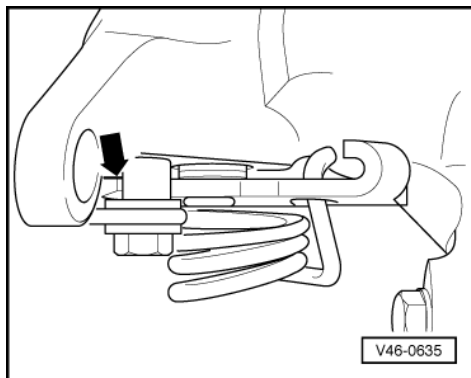
Note:

- ♦ Due to the automatic rear wheel brake adjustment there is no requirement to adjust the handbrake. Adjustment is only necessary if the handbrake cables, brake calipers, brake pads and brake discs are renewed.
- ♦ The foot brake system must have been bled and must be functioning properly.
- ♦ Handbrake must be adjusted before installing centre console and handbrake trim.

Checking basic setting:



- -> Use screwdriver to alternately press levers for handbrake cable against . . .



- -> . . . stop (see arrow).

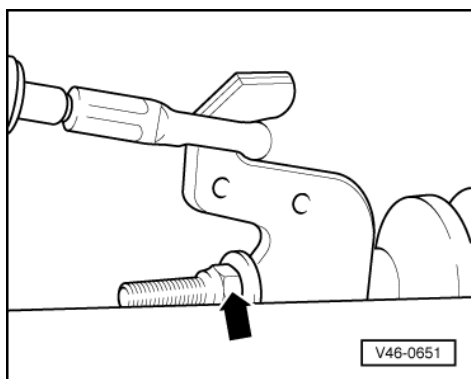
If lever of opposite brake caliper is pulled off stop, then handbrake cable is excessively pretensioned.

Note:

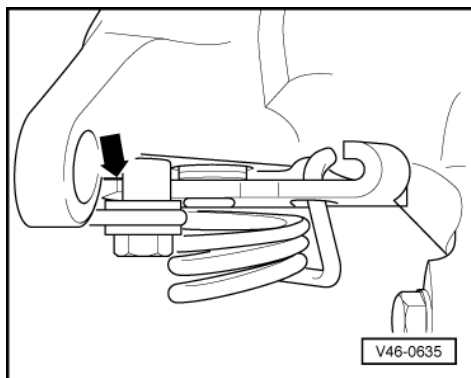
For ease of illustration, stop is shown with brake caliper removed.

Adjusting:

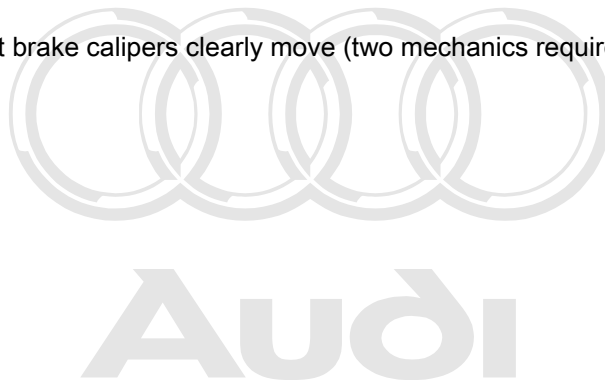
- Depress brake pedal firmly at least 1*.
- Handbrake lever in release position.



- -> Slacken off adjusting nut -arrow- for handbrake cable until both levers make contact with stop of brake caliper.
- Tighten nut on connecting rod until both levers at brake calipers clearly move (two mechanics required).



- Depress handbrake firmly at least 3*.
- -> Set adjusting nut on connecting rod such that one lever at one brake caliper just lifts off stop.
- Re-check basic setting => Page 71



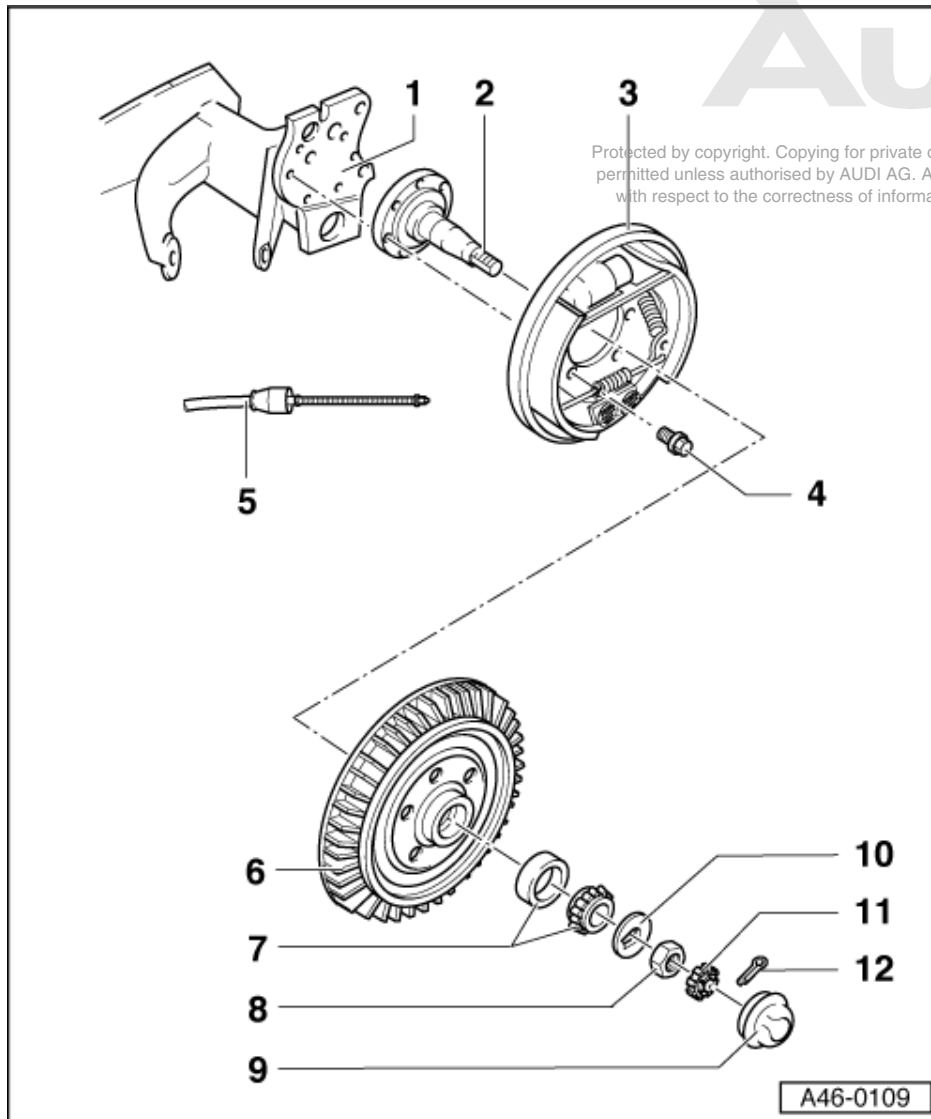
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Note:

For ease of illustration, stop is shown with brake caliper removed.

3 - Servicing rear wheel brake (drum brake)

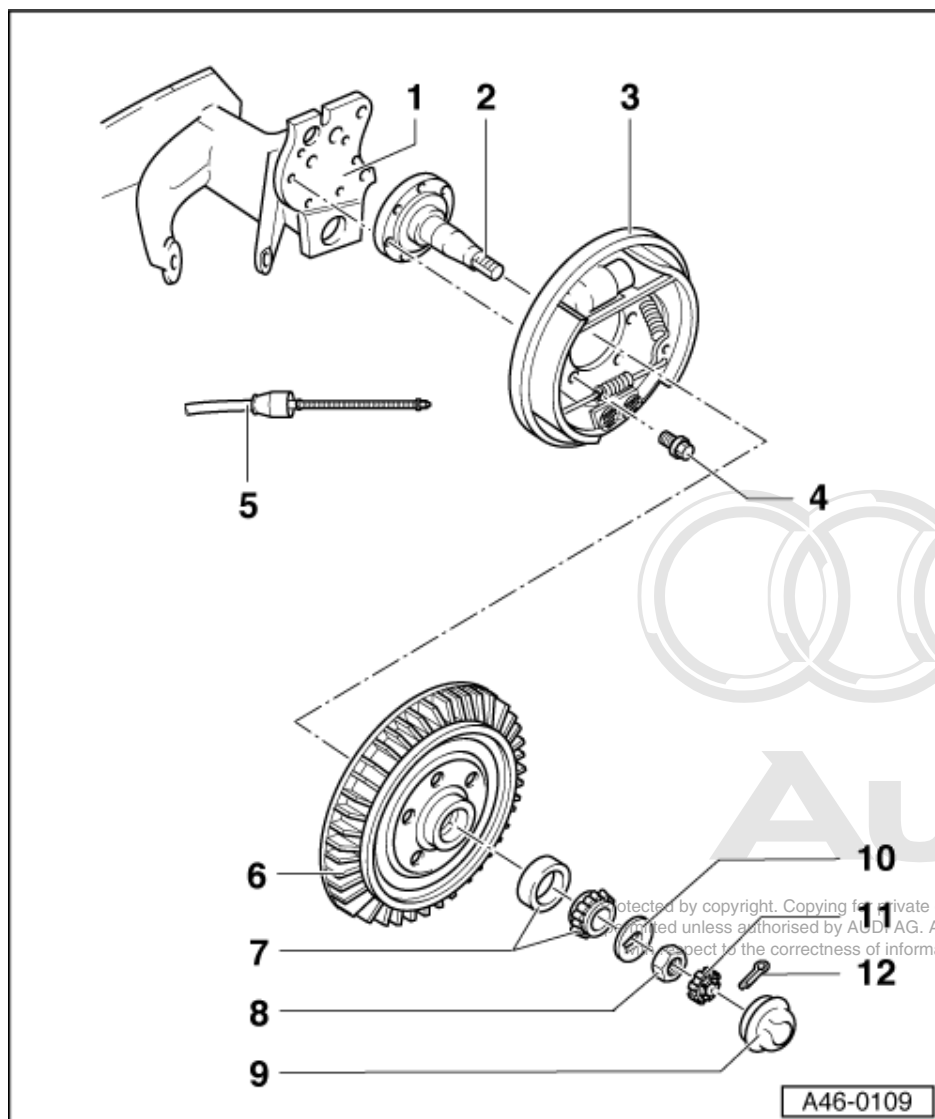
3.1 - Servicing rear wheel brake (drum brake)



3.2 - Removing and installing rear brake

- 1 Axle beam
- 2 Stub axle
- 3 Brake carrier with brake shoes
 - ♦ reset before removing brake drum
=> Page 76
- 4 Hexagon bolt, 30 Nm
- 5 Handbrake cable
 - ♦ Adjusting handbrake

=> Page 81



6 Brake drum

- ◆ Brake drum diameter, 230 mm
- ◆ Wear limit 231 mm
- ◆ Clean carefully, check for wear, damage, dimensional accuracy, damaged wheel bolt threads and perfect brake contact surface

7 Outer wheel bearing

8 Hexagon nut

- ◆ Adjusting wheel bearing play
=> Fig. 3

9 Grease cap

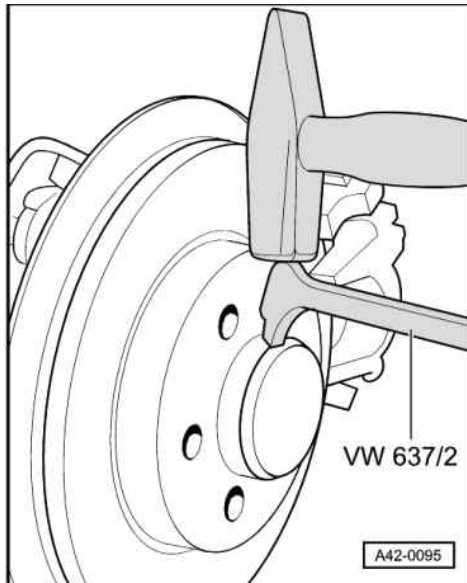
- ◆ Pressing off => Fig. 1 and 2
- ◆ Pressing in => Fig. 4

10 Thrust washer

11 Locking ring

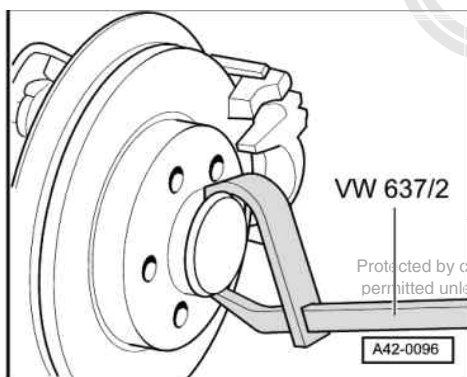
12 Split pin

- ◆ Replace

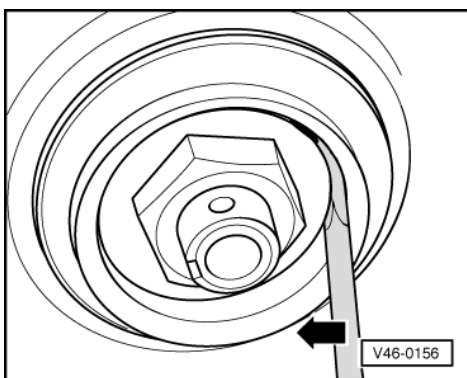


-> Fig.1 Pressing off grease cap

- Tap gently to detach grease cap from its seat.



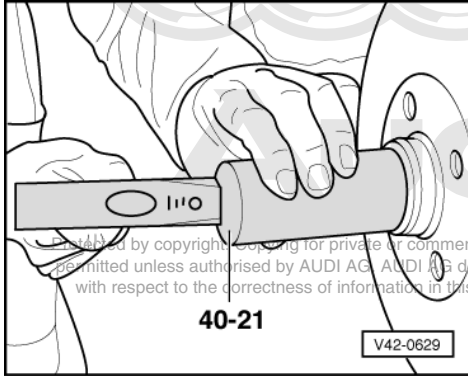
-> Fig.2 Pressing off grease cap



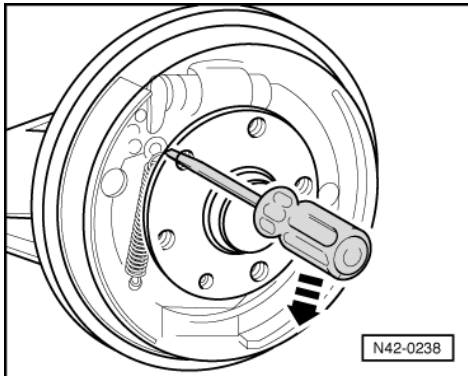
-> Fig.3 Adjusting wheel bearing play**Note:**

It must be possible to move the thrust washer by exerting pressure using a screwdriver (without leverage).

- Secure with locking ring and new split pin.

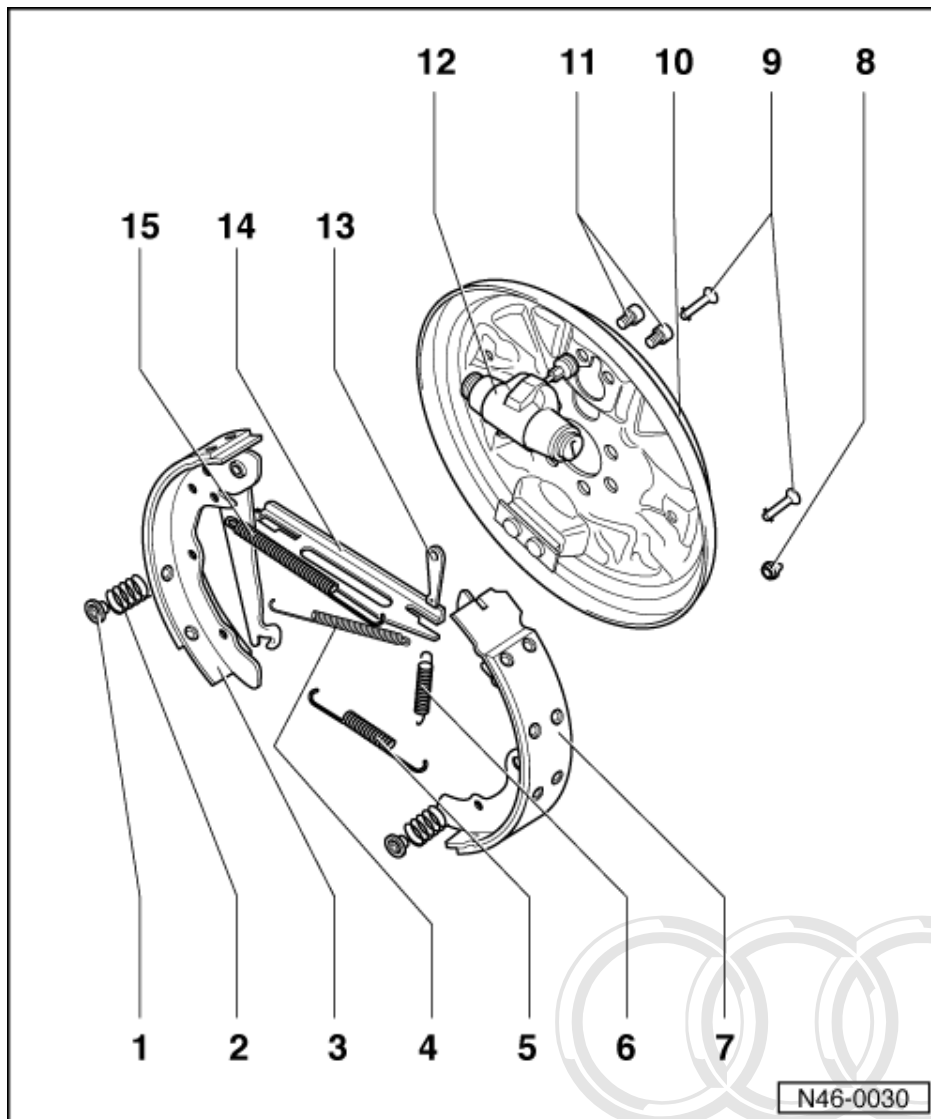
**-> Fig.4 Driving home grease cap****Note:**

- ♦ Always replace damaged grease caps.
- ♦ Damaged grease caps allow ingress of moisture. Therefore, always use the tool shown.

3.3 - Resetting brake

- -> Insert screwdriver through wheel-bolt tapped hole in brake drum to press up key.

3.4 - Servicing rear brakes



After performing work on rear brake:

- ◆ Release handbrake.
- ◆ Firmly press brake pedal once.

1 Spring plate

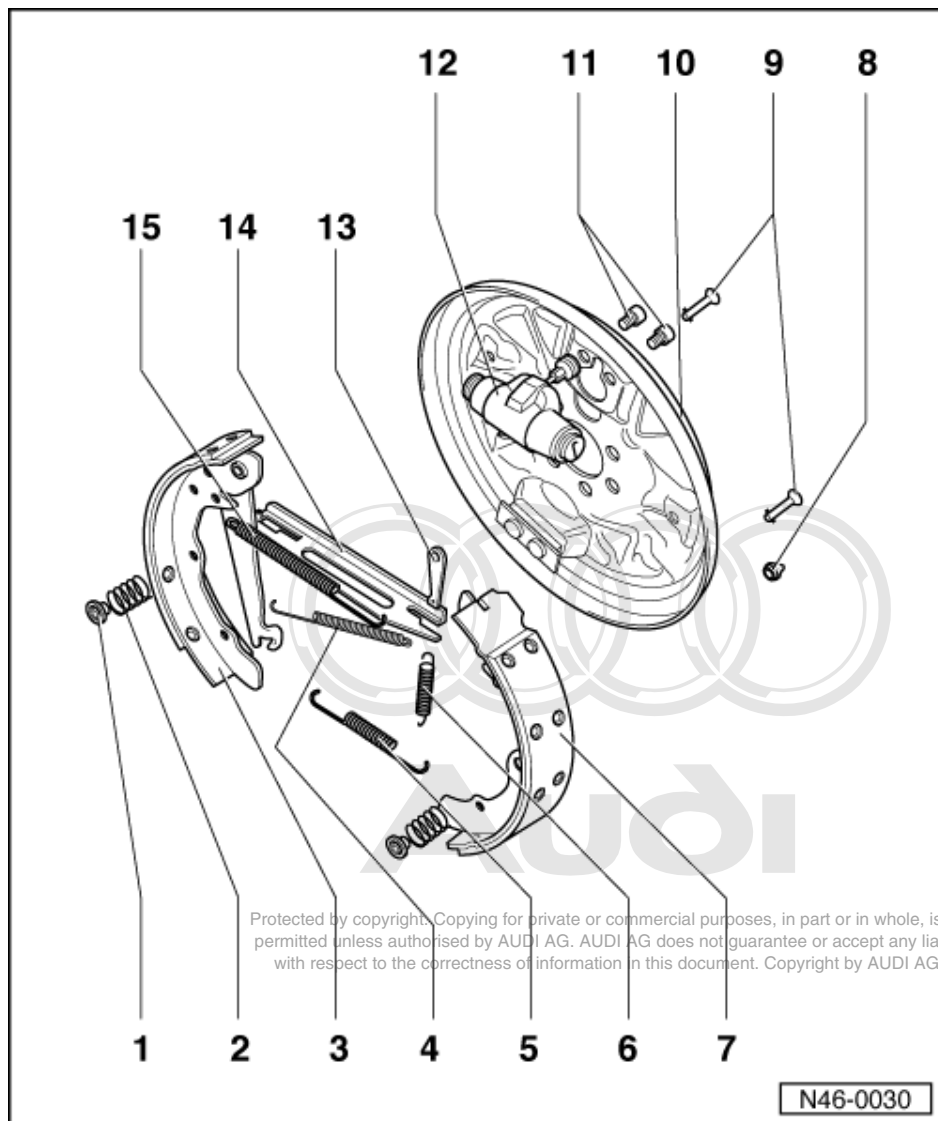
- ◆ To remove, press against compression spring and turn through 90°

2 Spring

3 Brake shoe with lever for handbrake

- ◆ Removing and installing
=>Page 80
- ◆ Adjusting handbrake=>Page 81

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4 Upper return spring

- ♦ Disengage with spring pincers

5 Lower return spring

- ♦ Grease contact points with lubricating paste, part- no. G 000 650

6 Tension spring

7 Brake shoe

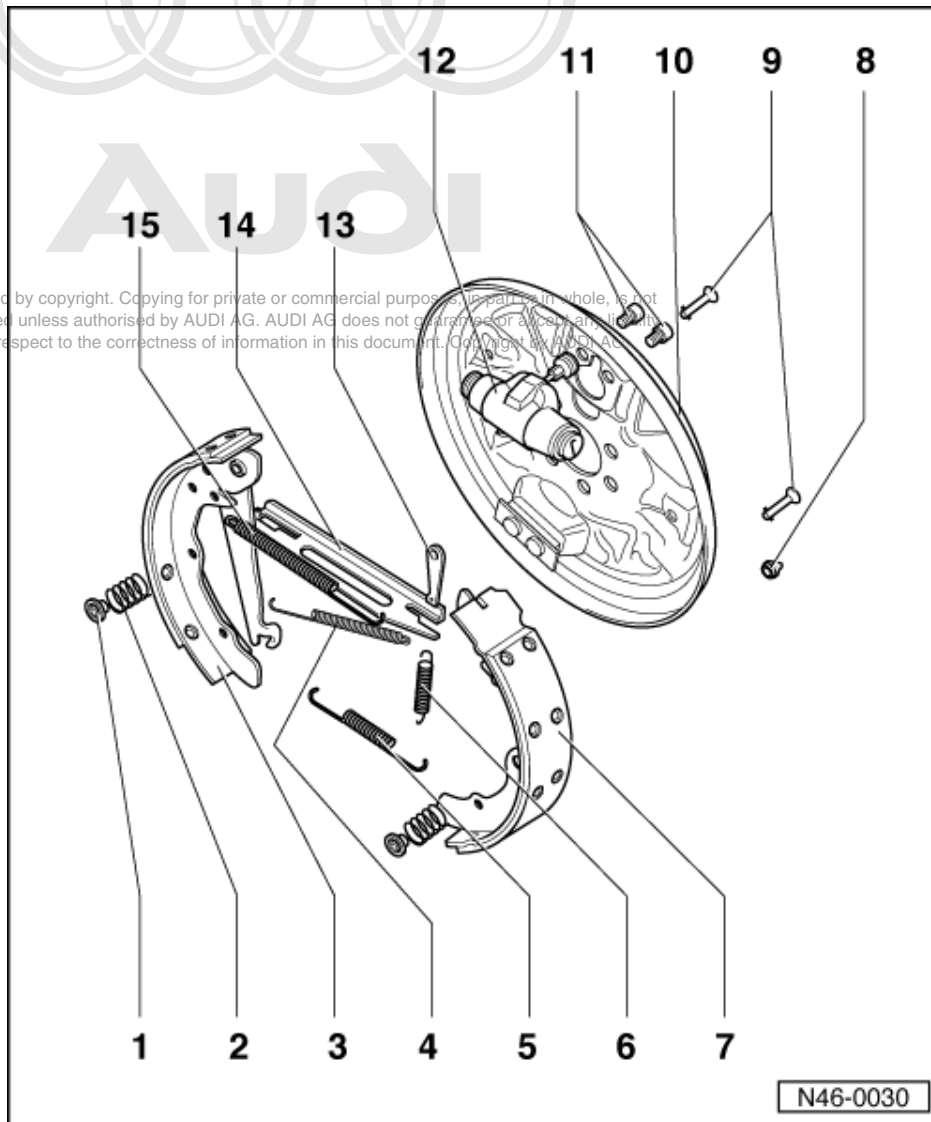
- ♦ Removing and installing
=>Page 80
- ♦ Minimum pad thickness 2.5 mm
- ♦ check thickness

=> Audi 100 1991; Maintenance

8 Cap

- ♦ Remove to check brake pad thickness

9 Spring pin



10 Brake backplate

11 Hexagon socket-head bolt,
10 Nm

12 Wheel-brake cylinder

- ♦ Leak test
=> Fig. 1

13 Key

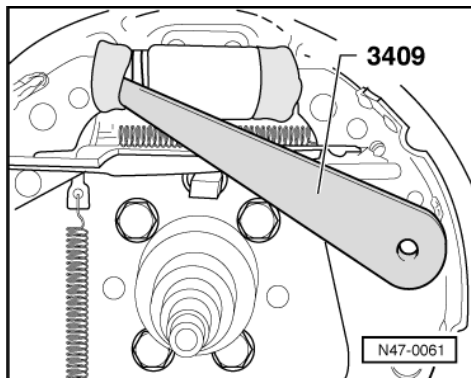
- ♦ To remove and install brake drum, press upwards through wheel-bolt hole=> Page 76

14 Push rod

- ♦ Grease contact points with lubricating paste, part- no. G 000 650

15 Locating spring

- ♦ Disengage with spring pincers



➔ Fig.1 Checking wheel-brake cylinder for leaks

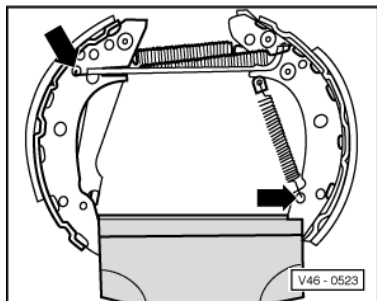
- Lift off dust sleeve
- Replace wheel-brake cylinder if brake fluid is found in dust sleeve.

Take care not to damage dust sleeve when lifting off.

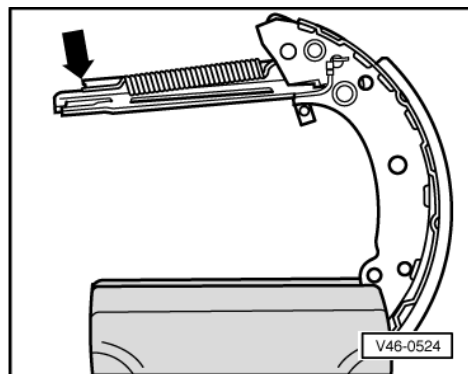
3.5 - Removing and installing brake shoes

Removing

- Reset brake => Page 76 .
- Pressing off grease cap => Page 75
- Removing brake drum.
- Removing spring plate.
- Disengage lower return spring.



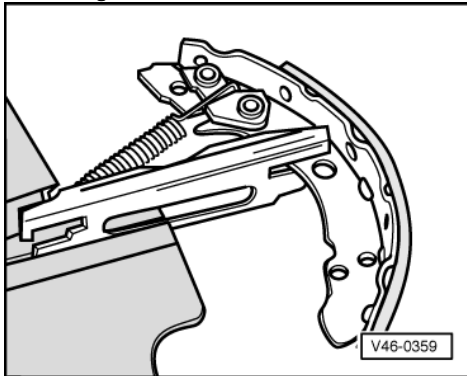
- Detach brake shoes.
- Disengage handbrake cable.
- Clamp brake shoes in vice.
- ➔ Remove tension spring for key.
- Removing upper return spring.



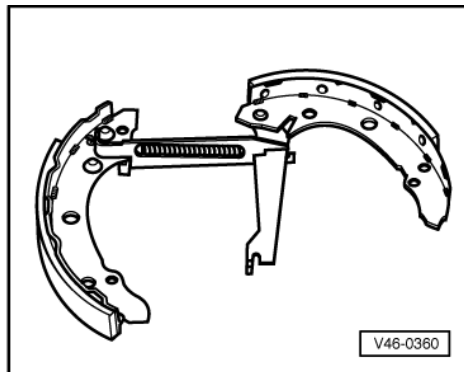
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- -> Disengage locating spring.

Installing



- -> Engage locating spring and position brake shoe on push rod.
- Fit key.

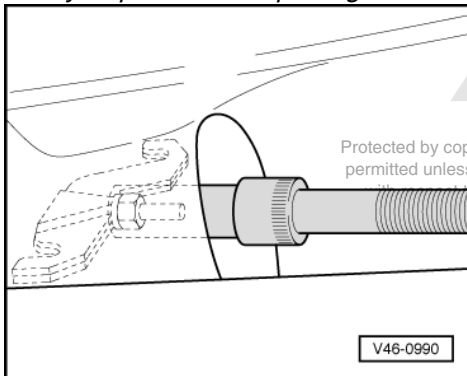


- -> Insert brake shoe with brake lever in push rod.
- Engaging upper return spring.
- Engage handbrake cable at brake lever.
- Position brake shoes on pistons of wheel-brake cylinder.
- Insert lower return spring and lift brake shoe onto lower support.
- Engage tension spring for key.
- Insert compression spring with spring plate.
- Install brake drum and insert wheel bearing play Adjusting wheel bearing play => Page 76
- Press foot brake firmly once to set rear brake.

3.6 - Adjusting handbrake

Note:

Due to the automatic rear wheel brake adjustment there is no requirement to adjust the handbrake. Resetting is only required after replacing handbrake cables, brake carriers or brake pads.



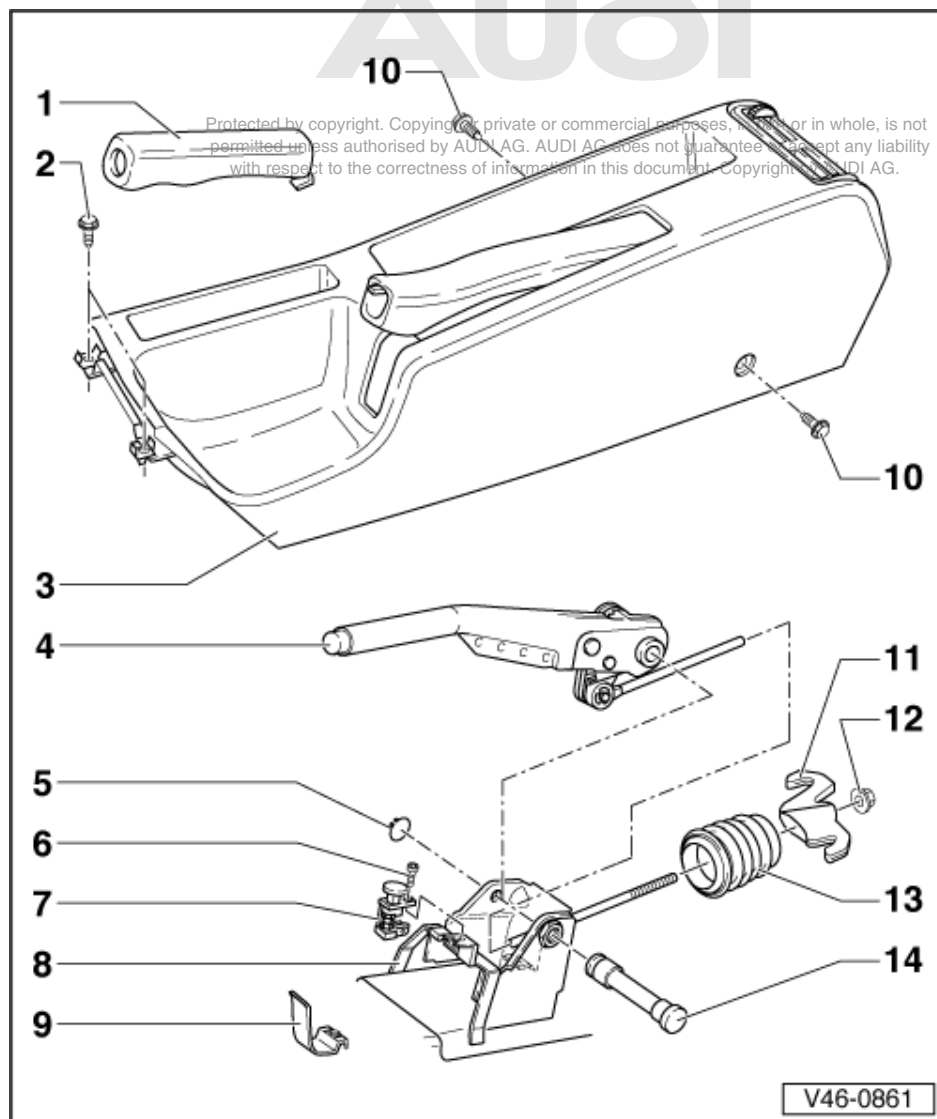
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- Release handbrake.
- Firmly press brake pedal once.
- Pull on handbrake lever 3 notches.
- -> Tighten adjusting nut -arrow- until both wheels are difficult to turn by hand.
- Release handbrake and check, whether both wheels can spin freely. If necessary, screw back adjusting nuts slightly.

4 - Handbrake lever - exploded view

4.1 - Handbrake lever - exploded view



Note:

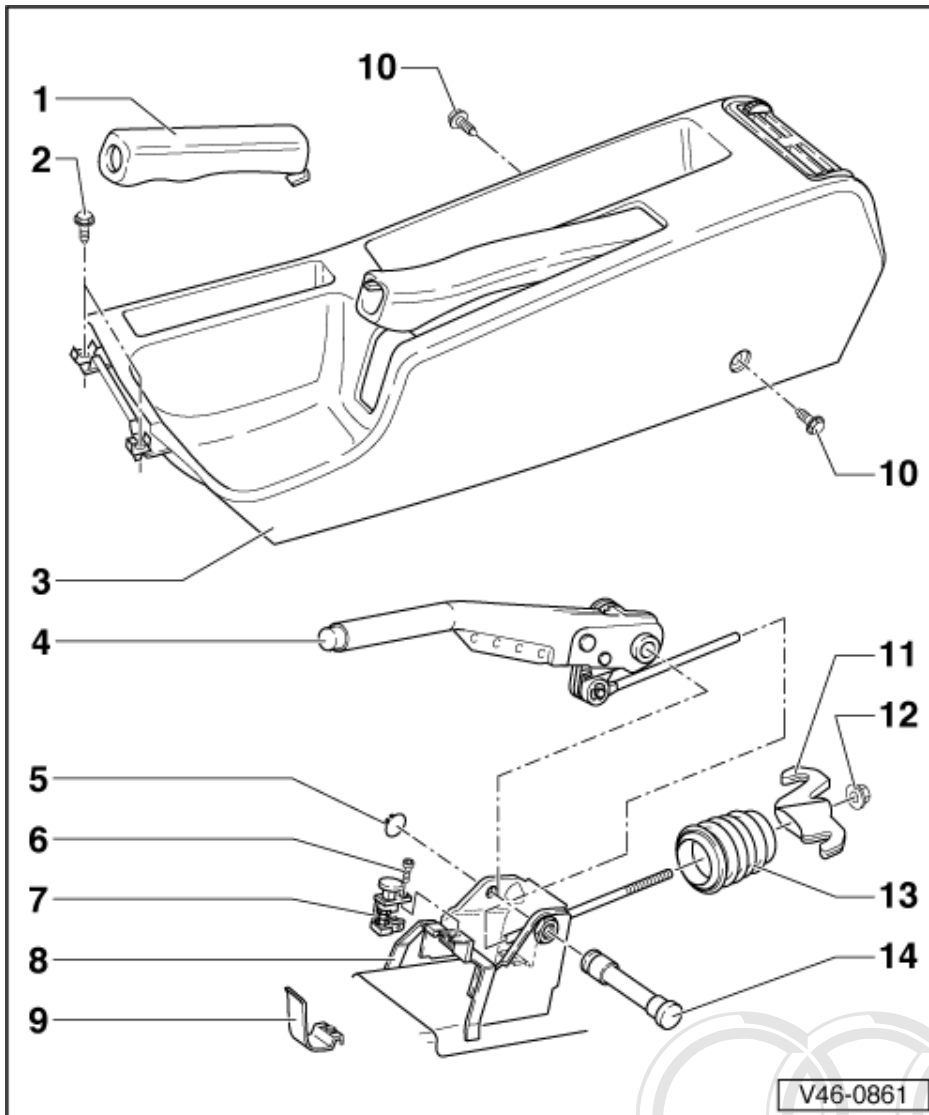
- ♦ On RHD vehicles, the handbrake lever is fitted flush with the right side of the centre console (flush with left side on LHD vehicles).
- ♦ Grease all bearing points prior to assembly with lithium grease, part no. N 052 738 00.

The following applies to both LHD and RHD vehicles.

1 Grip

- ♦ Slip onto handbrake lever
- ♦ Press home tab after assembly

- ♦ To dismantle, carefully press out tab with screwdriver



2 Bolt

3 Centre console

- ♦ Removing and installing

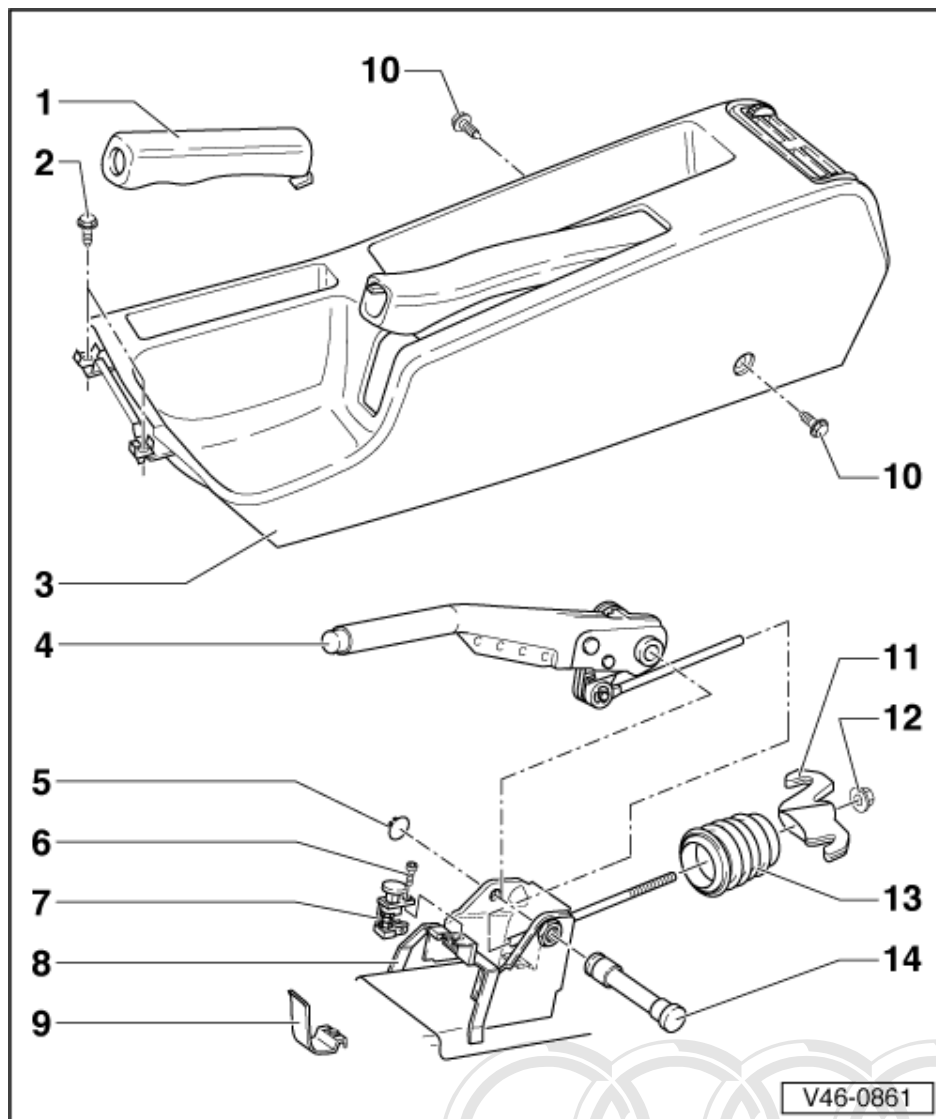
4 Handbrake lever

- ♦ Removing and installing
=> Page 85
- ♦ Available as assembly together with connecting rod, ratchet, push button, compression spring and locking segment
- ♦ Locking segment is also available as a separate replacement part

5 Circclip

- ♦ Replace
- ♦ Ensure correct positioning

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6 Bolt

7 Switch for handbrake controls

8 Mount for handbrake lever

9 Spring

10 Bolt

11 Compensator

- ◆ Installation position: Viewed in direction of travel, long side faces right

12 Adjusting nut

- ◆ Adjusting handbrake => Page 71

13 Bellows

- ◆ Ensure correct positioning

14 Fulcrum pin

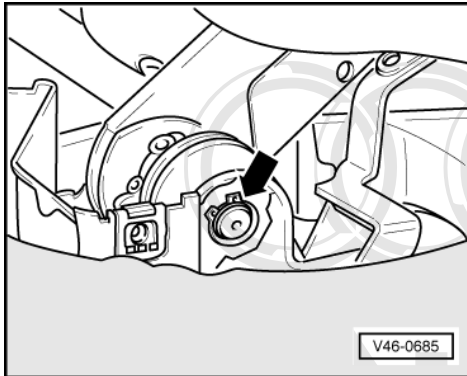
- ◆ For supporting handbrake lever

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4.2 - Removing and installing handbrake lever

Removing

- Removing centre console
- Remove rear exhaust on quattro vehicles.
- Removing centre heat-insulation panels.



- Unscrew adjusting nut from connecting rod.
- Detach compensator.
- Detach bellows.
- -> Disengage circlip - arrow - from pivot pin.
- Press out pivot pin.
- Push handbrake lever slightly to rear and take out.

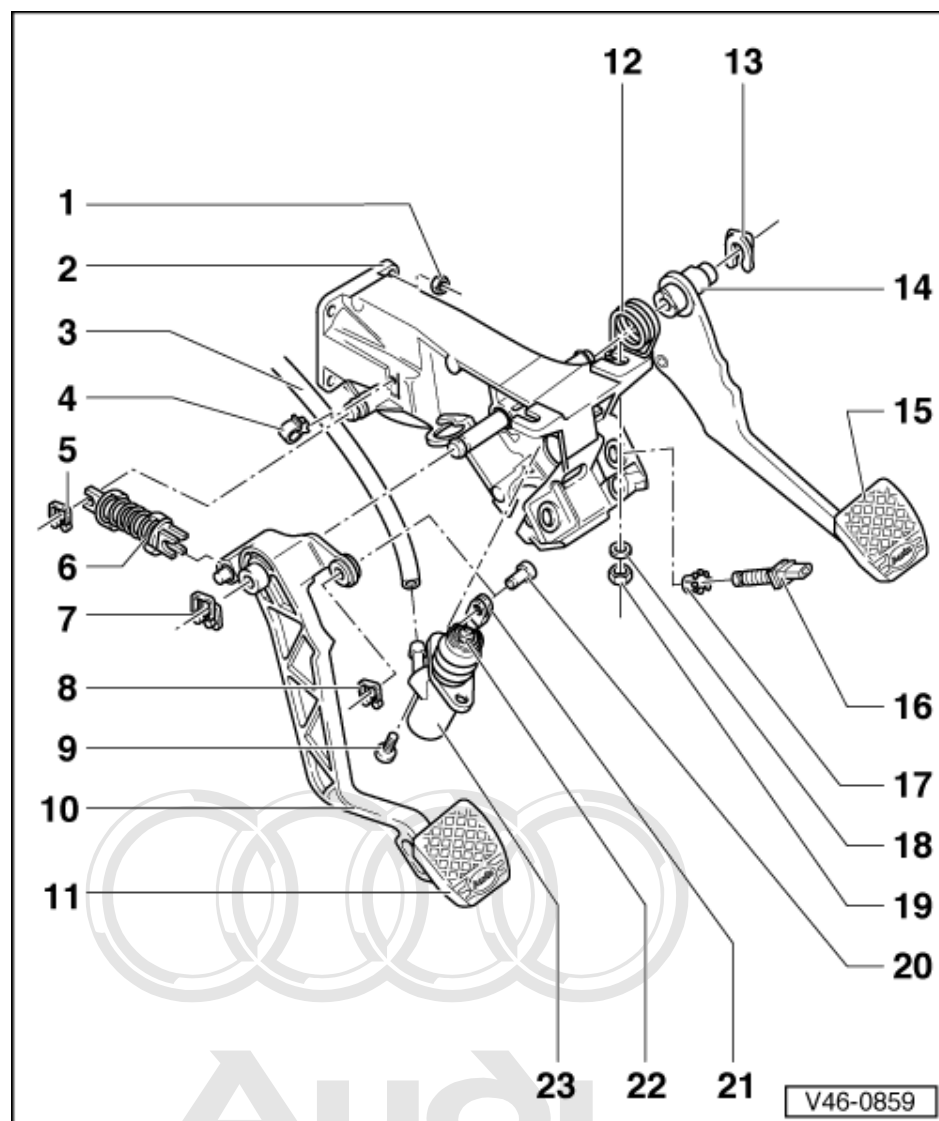
Install in reverse order.

Pay special attention to the following on installation:

- Insert circlip carefully.
- Insert bellows carefully.
- Ensure stress-free installation of exhaust system.
- Adjust handbrake (brake disc) => Page 71 .
- Adjust handbrake (brake drum) => Page 81 .

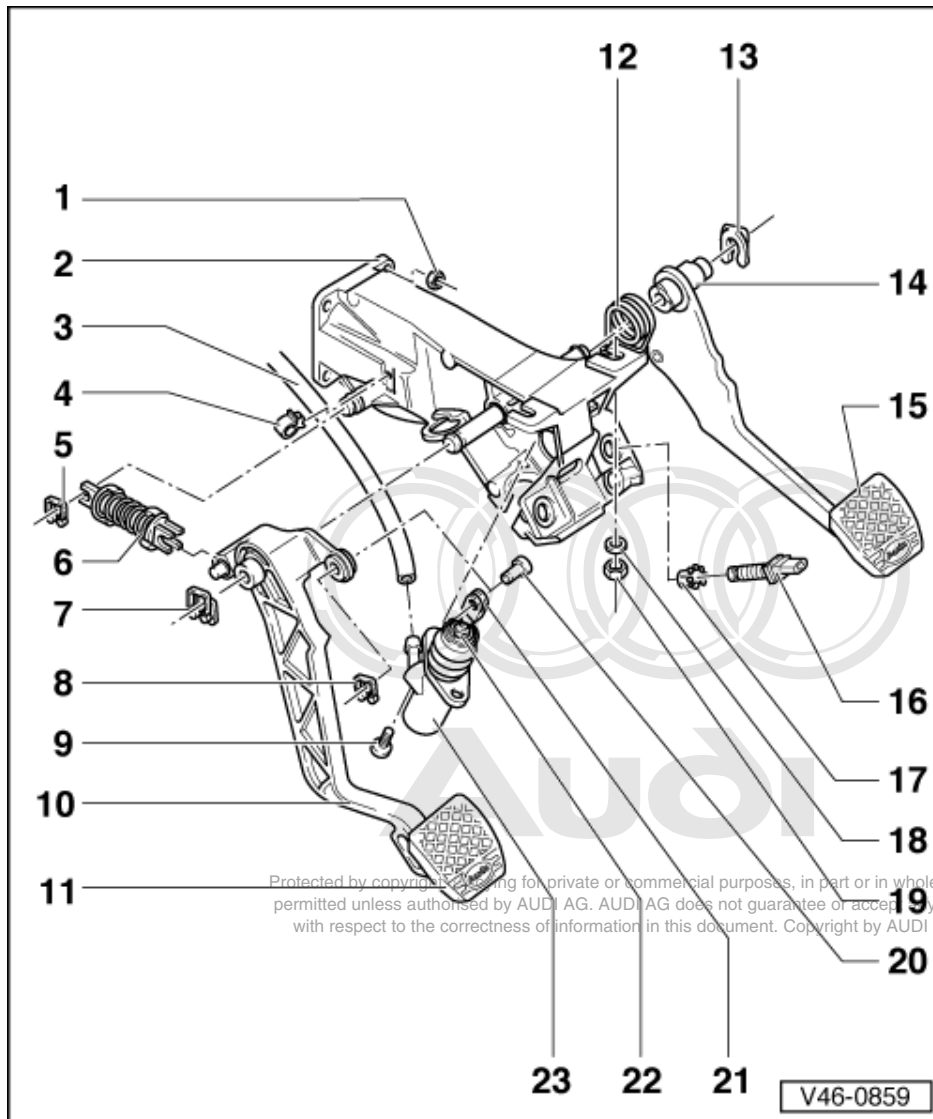
5 - Assembly overview: Brake pedal

5.1 - Assembly overview: Brake pedal

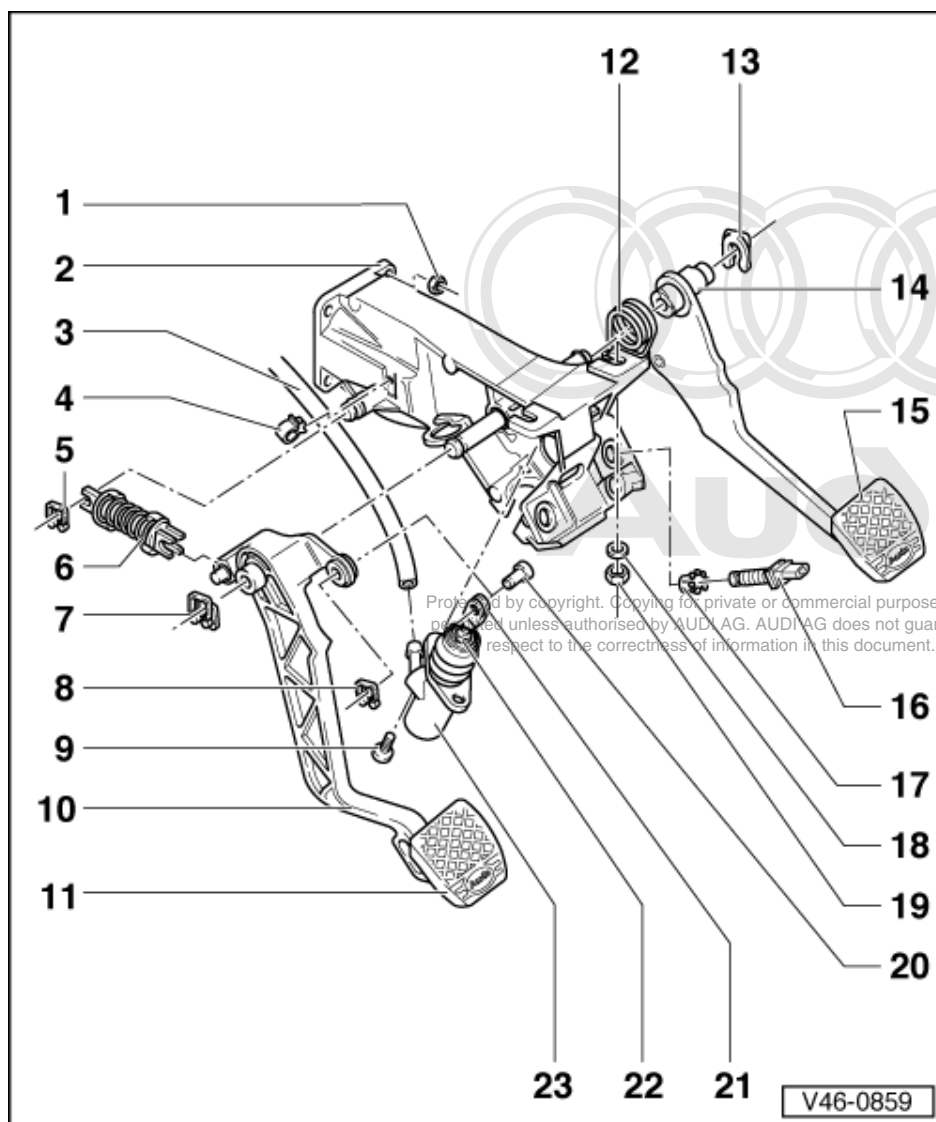


Warning!
The brake pedal travel must not be shortened by additional floor coverings.

- 1 Self-locking nut, 25 Nm
 - ◆ Renew each time after removing
- 2 Mounting
 - ◆ Disengage Procon cable on removal
- 3 Supply hose
 - ◆ Attach to master cylinder
- 4 Clip
 - ◆ Insert in mounting bracket



- 5 Locking clip
 - ♦ Renew each time after removing
 - ♦ Fit onto pin
- 6 Over-centre spring
 - ♦ Removing and installing
=> Fig. 2
- 7 Locking clip
 - ♦ Renew each time after removing
 - ♦ Attach to shaft of mounting bracket
- 8 Locking clip
 - ♦ Renew each time after removing
 - ♦ Fit onto pin
- 9 Cheese head bolts, 20 Nm
 - ♦ Screw master cylinder to pedal bracket



10 Clutch pedal

- ◆ Located in position by clutch master cylinder adjustment
- ◆ Slip onto shaft of mounting bracket
- ◆ Replacement part supplied with moulded mounting bush which cannot be replaced

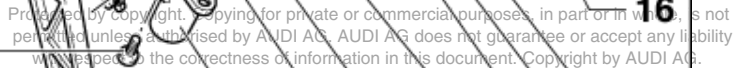
11 Cap

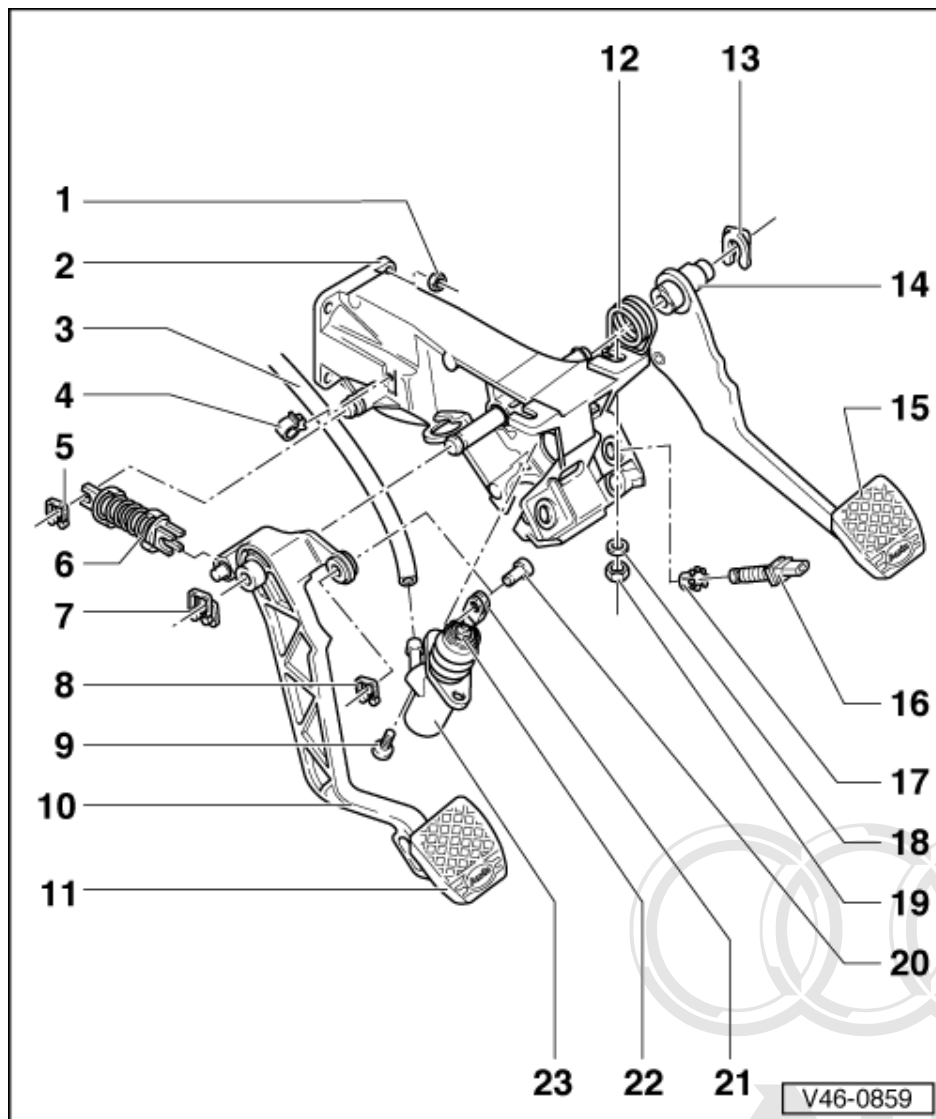
12 Rear spring for brake pedal

- ◆ Installation position: Long arm in mounting bracket and short arm in brake pedal

13 Locking clip

- ◆ Renew each time after removing
- ◆ Attach to shaft of mounting bracket





18 Washer

19 Self-locking nut, 25 Nm

- ♦ Renew each time after removing

20 Pin

- ♦ Insert in clutch pedal and master cylinder

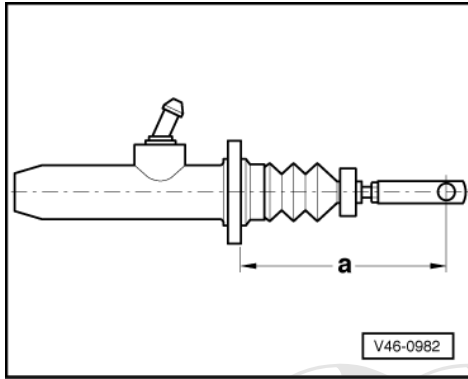
21 Fork

22 Lock nut, 50 Nm

23 Master cylinder

- ♦ Replace in the event of leakage
- ♦ Adjusting => Fig. 1

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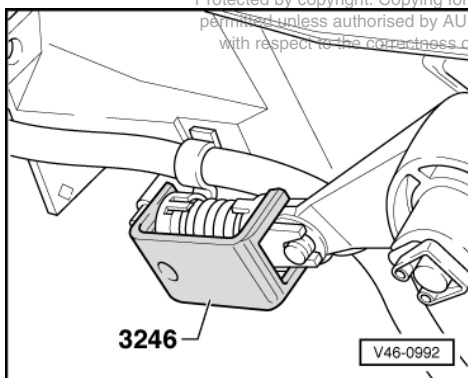
-> Fig.1 Adjusting clutch master cylinder

$a = 109.5\text{mm} \pm 0.5\text{mm}$

- Turn fork to adjust.

Note:

- ♦ When measuring, fork must be at right angles to contact surface of clutch master cylinder.
- ♦ If clutch pedal does not reset automatically with fork correctly set, this may be due to:
 - Air in hydraulic system



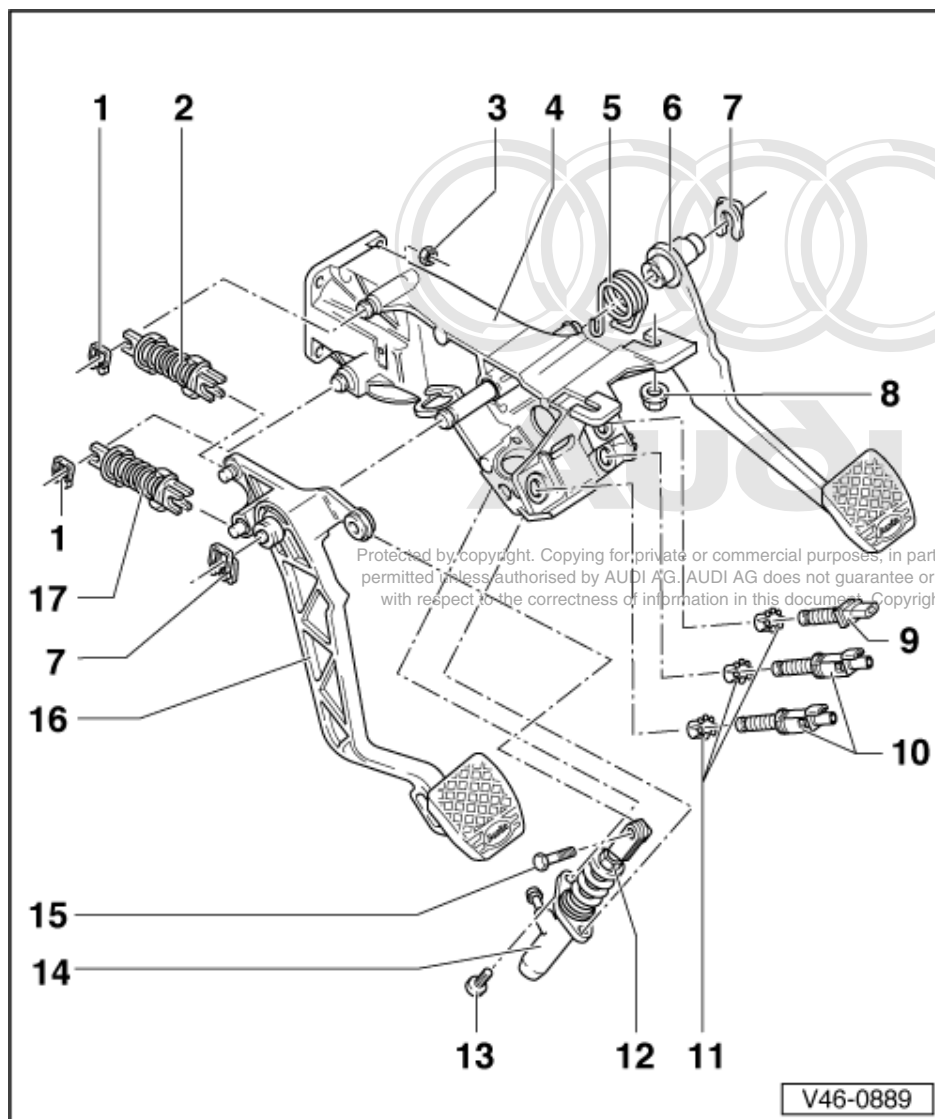
- Pedal not moving freely in mount.

-> Fig.2 Removing and installing over-centre spring

- Detach fastener from pivot pin.
- Tension over-centre spring with clutch pedal and press on retaining clamp 3246.
- Detach over-centre spring together with assembly clamp 3246.

6 - Assembly overview: Brake pedal, Audi S4/S6

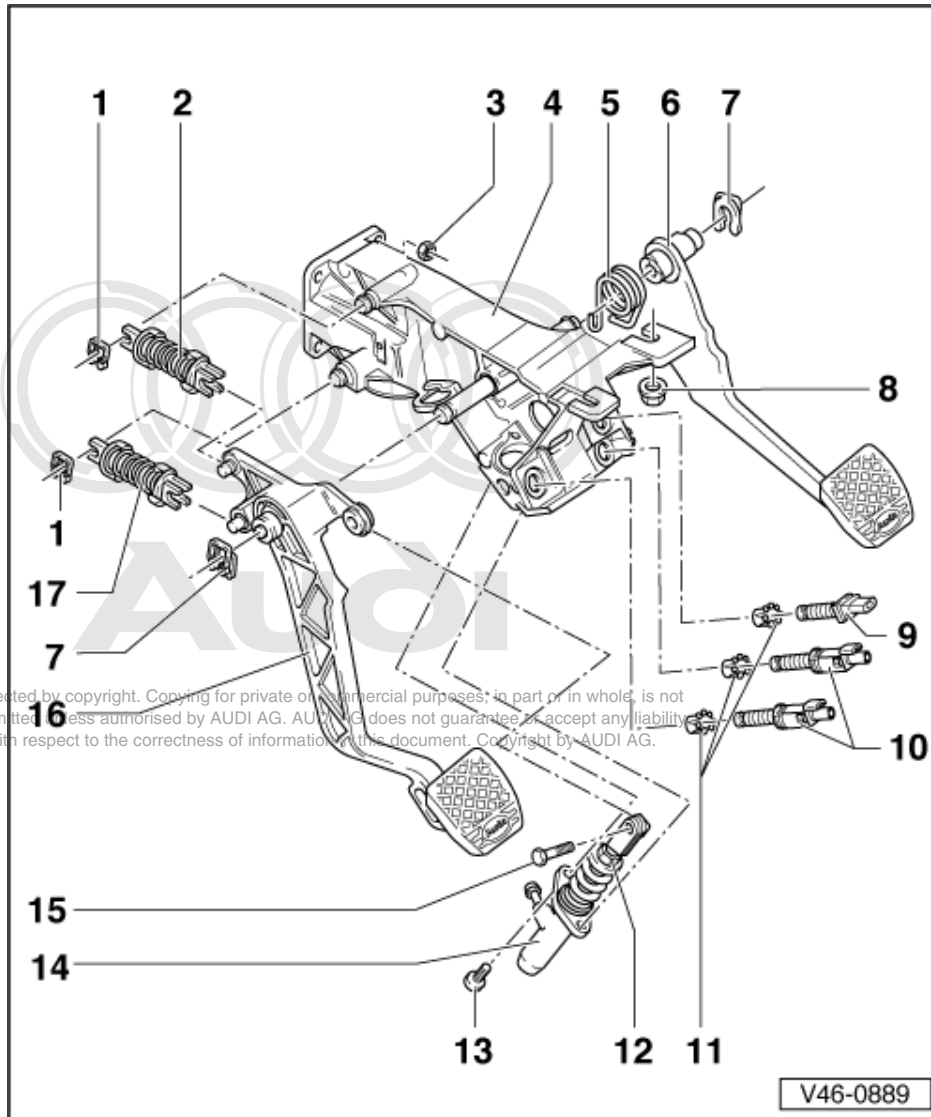
6.1 - Assembly overview: Brake pedal, Audi S4/S6



Warning!

The brake pedal travel must not be shortened by additional floor coverings.

- 1 Locking clip**
 - ◆ Renew each time after removing
 - ◆ Fit onto pin
- 2 Over-centre spring**
 - ◆ Green marking
 - ◆ Removing and installing
=> Fig. 2
- 3 Self-locking nut, 25 Nm**
 - ◆ Renew each time after removing



4 Mounting

- ♦ Disengage Procon cable on removal

5 Rear spring for brake pedal

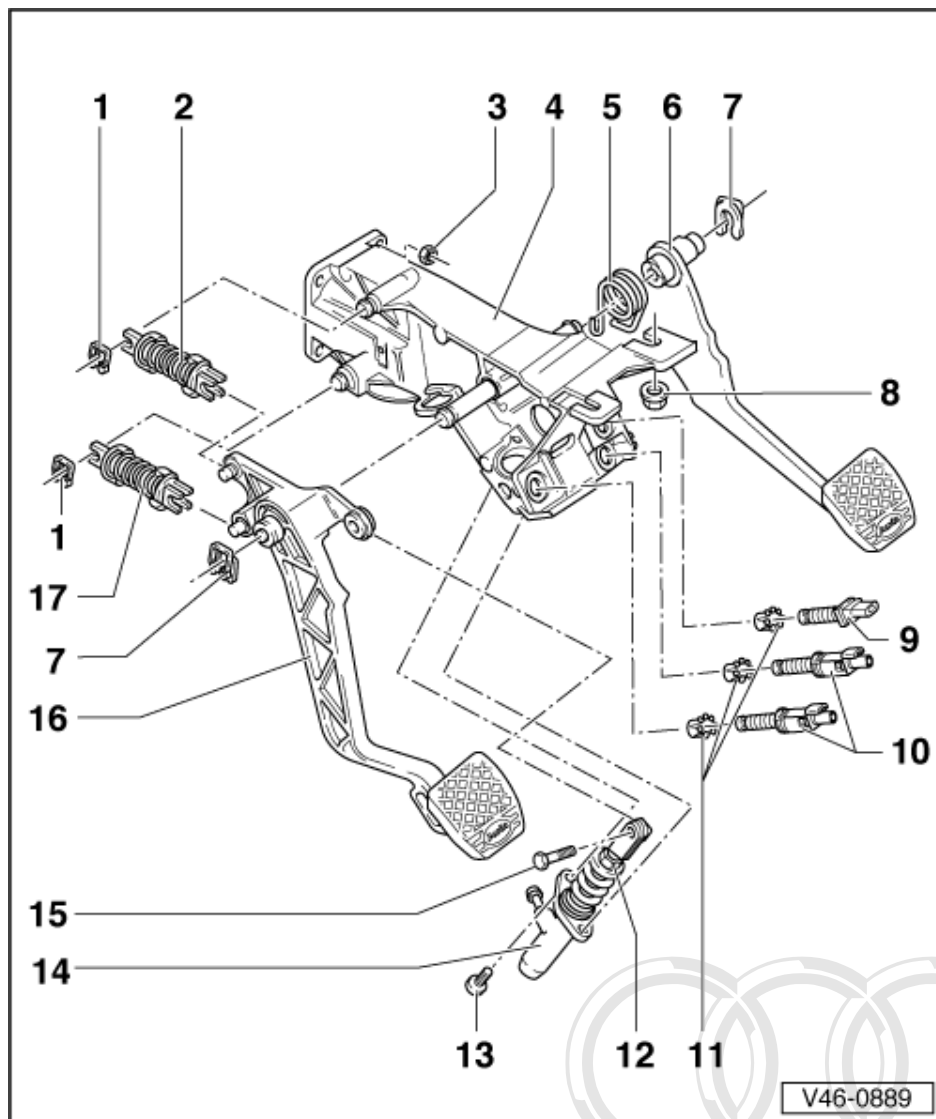
- ♦ Installation position: Long arm in mounting bracket and short arm in brake pedal

6 Brake pedal

- ♦ Slip onto shaft of mounting bracket
- ♦ Replacement part supplied with moulded mounting bush which cannot be replaced
- ♦ To remove and install, remove mounting bracket

7 Locking clip

- ♦ Renew each time after removing
- ♦ Attach to shaft of mounting bracket



8 Nut, 25 Nm

9 Brake light switch

- ◆ Adjusting:
 - Brake pedal operated
 - Press in brake light switch as far as it will go
 - Pull back brake pedal as far as it will go

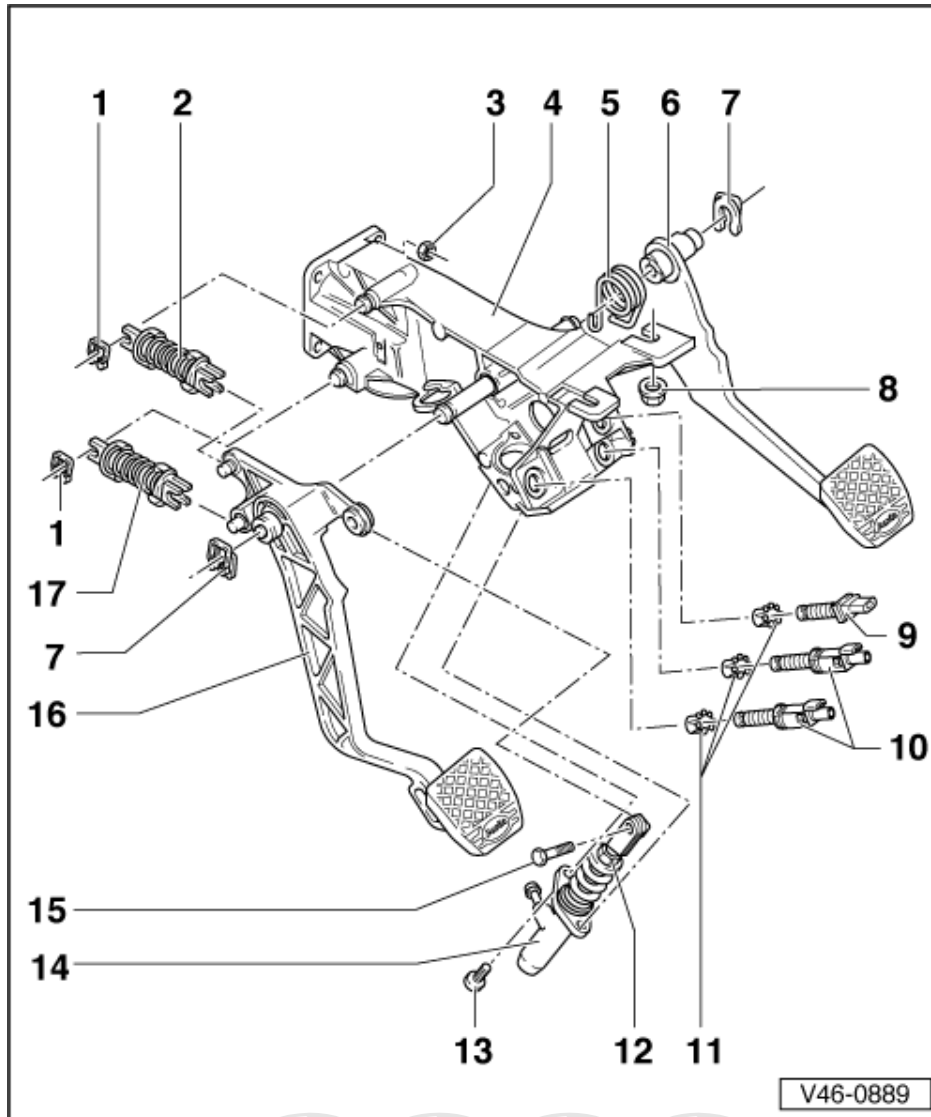
10 Vent valves

- ◆ Adjusting:
 - Operating brake and clutch pedals
 - Press in vent valve as far as it will go
 - Pull back brake and clutch pedal as far as they will go

11 Clip

- ◆ Renew each time after removing
- ◆ Insert in mounting bracket

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12 Hexagon nut 10 Nm

13 Cheese head bolts, 20 Nm

14 Master cylinder

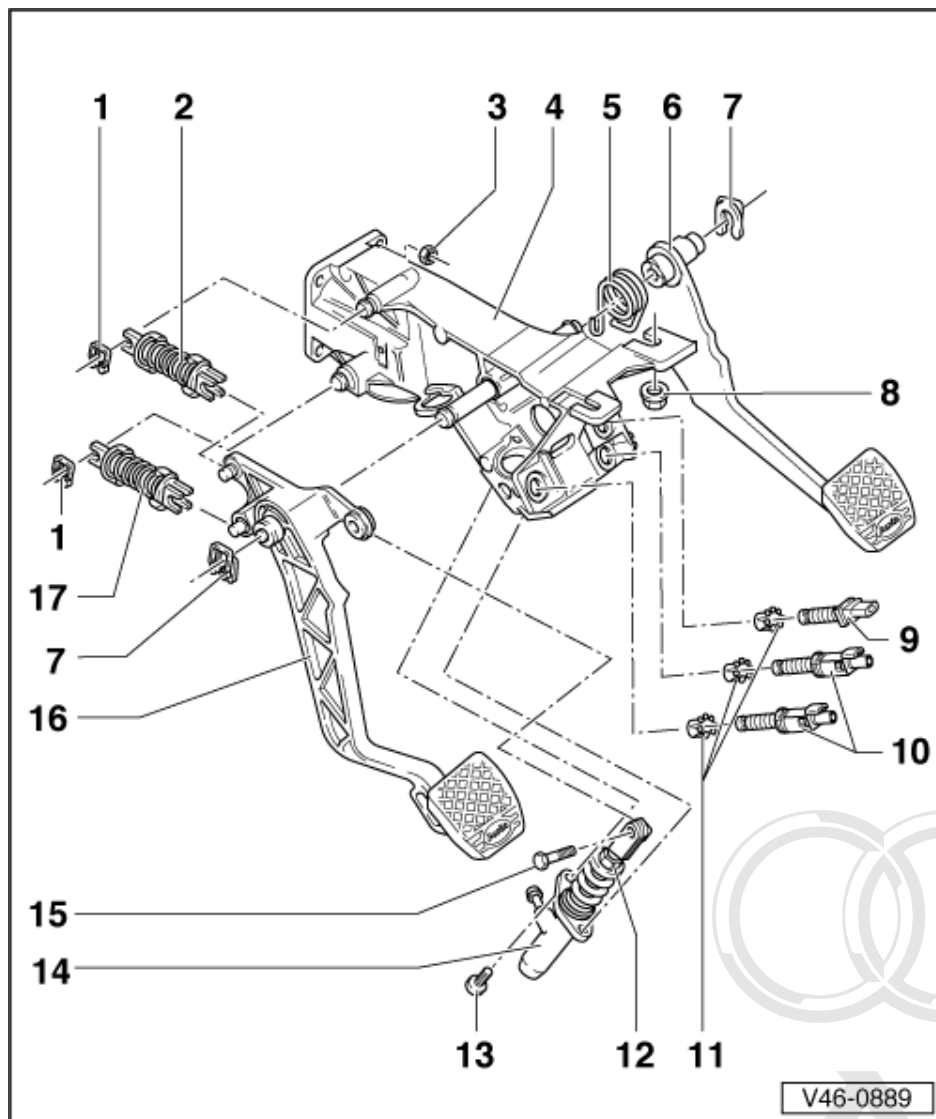
- ♦ Replace in the event of leakage
- ♦ Adjusting => Fig. 1

15 Hexagon bolt, 20 Nm

16 Clutch pedal

- ♦ Located in position by clutch master cylinder adjustment
- ♦ Slip onto shaft of mounting bracket
- Removal and installation do not involve taking out mounting bracket.
- To do so, remove shelf on left beneath dash panel.
- Removing Footwell vents, central electrics, relay carriers and cover for central electrics => Fig.3

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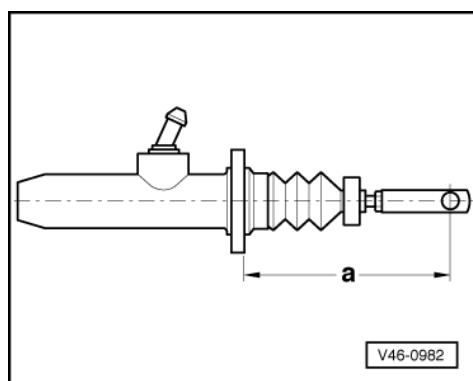


- ♦ Removing over-centre spring => Fig 2.
- ♦ Replacement part supplied with moulded mounting bush which cannot be replaced

17 Over-centre spring

- ♦ Yellow marking
- ♦ Removing and installing
=> Fig. 2

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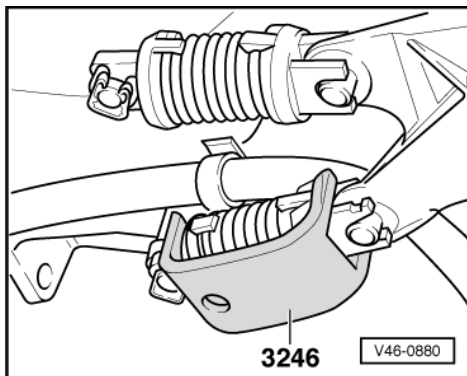
➔ Fig.1 Adjusting clutch master cylinder

$a = 109.5\text{mm} \pm 0.5\text{mm}$

- Turn fork to adjust.

Note:

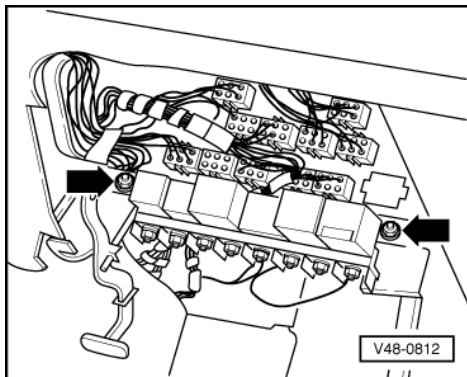
- ♦ When measuring, fork must be at right angles to contact surface of clutch master cylinder.
- ♦ If clutch pedal does not reset automatically with fork correctly set, this may be due to:
 - Interchanged over-centre springs
 - Air in hydraulic system



- Pedal not moving freely in mount.

➔ Fig.2 Removing and installing over-centre spring

- Remove the lower of both over-centre springs.
- Detach fastener from pivot pin.
- Tension over-centre spring with clutch pedal and press on retaining clamp 3246.
- Detach over-centre spring together with assembly clamp 3246.



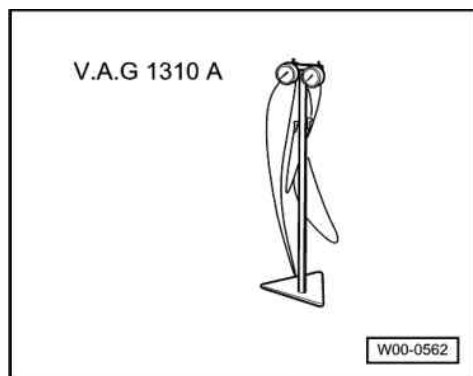
➔ Fig.3 Unscrewing central electrics and relay carrier

47 - Brakes, Brake hydraulics

1 - Pressurised leak test

1.1 - Pressurised leak test

Special tools and workshop equipment required



- ♦ V.A.G 1310 A Braking-system tester

Test requirements:

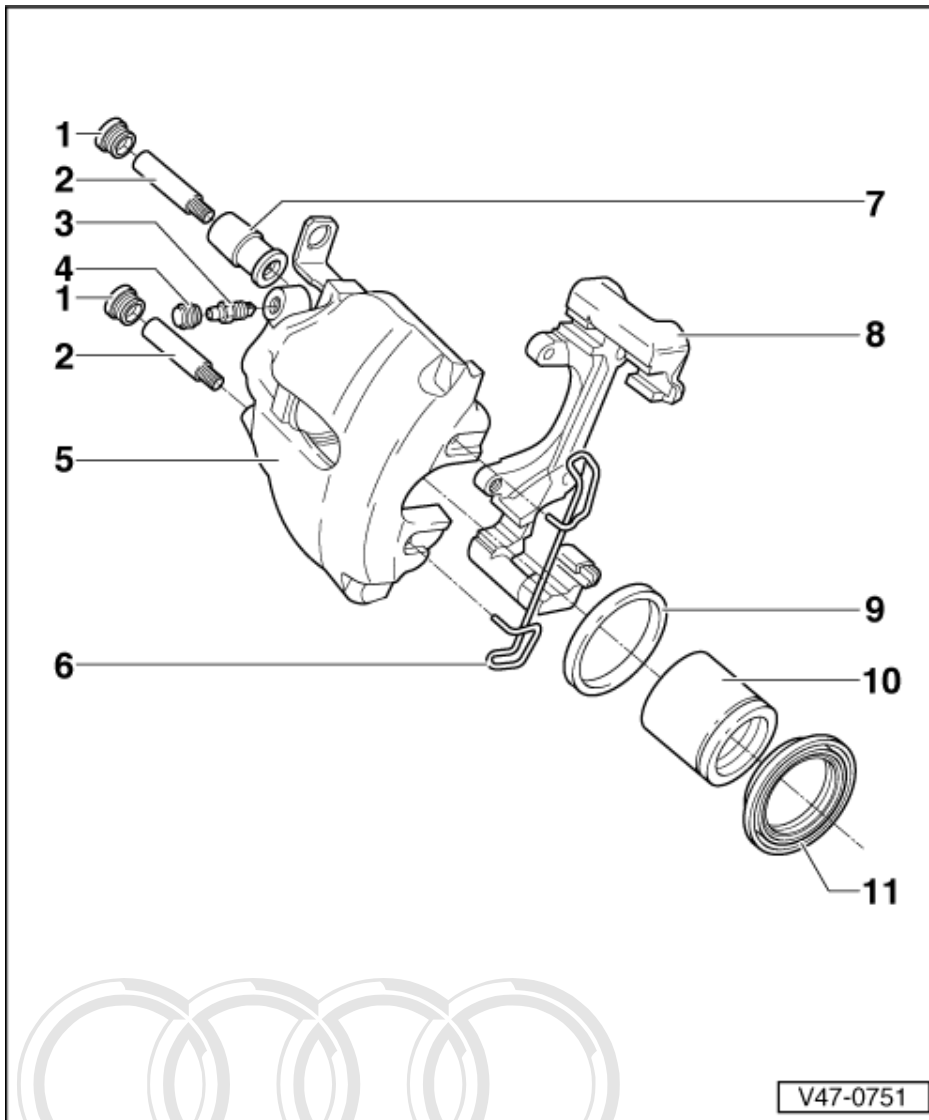
Make sure that the brake system (hydraulic unit, brake hoses, brake pipes and brake calipers) works properly and is free of leaks.

- Remove bleeder screw at one of the front brake calipers. Connect pressure gauge of V.A.G 1310 A and bleed system.
- Insert brake pedal depressor between brake pedal and driver's seat. Apply pressure to brake pedal until the gauge indicates a pressure of 50 bar. The pressure must not drop by more than 4 bar during the test period of 45 seconds. Replace brake master if drop in pressure exceeds the above figure.

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2 - Servicing Teves/Ate front brake calipers

2.1 - Servicing Teves/Ate front brake calipers



Note:

- ◆ When carrying out repairs install all parts supplied in repair kit.
- ◆ New brake calipers are filled with brake fluid and are pre-bled.
- ◆ Apply thin coat of fitting paste G 052 150 A2 to brake cylinders, pistons and seals.

1 Caps

- ◆ Insert into bearing bush

2 Guide pin, 25 Nm

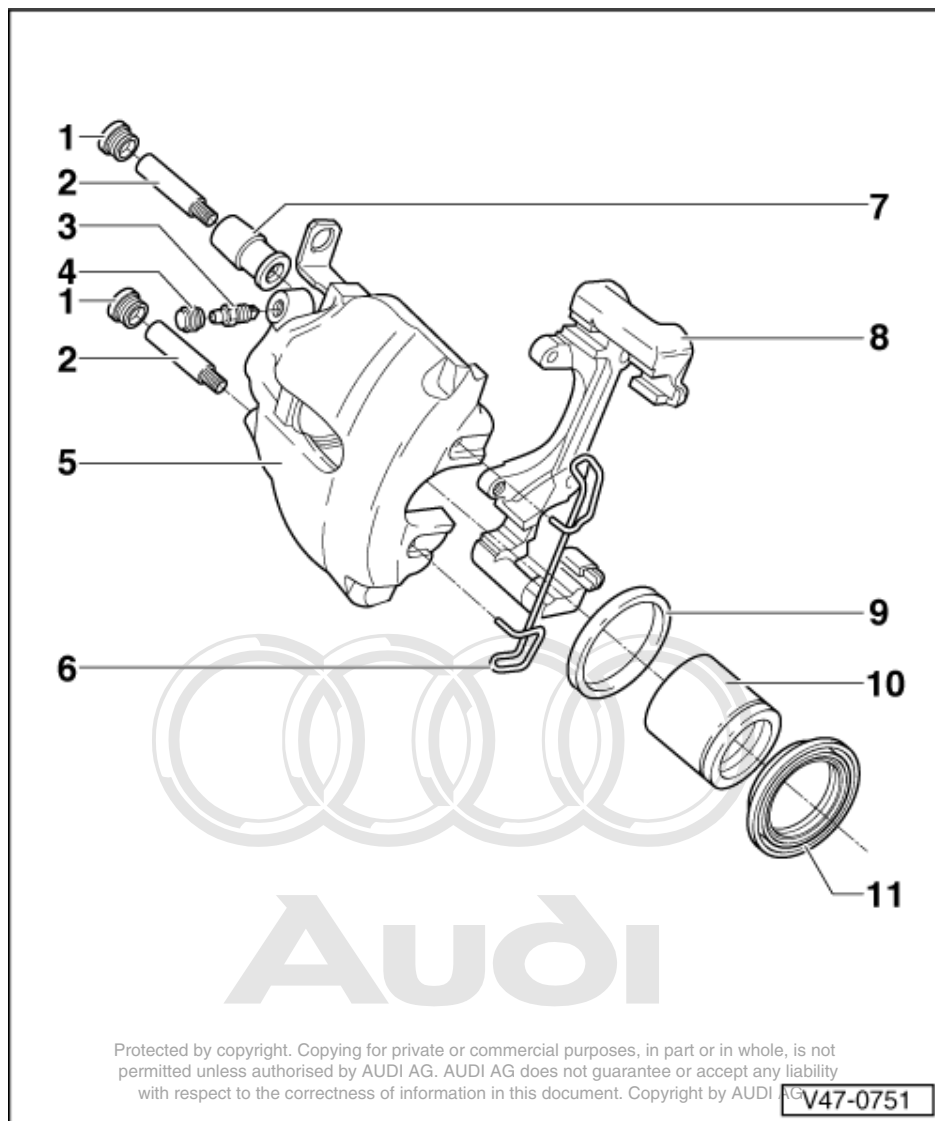
3 Vent valve

- ◆ Apply thin coat of assembly paste G 052 150 A2 to thread before screwing in

4 End cap

- ◆ Fit onto bleeder valve

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V47-0751

5 Brake caliper housing

6 Retention spring

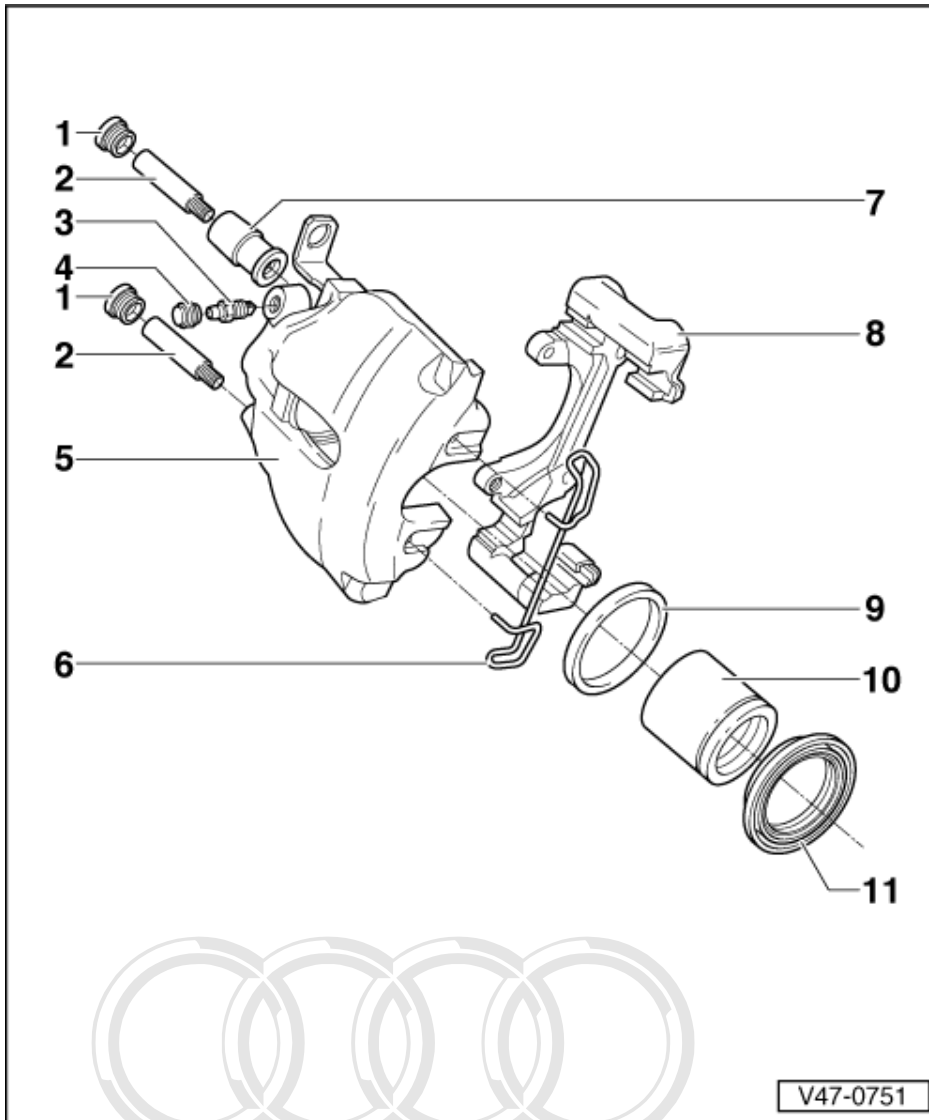
- ◆ Insert both ends into the holes in the brake caliper housing

Note:

After inserting the retaining spring into both holes, it has to be pressed below the brake carrier. If incorrectly installed, it is not possible to adjust the wear of the outer pad and the pedal travel will be increased as a result.

7 Bush

- ◆ Insert into brake caliper housing



8 Brake backplate

- ◆ Bolt to brake caliper housing

9 Oil seal

- ◆ Removing and installing => Page **102**

10 Piston

- ◆ Apply thin coat of assembly paste G 052 150 A2 to piston before inserting
- ◆ Piston diameter 57 mm

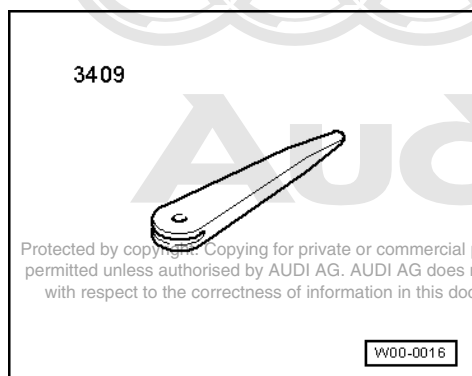
11 End cap

- ◆ Do not damage when inserting piston

V47-0751

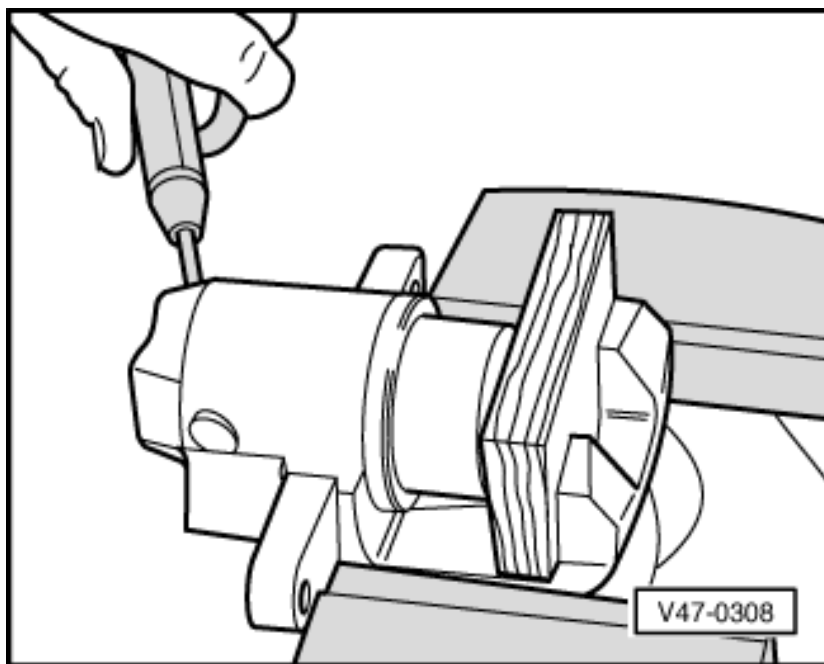


2.2 - Removing and installing piston for front brake caliper



Special tools and workshop equipment required

- ♦ 3409 Assembly wedge
- ♦ Piston resetting tool

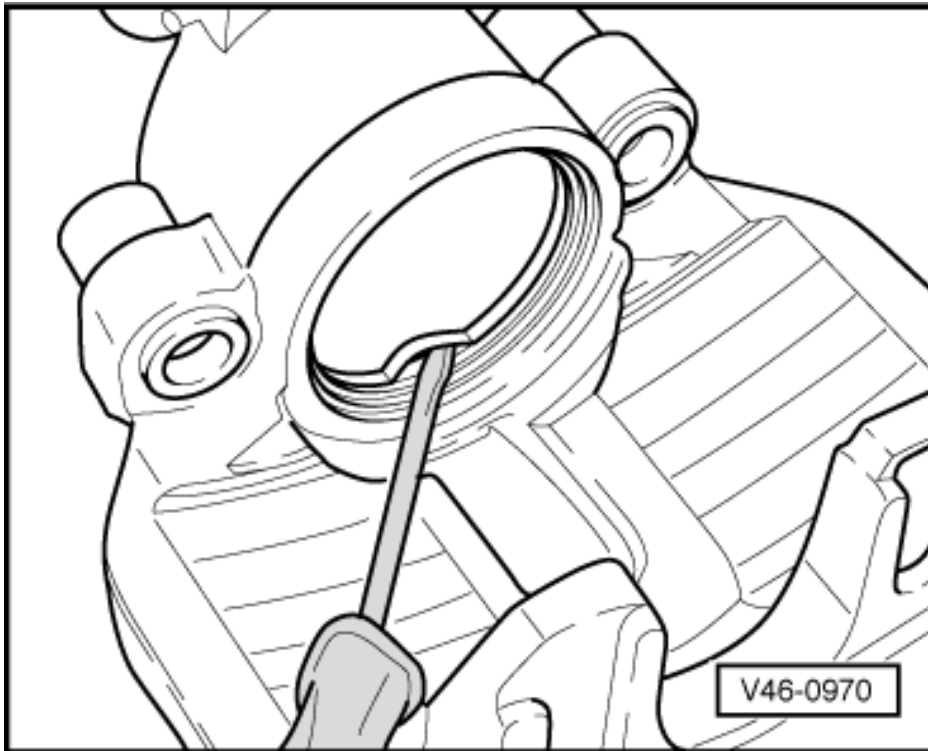


Removing

- -> Force piston out of brake caliper housing using compressed air.

Note:

Place a piece of wood in the recess to prevent damaging the piston.



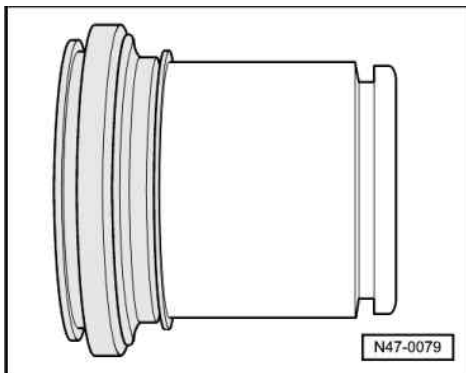
- -> Remove seal using assembly wedge 3409.

Note:

Ensure that the surface of the cylinder is not damaged during removal.

Installing

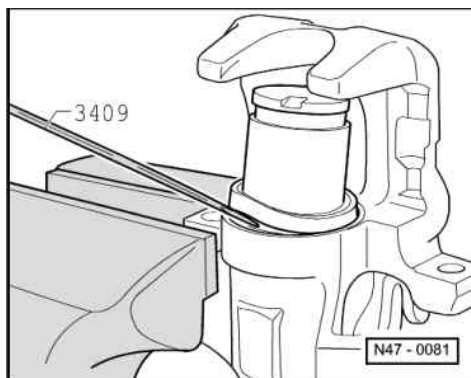
- The surface of the piston and seal should be cleaned using only methylated spirits and then dried.
- Thinly coat piston and seal with assembly paste G 052 150 A2 before inserting.



- -> Place protective seal with outer sealing lip on the piston



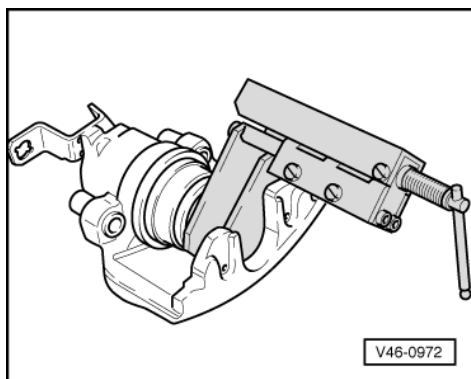
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- -> Using removal wedge 3409, insert inner sealing lip into the groove on the cylinder.

Note:

Hold piston in front of brake caliper housing.



- -> Press piston into the brake caliper housing using piston resetting tool.

Note:

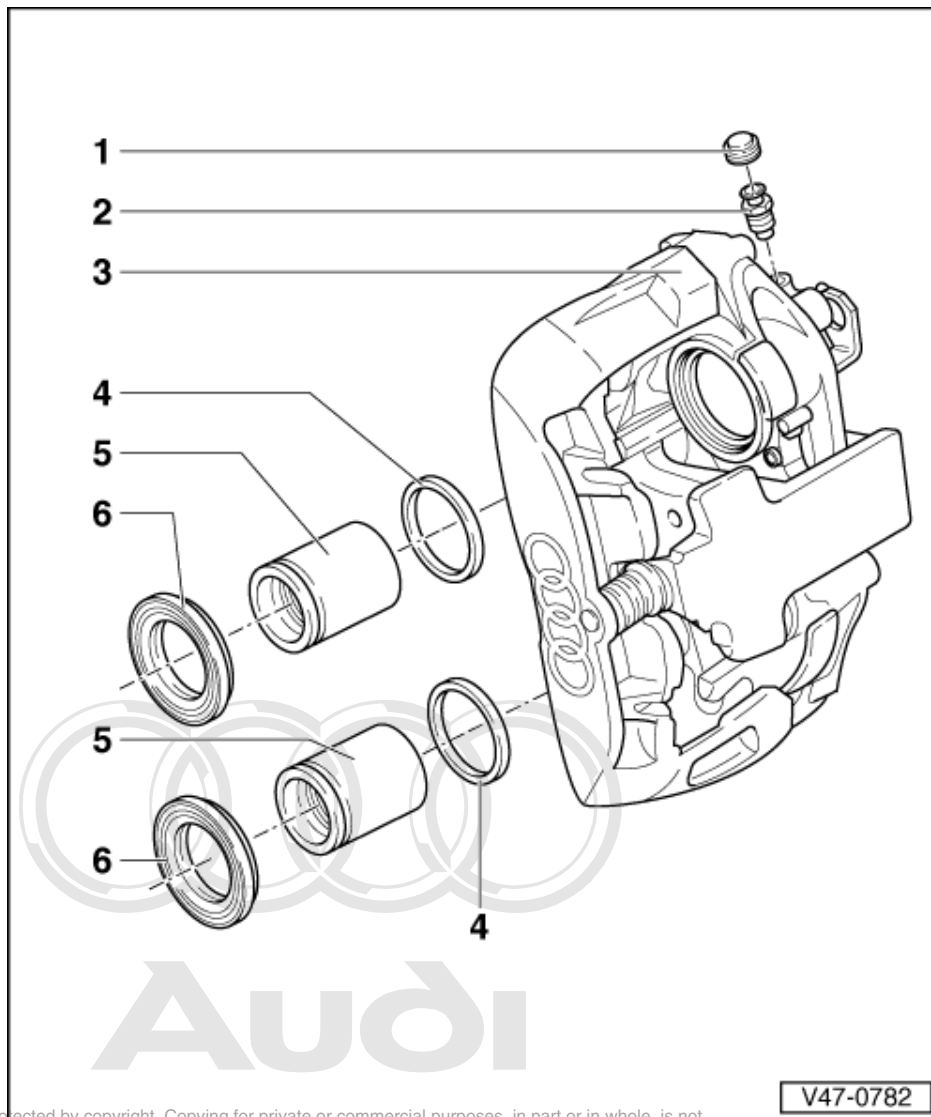
The protective seal outer sealing lip will then locate in the piston groove.



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3 - Servicing front brake caliper, two-piston brake caliper

3.1 - Servicing front brake caliper, two-piston brake caliper



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Audi S4/S6

Note:

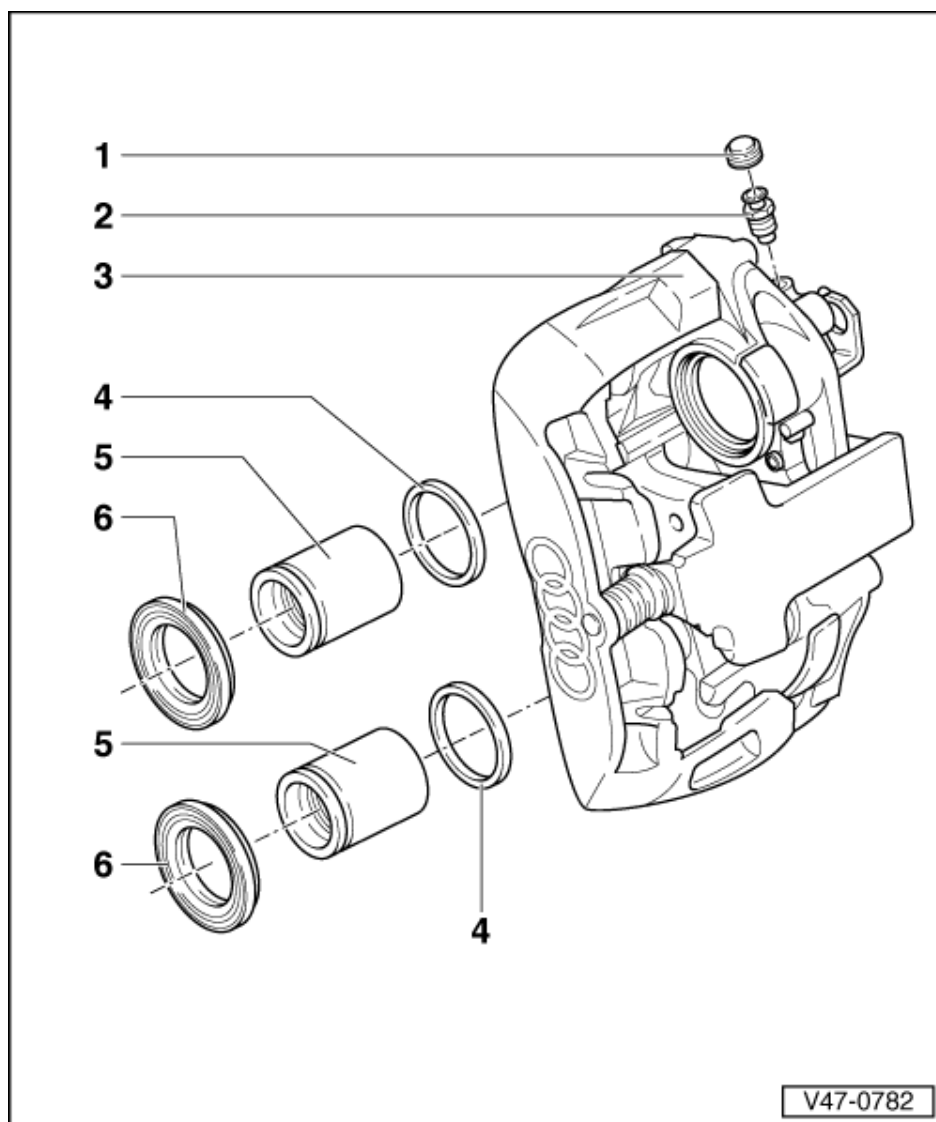
- ◆ When carrying out repairs install all parts supplied in repair kit.
- ◆ New brake calipers are filled with brake fluid and are pre-bled.
- ◆ Apply thin coat of fitting paste G 052 150 A2 to brake cylinders, pistons and seals.

1 End cap

- ◆ Fit onto bleeder valve

2 Vent valve

- ◆ Apply thin coat of assembly paste G 052 150 A2 to thread before screwing in



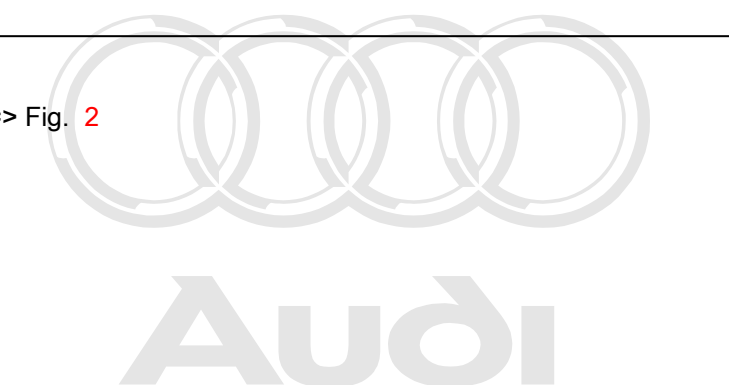
3 Brake caliper housing

Warning!

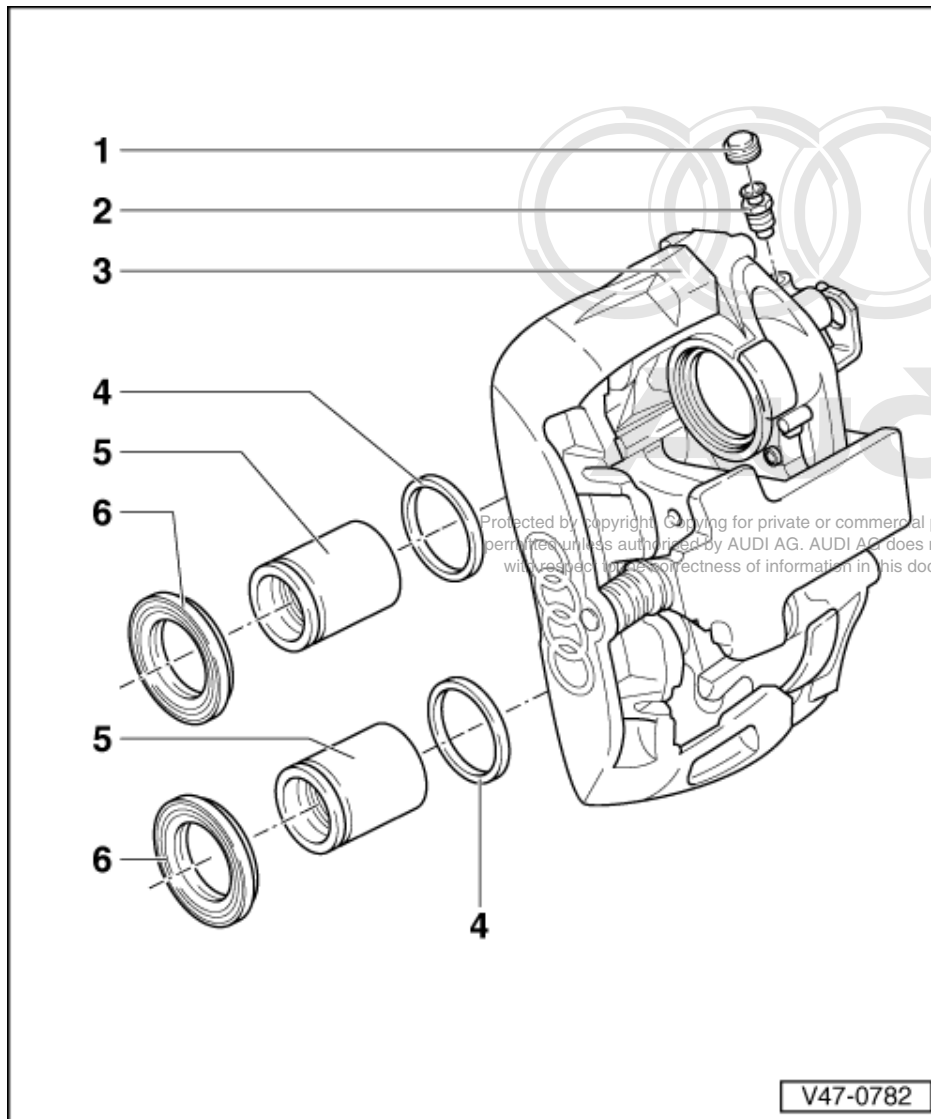
Do not separate the two halves of the housing (internally serrated screws). Replace brake caliper if protective cap for guide pins is damaged.

4 Seals

- ◆ Use assembly wedge -3409- to remove => Fig. 2
- ◆ Insert carefully by hand



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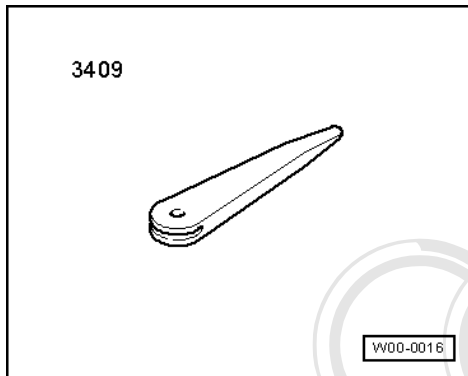
5 Piston

- ◆ Piston diameter 42.8 mm
- ◆ Use compressed air to press out of brake caliper housing => Fig. 1
- ◆ Apply thin coat of assembly paste G 052 150 A2 to piston before inserting
- ◆ Installing => Fig. 3, 4, and 5

6 Protective caps

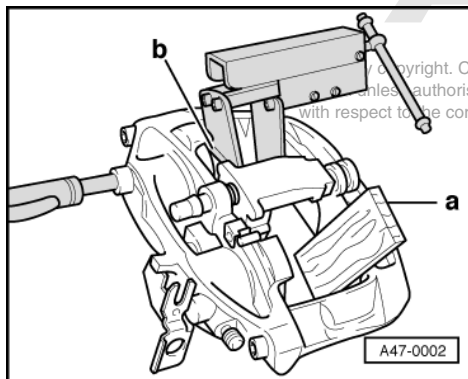
- ◆ Do not damage when inserting piston
- ◆ Fit onto piston with outer sealing lip => Fig. 3
- ◆ Insert with inner sealing lip in groove in brake caliper housing => Fig. 4

3.2 - Removing and installing piston for front brake caliper



Special tools, testers and workshop equipment required

- ♦ 3409 Assembly wedge
- ♦ Piston resetting tool

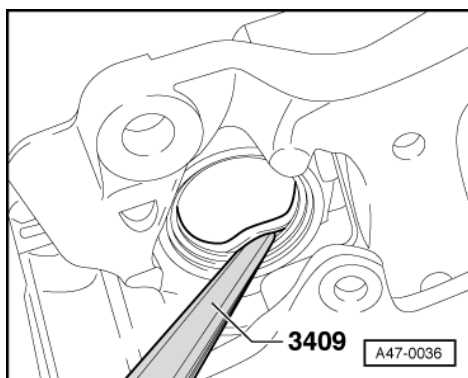


-> Fig.1 Using compressed air to press pistons individually out of brake caliper housing

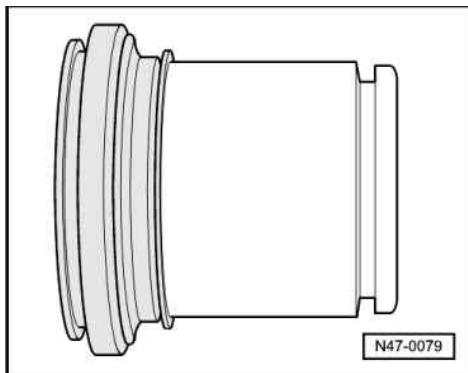
Note:

Insert brake pad -b- into the piston. Position wooden block -a- in recess to avoid piston damage.

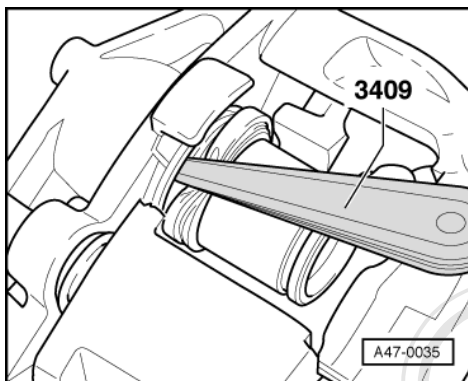
Only one piston can be pressed out at a time, when doing so, hold other piston in position in brake caliper housing using piston resetting tool.



-> Fig.2 Remove seal using assembly wedge 3409



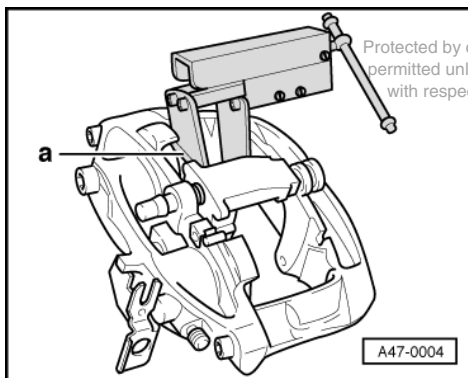
-> Fig.3 Pulling on protective cap with outer sealing lip over piston



-> Fig.4 Inserting inner sealing lip of protective cap with wedge 3409

Note:

Hold piston in front of brake caliper housing.



-> Fig.5 Press piston into the brake caliper housing using piston resetting tool.

- Insert piston by hand.
- Insert brake pad -a-.

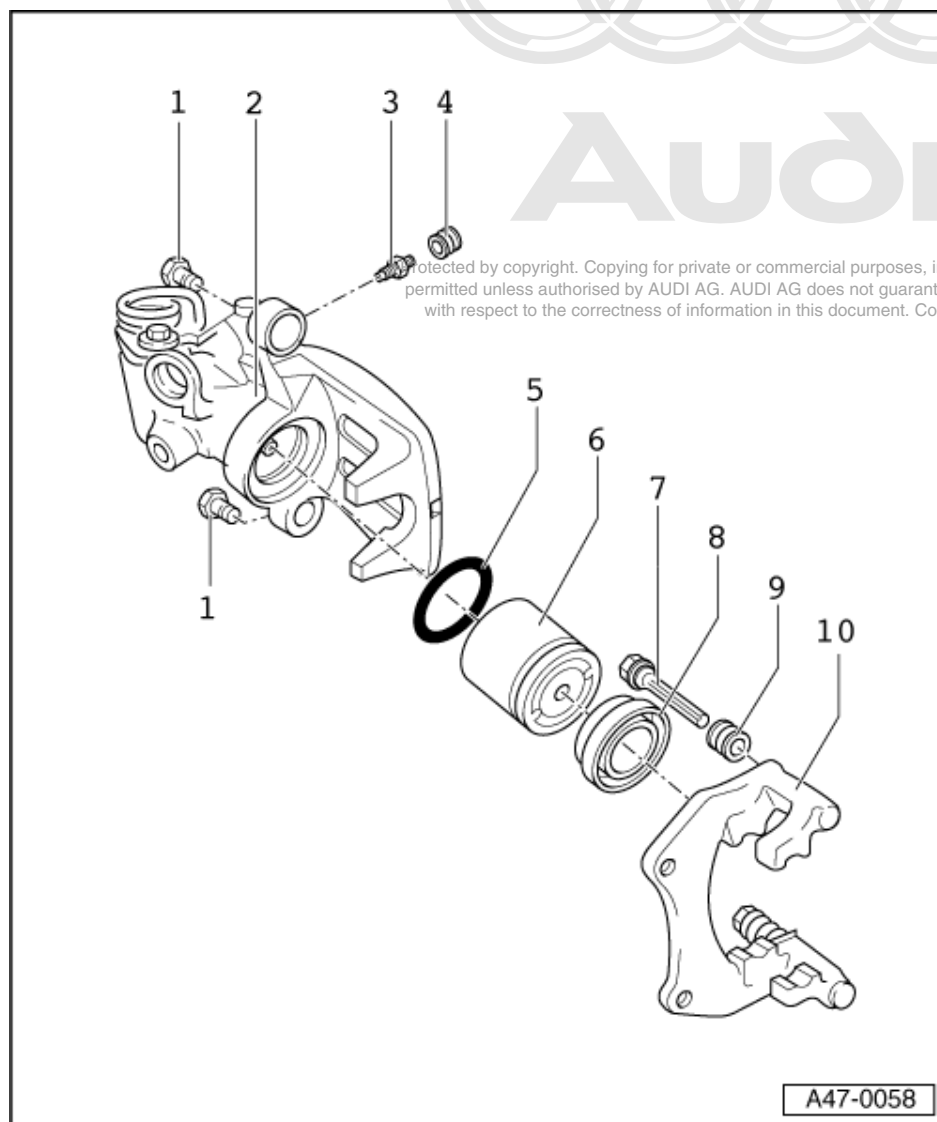
- Press piston back into brake caliper.

Note:

The protective seal outer sealing lip will then locate in the piston groove.

4 - Servicing rear brake caliper

4.1 - Servicing rear brake caliper

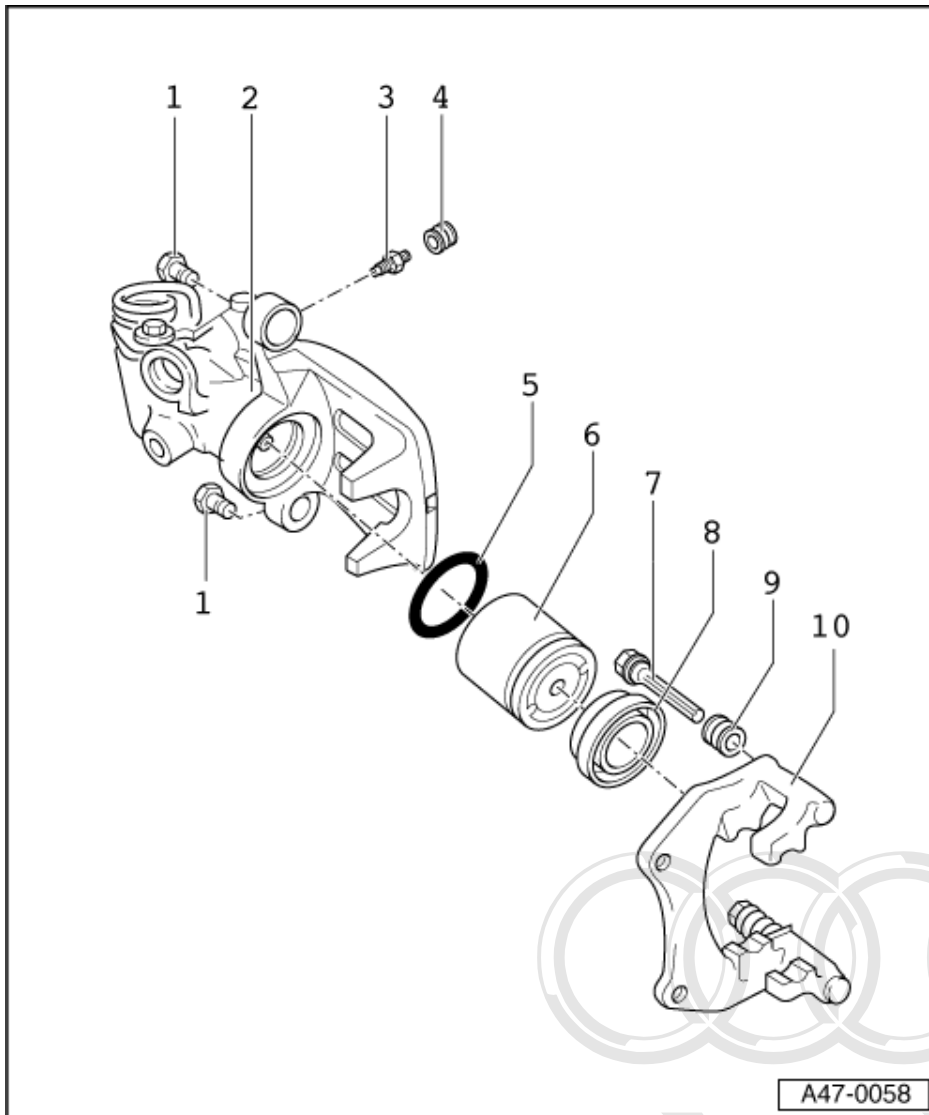


Note:

- ♦ When carrying out repairs install all parts supplied in repair kit.
- ♦ Apply thin coat of fitting paste G 052 150 A2 to brake cylinders, pistons and seals.

- 1 Self-locking bolt,
35 Nm**
- ♦ Always replace

- ♦ When loosening and tightening counter hold on guide pin



2 Brake caliper housing with handbrake cable lever

- ♦ Renew the brake caliper housing if there is a leak at the lever for the handbrake cable
- ♦ After servicing, pre-bleed brake caliper housing => Fig. 6

3 Vent valve

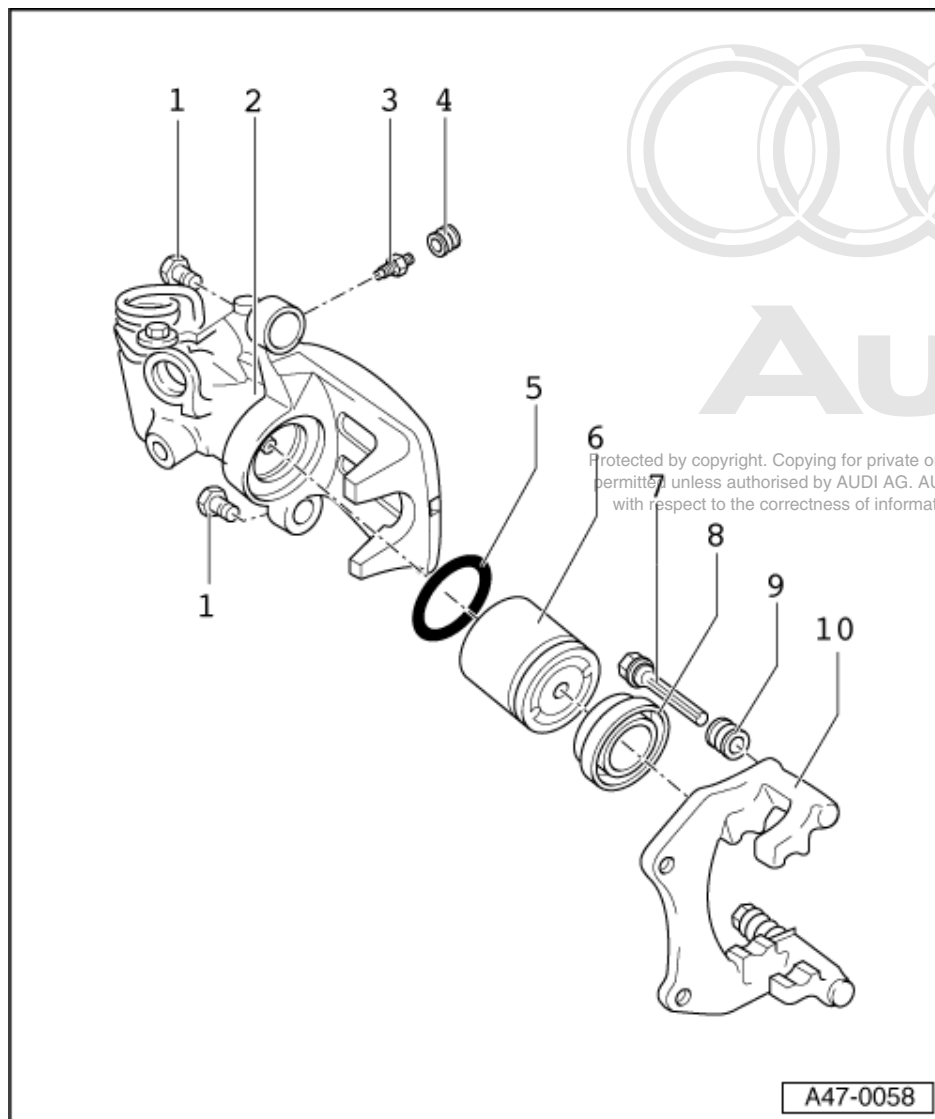
4 Dust cap

- ♦ Fit onto bleeder valve

5 Oil seal

- ♦ Use assembly wedge 3409 to remove => Fig. 3

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6 Piston with automatic adjustment

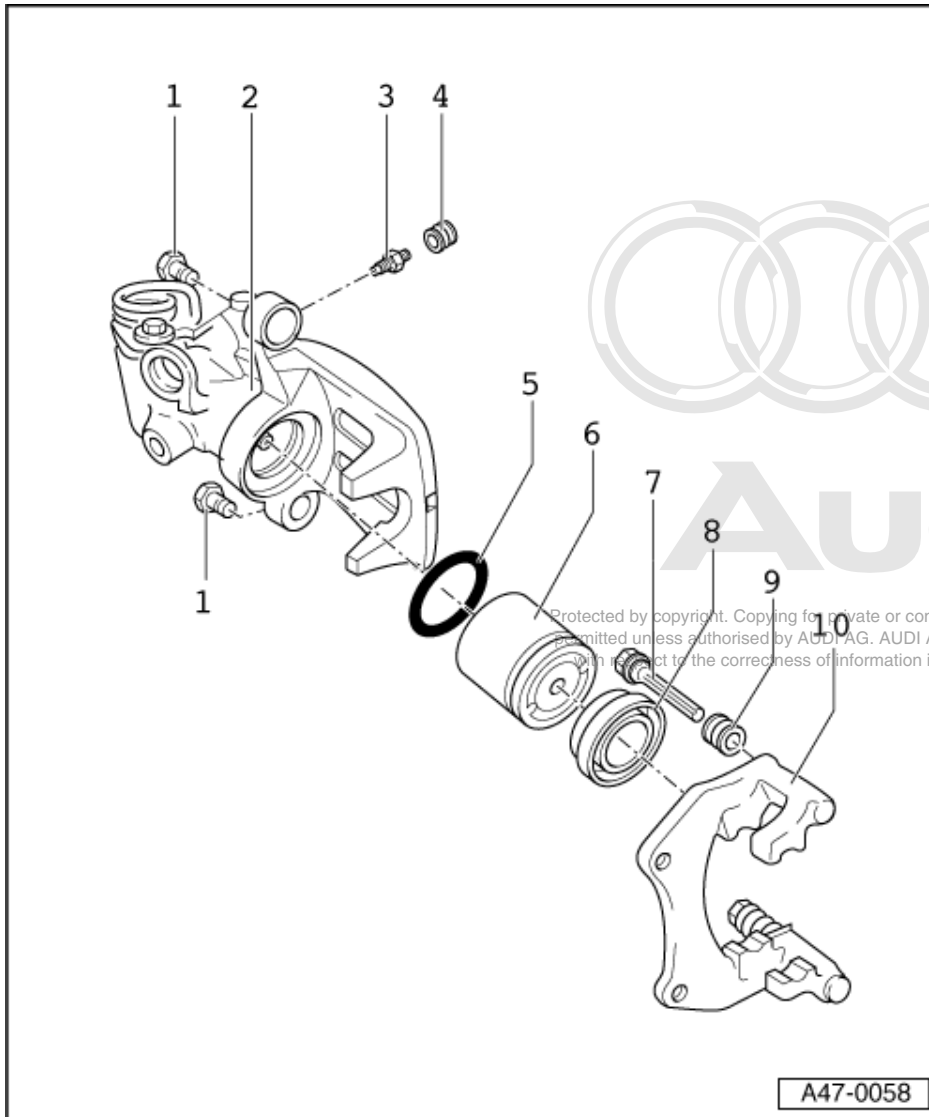
- ◆ Unscrewing from brake caliper housing =>Fig. 1
- ◆ Screwing into brake caliper housing =>Fig. 5

7 Guide pin

- ◆ Grease before fitting protective cap

8 End cap

- ◆ Fit onto piston with outer sealing lip => Fig. 2
- ◆ Insert with inner sealing lip in groove in brake caliper housing => Fig. 4



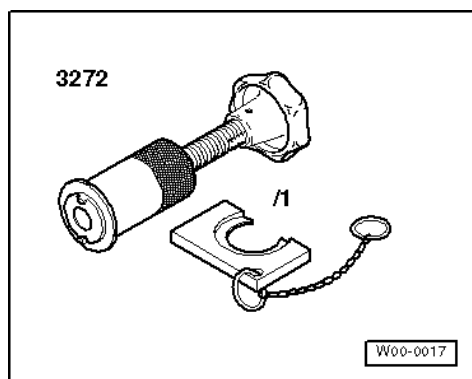
9 End cap

- ♦ Pull onto brake carrier and guide pin

10 Brake carrier with guide pin and protective cap

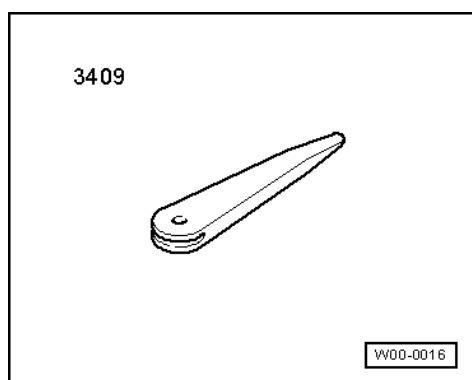
- ♦ Supplied as replacement part assembled with sufficient quantities of grease on guide pins
- ♦ If protective caps or guide pins are damaged, install repair kit. Use grease sachet supplied to lubricate the guide pins.

4.2 - Removing and installing rear brake caliper piston

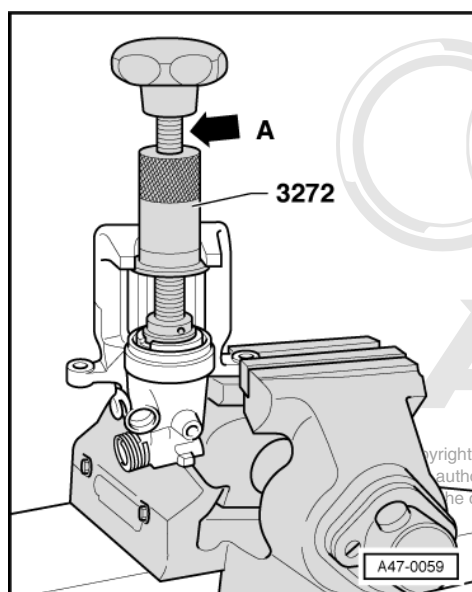


Special tools and workshop equipment required

- ♦ 3272 Resetting and removing tool

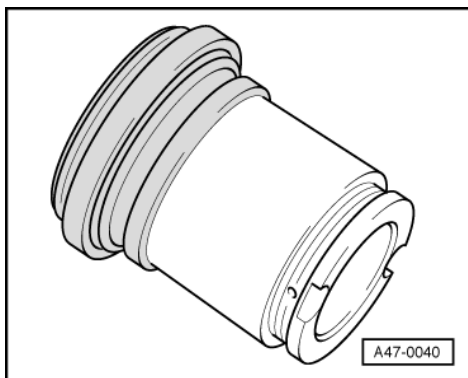


- ♦ 3409 Assembly wedge
- ♦ Bleeder bottle



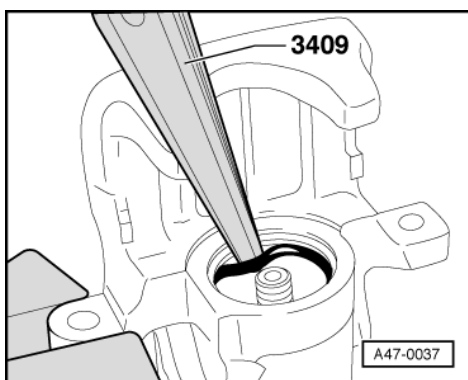
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-> Fig.1 Unscrewing piston from brake caliper housing

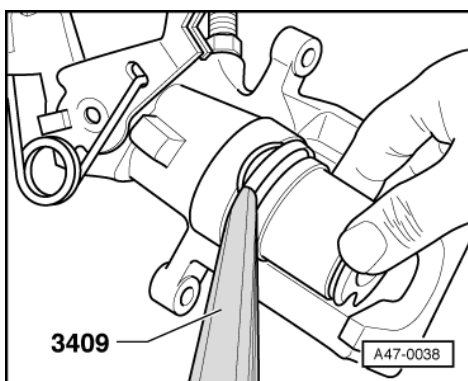


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-> Fig.2 Pulling on protective cap with outer sealing lip over piston



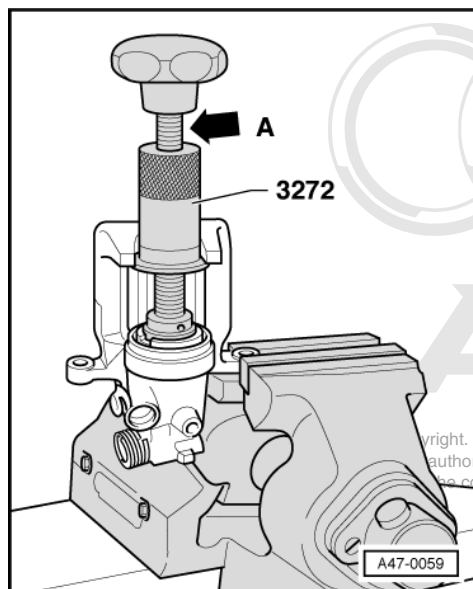
-> Fig.3 Remove seals using assembly wedge 3409



-> Fig.4 Inserting inner sealing lip of protective cap with wedge 3409

Note:

Hold piston in front of brake caliper housing.

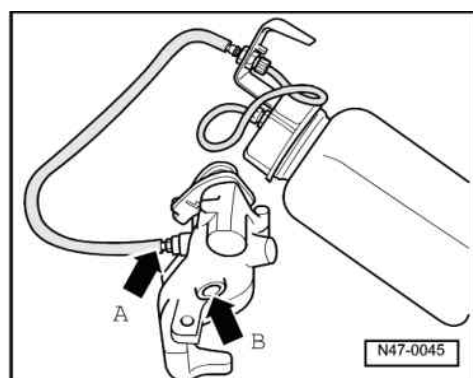


-> Fig. 5 **Screwing piston as far as its stop into brake caliper housing**

- Press firmly onto piston while screwing it in.

Note:

The protective seal outer sealing lip will then locate in the piston groove.



-> Fig.6 **pre-bleeding brake caliper**

- Open bleed valve -arrow A- and using a standard bleeder bottle, fill with brake fluid until bubble free brake fluid flows from the threaded hole (brake hose connection) -arrow B-. Close bleed screw.

Note:

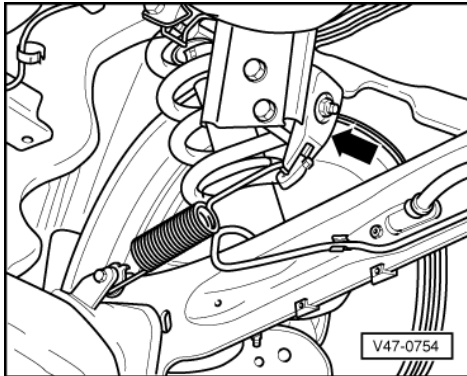
Position brake caliper as illustrated for pre-bleeding.

5 - Checking and adjusting brake pressure regulator

5.1 - Checking and adjusting brake pressure regulator

The brake pressure regulator was discontinued on introduction of the Bosch ABS system (as of MY '95).

5.2 - Vehicles with front-wheel drive



-> The brake pressure regulator is attached to the bodywork and controlled by way of a spring from the rear axle.

Note:

On vehicles with self-levelling suspension, the brake pressure regulator is hydraulically controlled and cannot be adjusted.

check function

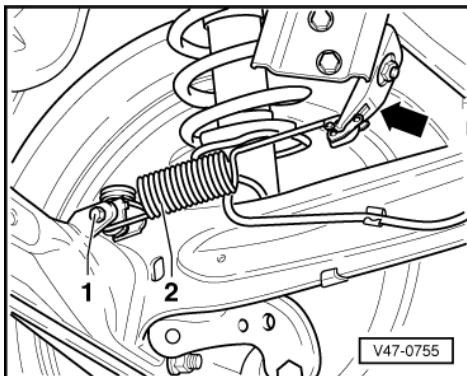
Depress brake pedal firmly and release it abruptly (vehicle standing on ground). Lever of brake pressure regulator must move.

Adjusting regulator

Note:

Braking system must have been fitted and bled in the prescribed manner.

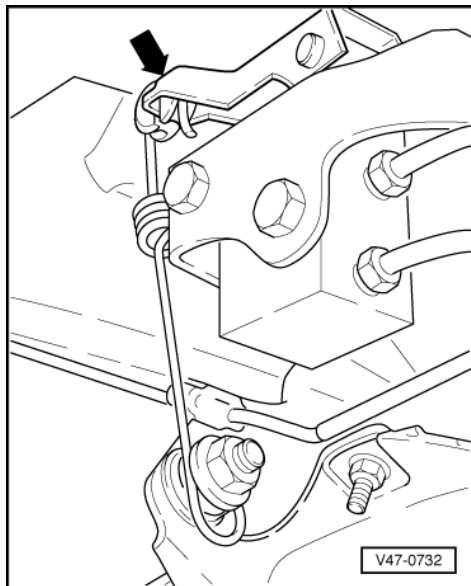
- Jack up vehicle.
- Rear axle allowed to fully rebound.



- -> Press lever of brake pressure regulator as far as it will go in direction of arrow.
- Loosen nut-1-.
- Engage tension spring -2- between brake pressure regulator and mount such that there is no play.

- Tighten nuts -1- to 20 Nm.

5.3 - Vehicles with four-wheel drive



-> The brake pressure regulator is attached to the bodywork and controlled by way of a spring from the trapezium link.

Note:

On vehicles with self-levelling suspension, the brake pressure regulator is hydraulically controlled and cannot be adjusted.

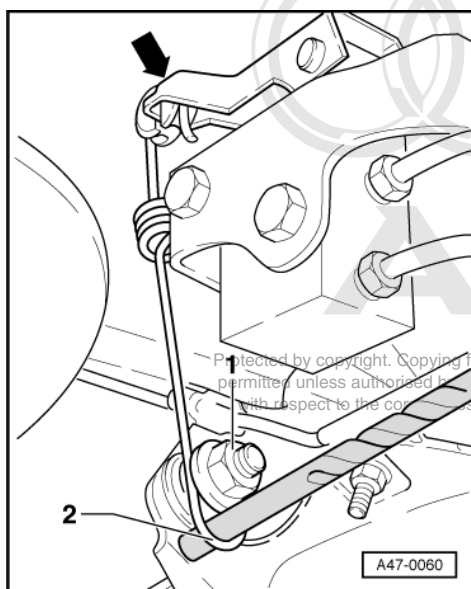
check function

Depress brake pedal firmly and release it abruptly (vehicle standing on ground). Lever of brake pressure regulator must move.

Adjusting regulator

Note:

Braking system must have been fitted and bled in the prescribed manner.



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- Jack up vehicle.
- Rear axle allowed to fully rebound.
- -> Press lever of brake pressure regulator as far as it will go in direction of arrow.
- Position drill bit -2- between tension spring and mount.

Settings

Model	Drill bit ø in mm
Audi S4 Audi 100 Avant for Norway with ventilated rear brake	8
Audi S4 4.2	12
All other Audi 100 models	4

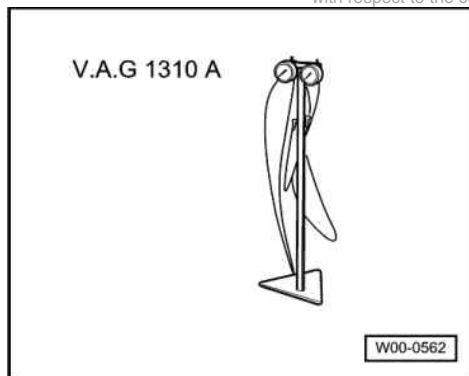
- Tighten nuts -1- to 20 Nm.
- Take out drill bit.
- Engage tension spring in mount.

6 - Checking brake pressure reducer

6.1 - Checking brake pressure reducer

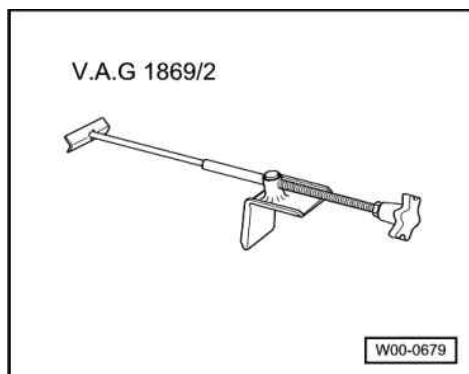
4WD vehicles up to chassis no. PN 027 039 only

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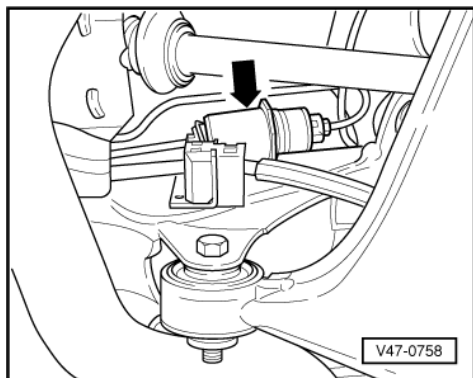


Special tools and workshop equipment required

- ♦ V.A.G 1310 A Braking-system tester

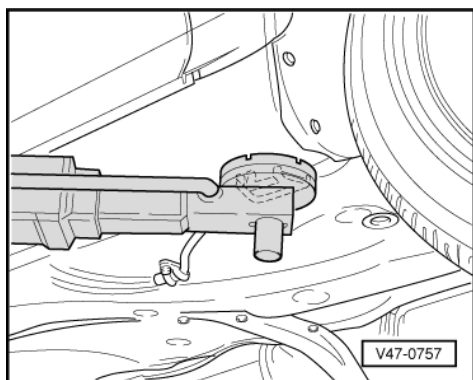


- ♦ V.A.G 1869/2 Brake pedal depressor

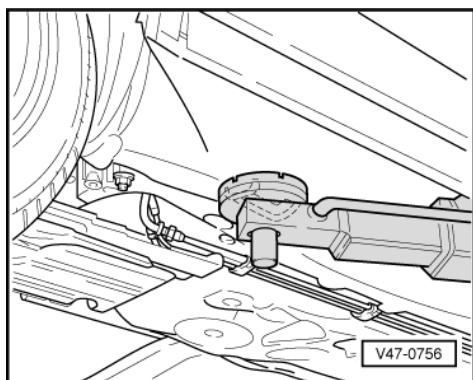


-> Brake pressure reducer is installed between right and left rear brake.

- Insert brake pedal depressor V.A.G 1869/2.
- Screw out bleed screw at rear brake calipers. Connect pressure gauge of V.A.G 1310 A and bleed system.
- Apply handbrake.
- Jack up right side of vehicle 350 - 450 mm at both jacking points for lifting platform (measured at wheel arch).



- -> Front jacking point.



- -> Rear jacking point.
- Remove brake pedal depressor V.A.G 1869/2.
- Press brake pedal until pressure gauge reading for rear left brake caliper is approx. 40 bar.
- Read off pressure gauge for rear right brake caliper.



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Specified value at pressure gauge for rear right brake caliper. 20 + 5 bar.

Note:

Brake pressure reducer is to be replaced in the event of deviation in pressure at pressure gauge for rear right brake caliper.

- Insert brake pedal depressor V.A.G 1869/2.
- Detach pressure gauge and screw in bleed screws.
- Bleed brake system => Page 121
- Remove brake pedal depressor V.A.G 1869/2.

7 - Bleeding braking system, vehicles with and without ABS

7.1 - Bleeding braking system, vehicles with and without ABS

Only use new genuine VW/Audi brake fluid according to US standard FMVSS 116 DOT 4.

Warning!

- ◆ Do not under any circumstances allow brake fluid to come into contact with liquids which contain mineral oils (e.g. oil, petrol, cleaning agents). Mineral oils damage the plugs and seals in the brake system.
- ◆ Brake fluid is poisonous and must on no account be siphoned orally through a hose. Because of its caustic properties it must also not come into contact with paintwork.
- ◆ Brake fluid is hygroscopic, i.e. it absorbs moisture from the surrounding air, and should therefore always be stored in airtight containers.
- ◆ Always observe the relevant environmental regulations for disposal.
- ◆ Use plenty of water to flush away any brake fluid spillage.
- ◆ When the system is open do not work with compressed air and do not move the vehicle.

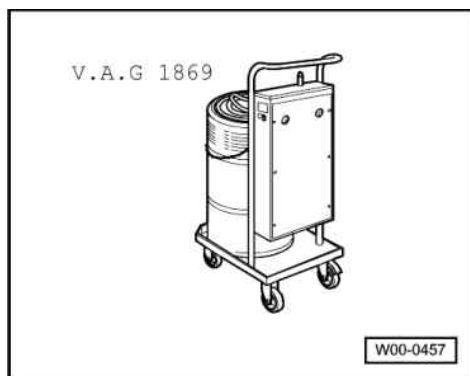
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7.2 - Bleeding brake system with brake filling and bleeding appliance V.A.G 1869

For information on handling brake fluid, brake components and brake tools, refer to:

=> Special Information Binder; Running Gear No 21

Special tools and workshop equipment required



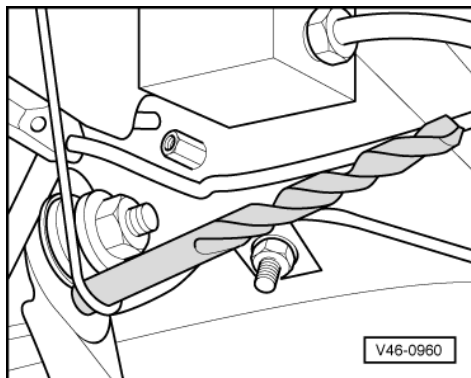
- ◆ V.A.G 1869 Brake filling and bleeding appliance

Note:

Bleeding of the brake system on vehicles with ABS is performed in the same manner as for vehicles with a conventional braking system

Bleeding procedure for vehicles with four-wheel drive:

- Connect V.A.G 1869.



- -> Whilst bleeding rear brake, jam drill bit of at least $\varnothing 6$ mm between bottom end of spring and mount of spring for brake pressure regulator.

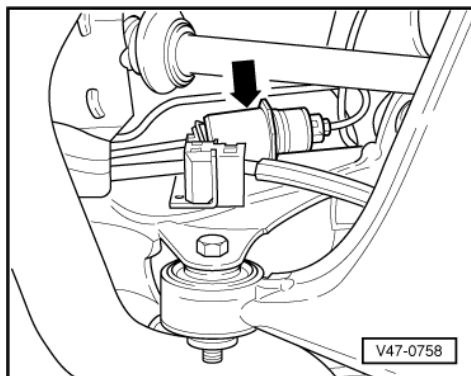
This specification does not apply to vehicles with Bosch 5.0 ABS system (as of MY '95) and/or self-levelling suspension.

- Open bleeder screws in prescribed sequence and bleed brake calipers and wheel brake cylinders.

Bleeding sequence

- 1 - Rear right brake caliper or wheel brake cylinder
- 2 - Rear left brake caliper or wheel brake cylinder
- 3 - Front right brake caliper
- 4 - Front left brake caliper

4WD vehicles up to chassis no. PN 027 039 only



- -> Re-bleeding of the rear right wheel brake cylinder/brake caliper has to be performed on vehicles with brake pressure reducer.
- Start engine.
- Press brake pedal several times to allow residual air to escape from brake pressure reducer.

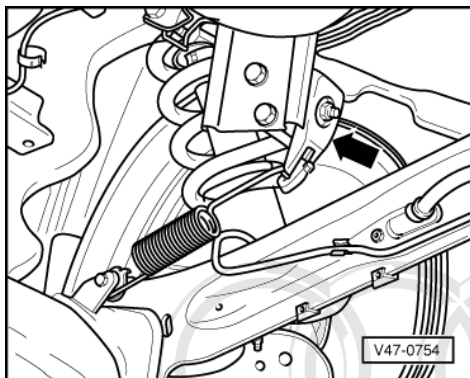
As of chassis no. PN 027 040, 4WD vehicles no longer feature a brake pressure reducer.

Bleeding procedure for vehicles with front-wheel drive:

- Connect V.A.G 1869.



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- -> Whilst bleeding rear brake, press lever of brake pressure regulator firmly towards rear axle.

This specification does not apply to vehicles with Bosch 5.0 ABS system (as of MY '95) and/or self-levelling suspension.

- Open bleeder screws in prescribed sequence and bleed brake calipers and wheel brake cylinders.

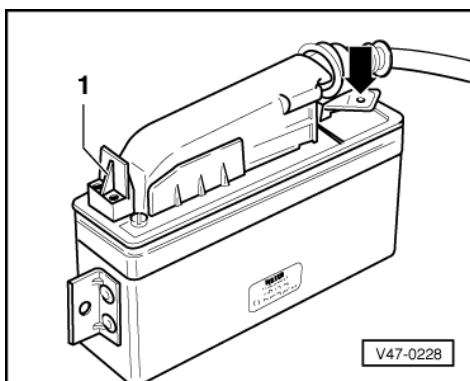
Bleeding sequence (with the exception of vehicles from model years 1992 to 1994 with ABS and EDL)

- 1 - Rear right brake caliper or wheel brake cylinder
- 2 - Rear left brake caliper or wheel brake cylinder
- 3 - Front right brake caliper
- 4 - Front left brake caliper

- Close bleed screw.
- During the final test drive, ensure that an ABS-controlled brake application is carried out at least once (with noticeable pulsing of brake pedal).

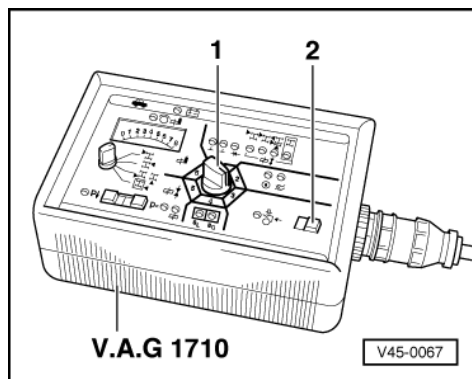
Bleeding sequence with vehicles from model years 1992 to 1994 with ABS and EDL

- 1 - Suction pipe for EDL, bleed screw at hydraulic unit
- 2 - Rear right brake caliper
- 3 - Rear left brake caliper
- 4 - Front right brake caliper, however additionally connect ABS-tester V.A.G 1710 => Page 123 and allow return pump to run.
- 5 - Front left brake caliper



Connecting ABS tester

- Switch off ignition.
- Remove rear bench seat.
- -> Pull plug off ABS control unit -J104; to do so, press spring -arrow-.
- Connect plug of lead of ABS testers V.A.G 1710 to plug of ABS control unit -J104.



- -> Set program switch -1- on ABS tester V.A.G 1710 to position -3-.
- Switch ignition on.
- Press button -2-.
- Open bleed screw at brake caliper until there are no bubbles in brake fluid as it emerges; ABS return flow pump - V39 must be heard to run.
- Close bleed screw.

This procedure should not last more than 60 seconds.

After 60 seconds, a cooling interval of at least 5 minutes is to be allowed. The procedure is to be repeated.

- Switch off ignition.
- Remove ABS-tester V.A.G 1710 and attach to plug to ABS-control unit -J104 .
- Fit rear seat bench.
- During the final test drive, ensure that an ABS-controlled brake application is carried out at least once (with noticeable pulsing of brake pedal).

7.3 - Brake fluid: changing (every 24 months)

Only use new genuine VW/Audi brake fluid according to US standard FMVSS 116 DOT 4.

Warning!

- ♦ Do not under any circumstances allow brake fluid to come into contact with liquids which contain mineral oils (e.g. oil, petrol, cleaning agents). Mineral oils damage the plugs and seals in the brake system.
- ♦ Brake fluid is poisonous and must on no account be siphoned orally through a hose. Because of its caustic properties it must also not come into contact with paintwork.
- ♦ Brake fluid is hygroscopic, i.e. it absorbs moisture from the surrounding air, and should therefore always be stored in airtight containers.
- ♦ Always observe the relevant environmental regulations for disposal.
- ♦ Use plenty of water to flush away any brake fluid spillage.
- ♦ When the system is open do not work with compressed air and do not move the vehicle.

For information on handling brake fluid, brake components and brake tools, refer to:

=> Special Information Binder; Running Gear No 21

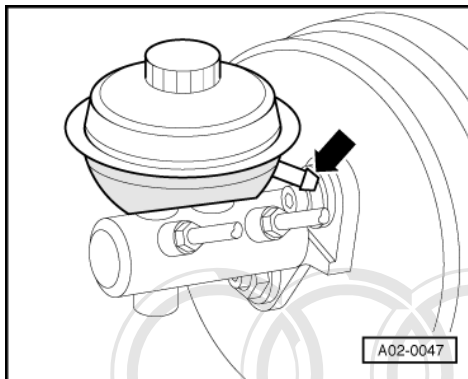


Special tools and workshop equipment required

- ♦ V.A.G 1869 Brake filling and bleeding appliance
- Open brake fluid reservoir.

Note:

The brake fluid reservoir must be kept adequately filled to ensure that no air can enter the brake system from the reservoir.



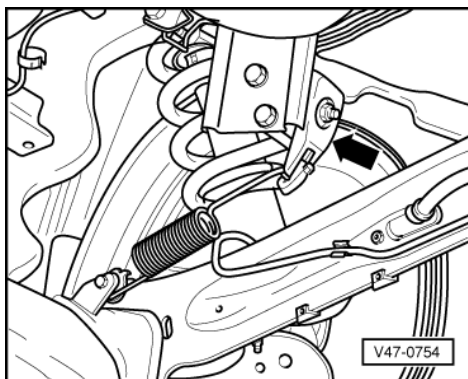
- Open the bleed screw on rear right brake caliper or wheel brake cylinder.
- Place a suitable container under the bleed screw to catch the used brake fluid.
- -> With the engine running, use the brake pedal to pump out brake fluid until the fluid level reaches the connection -arrow- on the reservoir.
- Close bleed screw.

On vehicles with manual gearbox the clutch slave cylinder should also be "flushed" with new brake fluid. When doing so, note the following:

- Connect V.A.G 1869 but do not switch on yet.
- **Open bleed screw on clutch slave cylinder.**
- **Connect breather hose of brake fluid collector to bleed screw on clutch slave cylinder.**
- Switch on the bleeder appliance and allow about 100 cm³ of brake fluid to drain out.
- Close bleed screw.

Sequence for changing brake fluid in brake calipers or wheel brake cylinders:

- 1 - Rear right brake caliper or wheel brake cylinder
 - 2 - Rear left brake caliper or wheel brake cylinder
 - 3 - Front right brake caliper
 - 4 - Front left brake caliper
- Connect breather hose of brake fluid collector to bleed screw on relevant brake caliper or wheel brake cylinder.

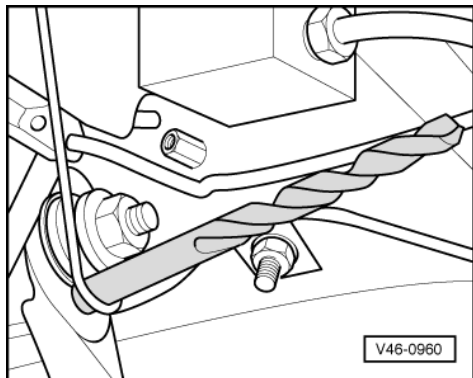


Vehicles with front wheel drive:

- -> Whilst bleeding rear brake, press lever of brake pressure regulator firmly towards rear axle -arrow-.

This specification does not apply to vehicles with Bosch 5.0 ABS system (as of MY '95) and/or self-levelling suspension.

Vehicles with four-wheel drive:



- -> Whilst bleeding rear brakes, jam drill bit of $\varnothing$ at least 6 mm between bottom end of spring and mount of brake pressure regulator.

This specification does not apply to vehicles with Bosch 5.0 ABS system (as of MY '95) and/or self-levelling suspension.

All vehicles:

Note:

Note the different quantities involved:

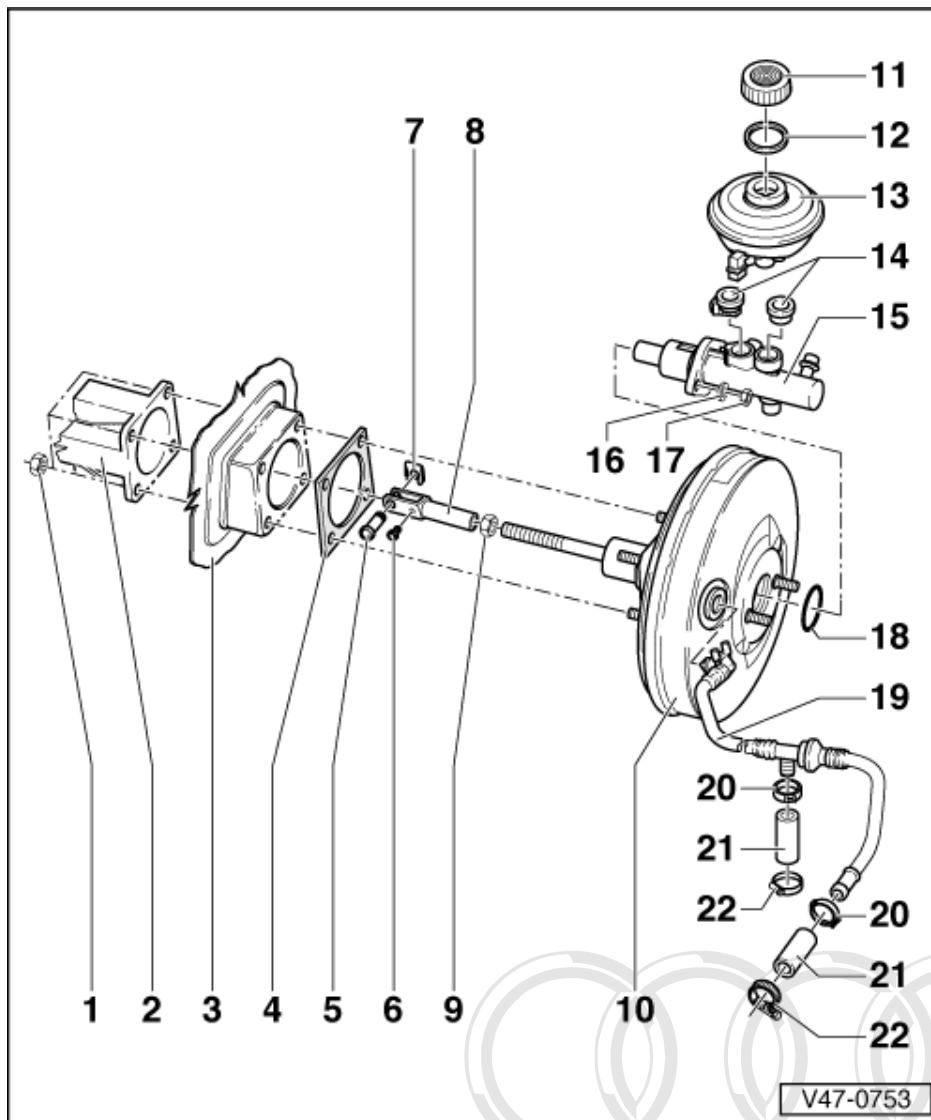
- ♦ Vehicles ▶ 1994: approx. 500 cm³ per brake caliper or wheel brake cylinder.
- ♦ Vehicles 1995 ▶: approx. 250 cm³ per brake caliper.
- Open bleed screw and allow approx. 250 cm³ or approx. 500 cm³ of brake fluid to drain out.

Pumping in new brake fluid flushes the used brake fluid out of the system.

- Close bleed screw.
- Disconnect hose from brake fluid reservoir.
- Check pedal pressure and brake pedal free play.
 - Free play: max. 1/3 of pedal travel
- During the final test drive, ensure that an ABS-controlled brake application is carried out at least once (with noticeable pulsing of brake pedal).

8 - Assembly overview: Vacuum-type brake servo/brake master cylinder

8.1 - Assembly overview: Vacuum-type brake servo/brake master cylinder



Note:

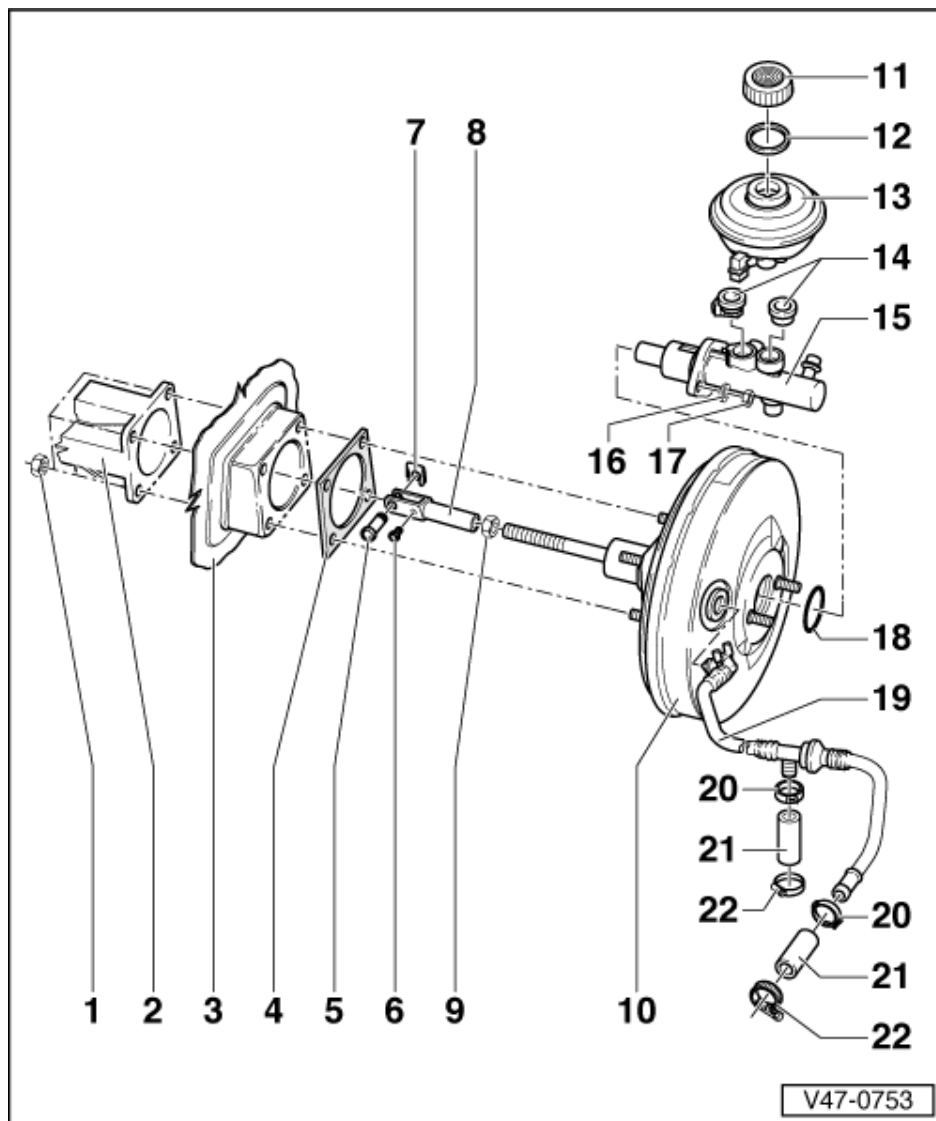
- ♦ The complete brake master cylinder and brake servo can be replaced separately from each other.
- ♦ Brake master cylinders cannot be dismantled any further, i.e. no provision is made for servicing.
- ♦ Use only fresh brake fluid. Refer to information on brake fluid reservoir.
- ♦ Assignment of brake pipe connections => Repair Group 45.

1 Self-locking nut, 25 Nm

- ♦ Renew each time after removing

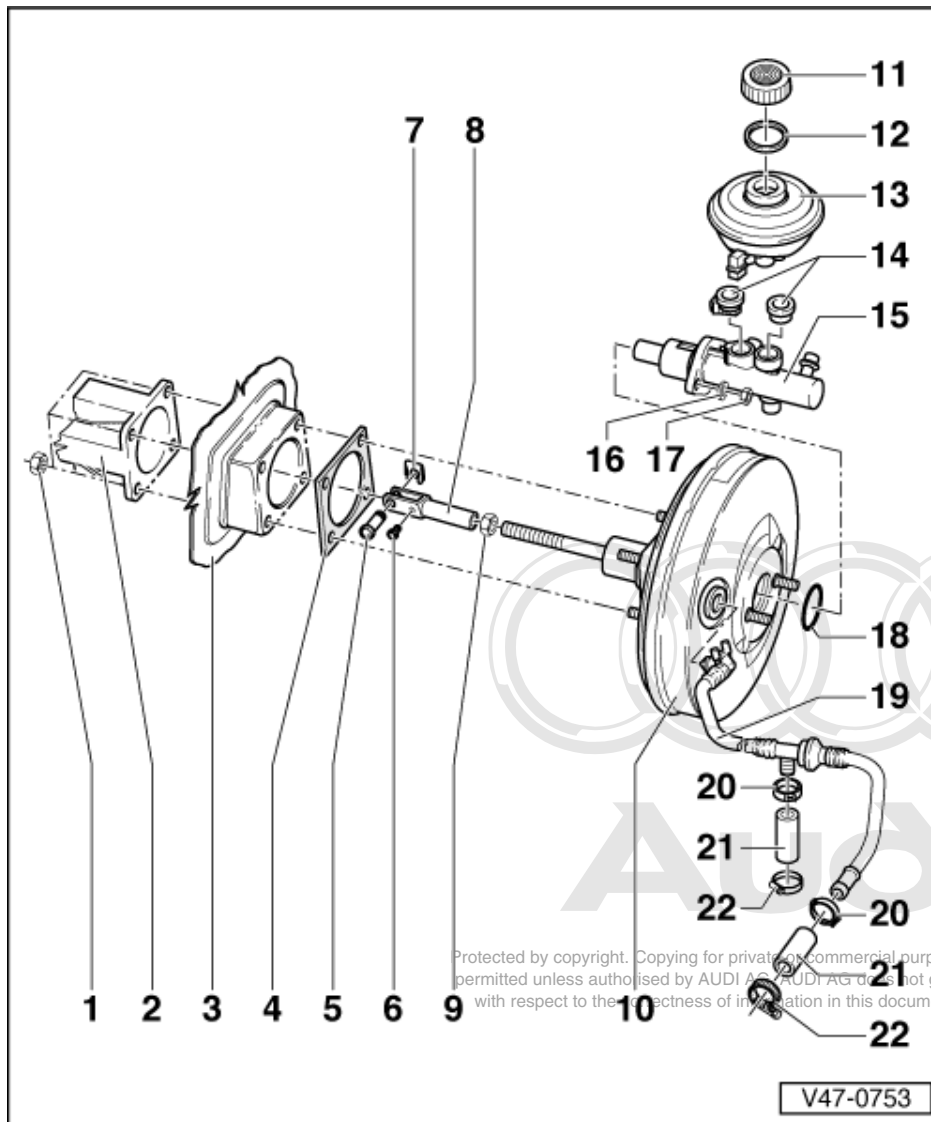
2 Mounting

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- 3 Bulkhead
- 4 Gasket
 - ◆ Replace after removing brake master cylinder
- 5 Pin
 - ◆ Insert in clevis
- 6 Grommet
 - ◆ Insert in clevis
 - ◆ Insert rear spring for brake pedal
- 7 Locking clip
 - ◆ Fit onto pin
- 8 Clevis
 - ◆ adjusting => Fig. 1
- 9 Nut

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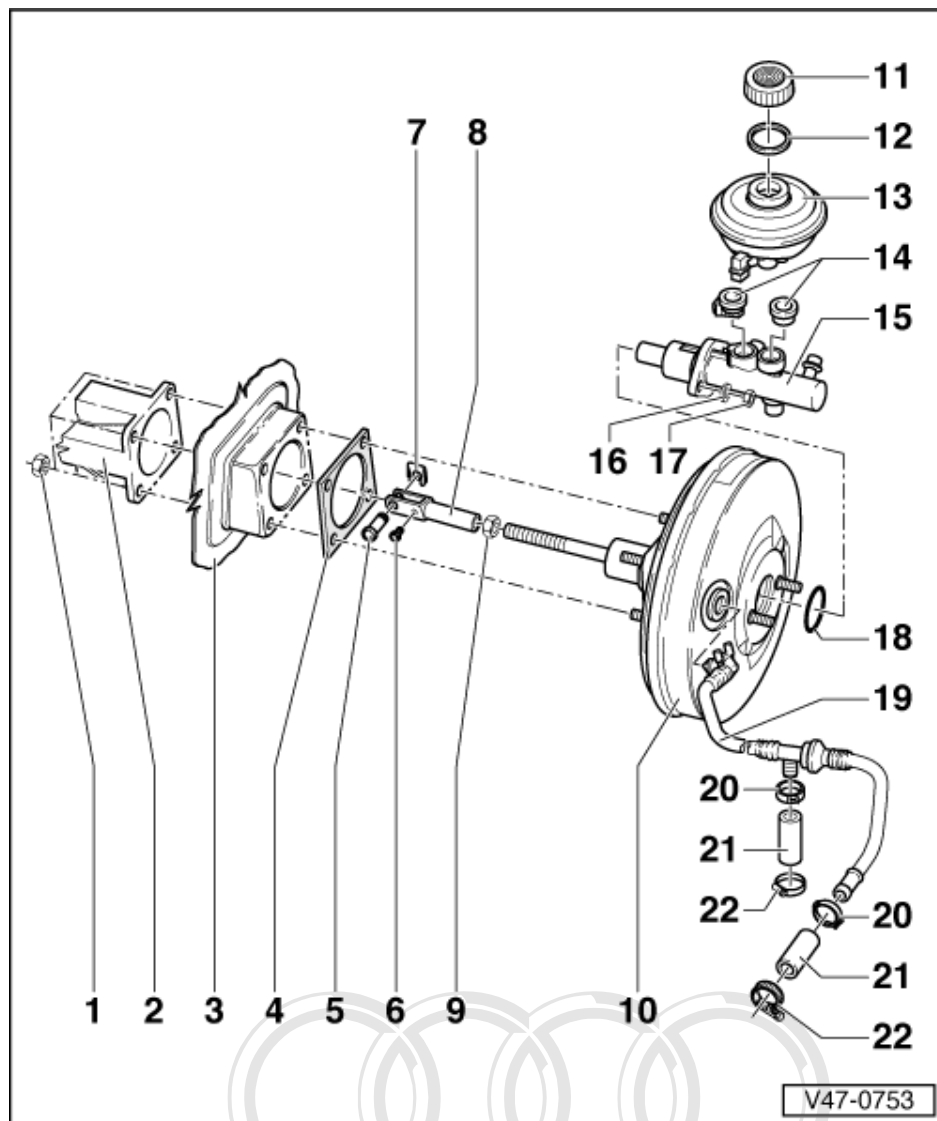


10 Brake servo

- ♦ Removing and installing =>Page 135
- ♦ On petrol engines the vacuum required is taken from the intake manifold.
- ♦ With diesel, 5- and 6-cylinder-engines, vacuum pump is fitted to generate vacuum.

Note:

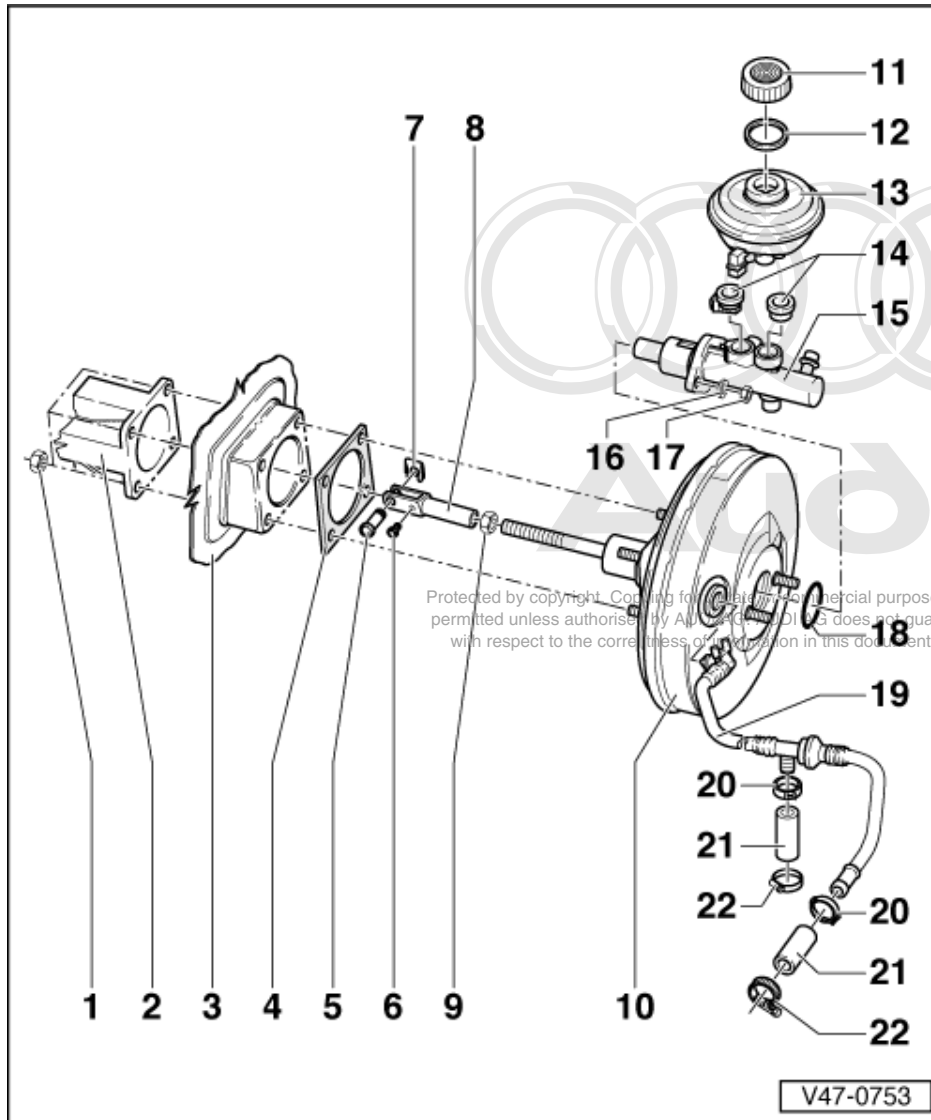
- ♦ As of 05/91, vacuum pump was discontinued on vehicles with 6-cylinder engine and manual gearbox. The vacuum pump required is tapped from the intake manifold.
- ♦ As of 03/92, vacuum pump was discontinued on vehicles with 6-cylinder engine and automatic gearbox. The vacuum pump required is generated by a suction jet pump.



- ◆ Functional check
 - With engine switched off, depress brake pedal firmly several times (to exhaust the vacuum in the unit).
 - Now depress brake pedal with moderate force, hold and start engine. If the servo unit is working properly, the pedal will be felt to give slightly under foot (servo assistance becomes effective).
- ◆ If faulty renew complete.

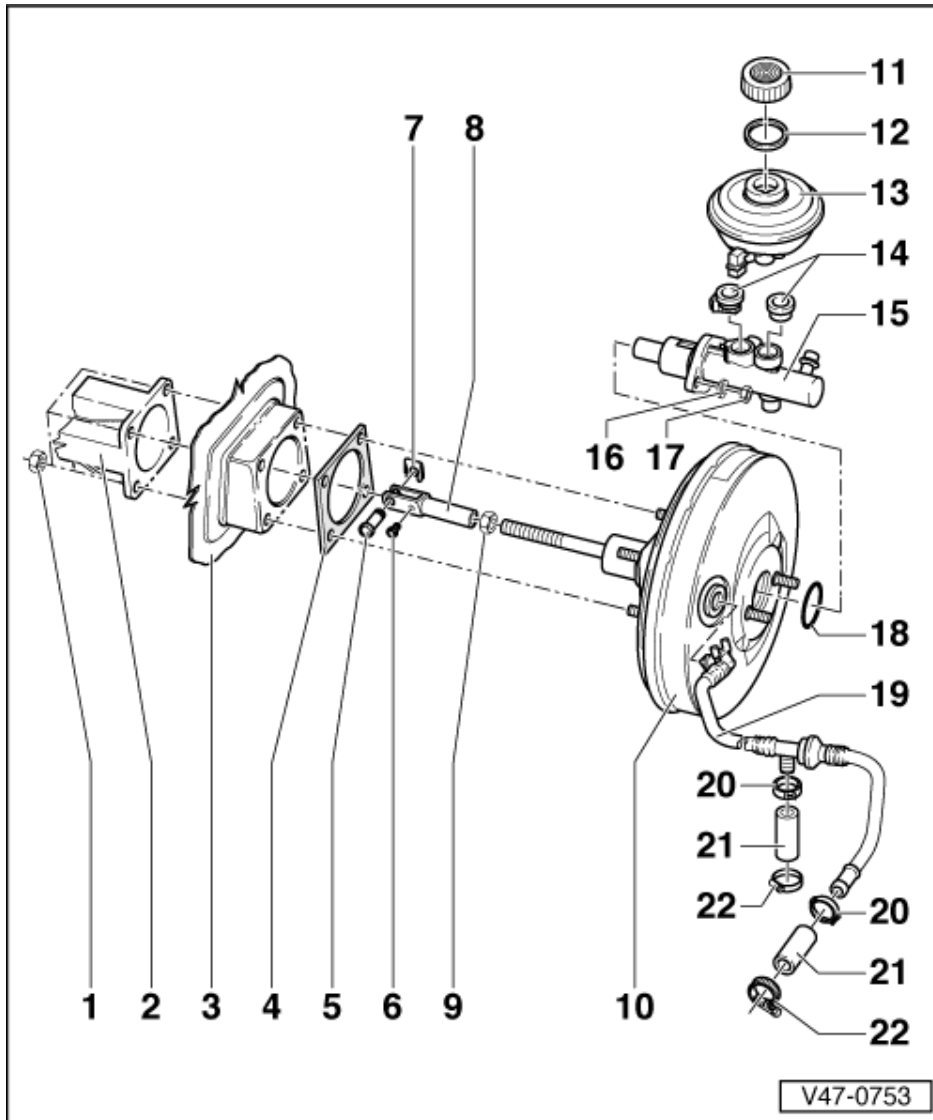
11 Cap
12 Gasket

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13 Brake fluid reservoir with float warning indicator

- ◆ Functional test up to 07/92
- With ignition switched on, press firmly by hand on centre of cap (diaphragm). Warning lamp in instrument cluster lights and acoustic alarm sounds.
- ◆ Functional test as of 07/92
- With the ignition switched on, remove the cap and press with your hand on the strainer that is visible. Warning lamp in instrument cluster lights and acoustic alarm sounds.
- ◆ Connection for hydraulic coupling is located on side
- ◆ Refer to label on reservoir before topping up brake fluid



14 Sealing plug

- ◆ Moisten with brake fluid and insert into brake master cylinder
- ◆ Press brake fluid reservoir into sealing plugs
- ◆ Vehicles with steel-brake master cylinder (Girling) => Page 134

15 Brake master cylinder, $\varnothing 23.81$ mm

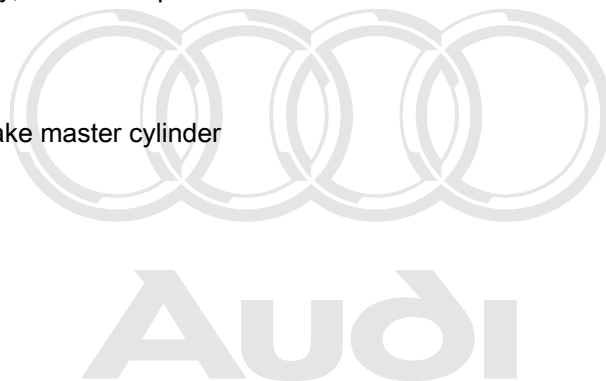
- ◆ Cannot be repaired. If faulty, renew complete.

16 Washer

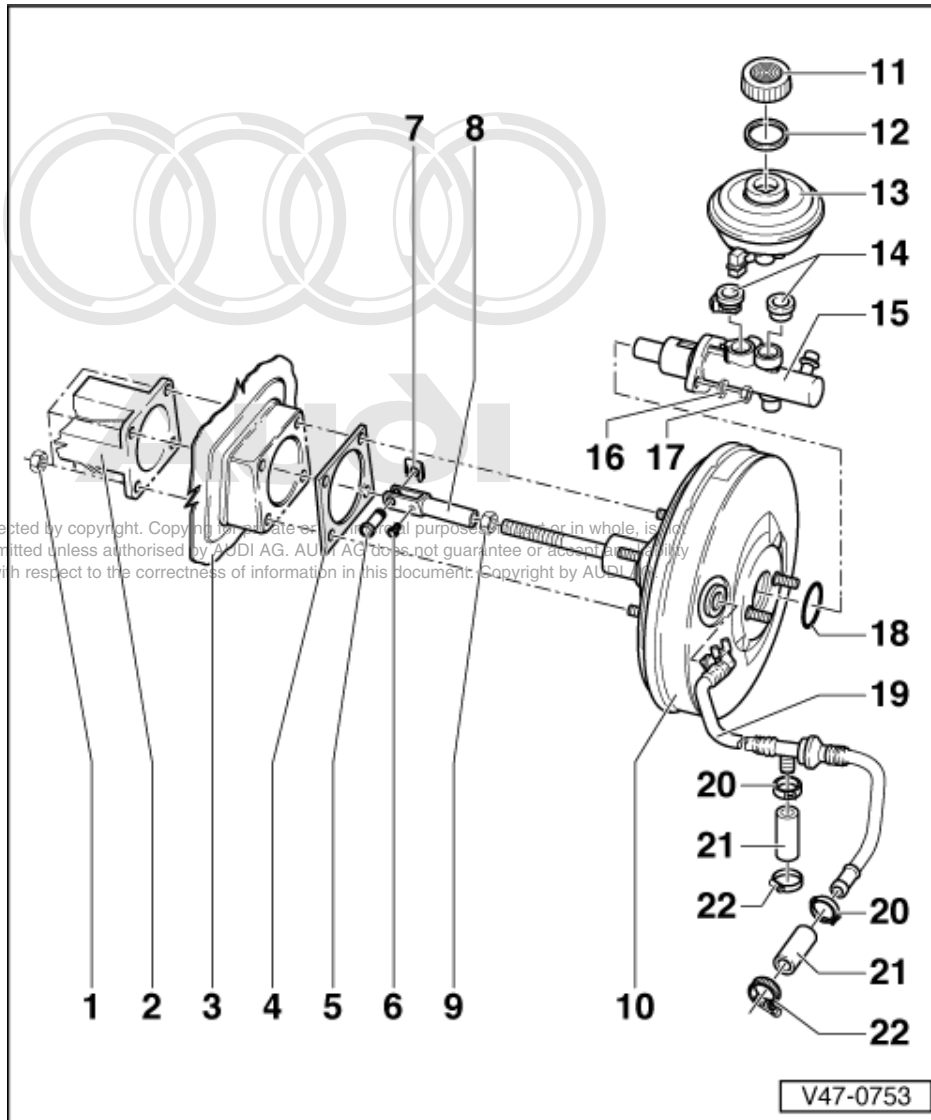
17 Hexagon nut 25 Nm

18 Oil seal

- ◆ Replace after removing brake master cylinder



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19 Vacuum hose with non-return valves

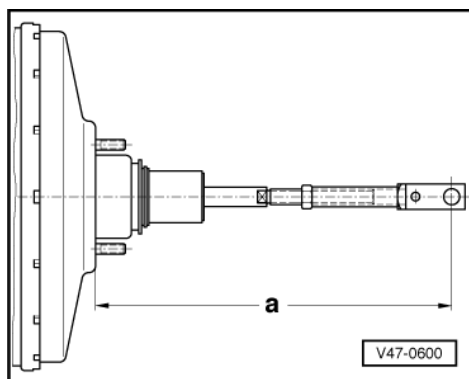
- Insert into brake servo unit

20 Hose clamp

21 Vacuum hose

- ♦ Attach to vacuum pump or intake manifold and secure with hose clamp

22 Hose clamp





-> Fig.1 Adjusting clevis

a = 230 mm $\pm$ 0.5 mm, LHD

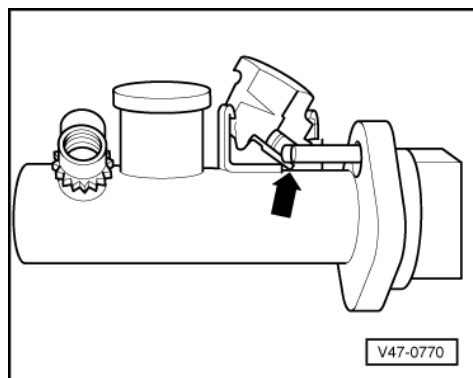
a = 233 mm $\pm$ 0.5 mm, RHD

Note:

- ♦ When measuring, the clevis should be aligned at right angles to the surface of the brake servo unit.
- ♦ Measure without gasket as far as centre of hole in clevis.

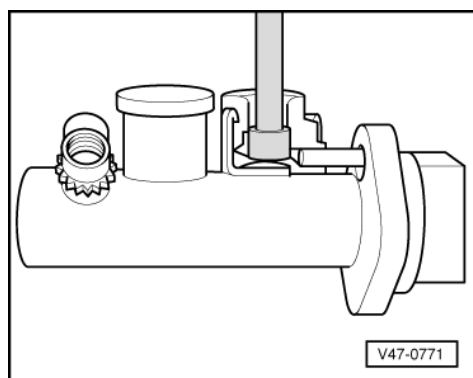
Replacing plug (primary piston circuit)

Note:



For ease of illustration, the brake master cylinder is partly cut away.

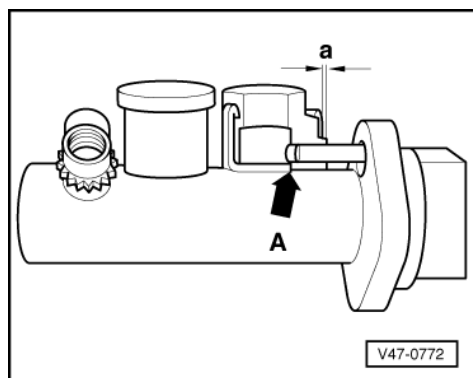
- Moisten inside of plug only with brake fluid.
- Insert plug.
- -> Make sure that guide of plug is slipped over tube of primary piston circuits -arrow-.



- -> Press guide of plug onto tube.

Note:

Never use a sharp object when doing so!



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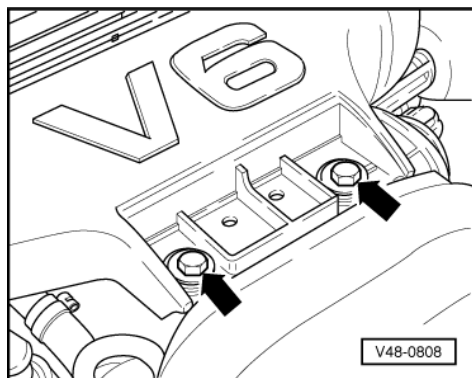
- -> Guide of plug must protrude approx. 1 mm (dimension -a-) out of housing.
- Compliance with dimension -a- guarantees that shoulder -A- is engaged behind housing panel.

8.2 - Removing and installing brake servo with brake master cylinder

Removing

Note:

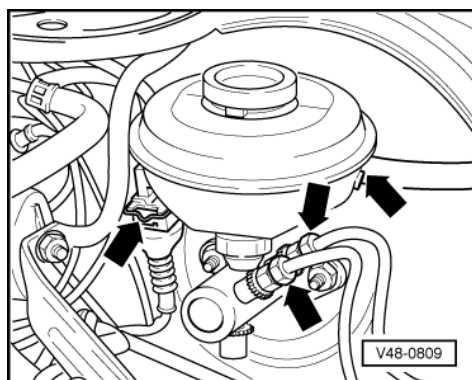
Removal and installation are described for a vehicle with 6-cylinder engine, air conditioner and ABS.



- Prise cover off intake silencer.
- -> Unscrew hexagon nuts -arrow-.
- Unscrew crankcase breather hoses at valve covers and pull off.
- Press intake silencer to rear and lift upwards at the same time.
- Pull vacuum hose off intake silencer and take out intake silencer.

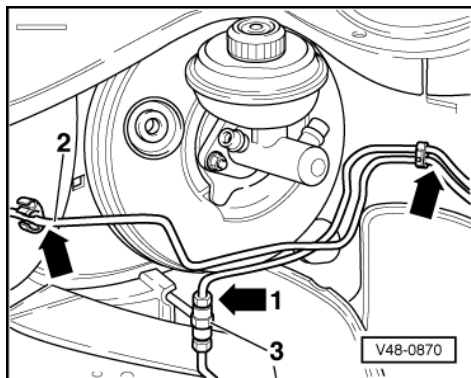
Note:

After removing brake pipes, seal all holes with plugs from repair set, part no. 1H0 698 311 A

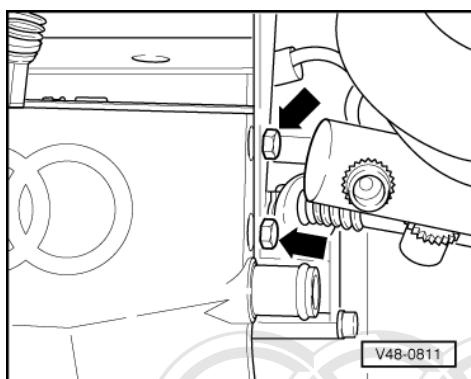


- Draw off as much brake fluid as possible from the brake fluid reservoir, with a suction bottle.
- -> Pull off supply hose for clutch master cylinder -arrow- right-.
- Pull out vacuum pipe of brake servo.
- Unscrew brake pipes at brake master cylinder -arrow- centre-.
- Pull off plug for brake fluid indicator -arrow left-.

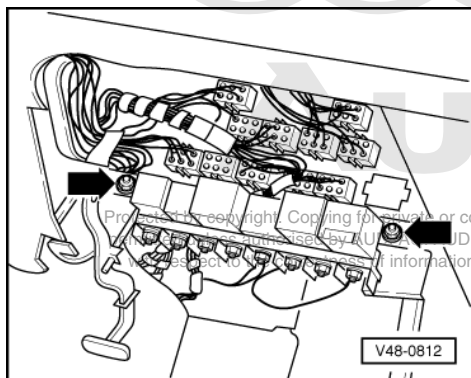
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- -> Remove brake pipe -arrow 1- between hydraulic unit and adapter -3-.
- Unclip brake pipe -2- from holders at wheel housing and bulkhead -arrow-.
- Carefully press brake pipe in direction of travel until it does not impede removal of brake servo.



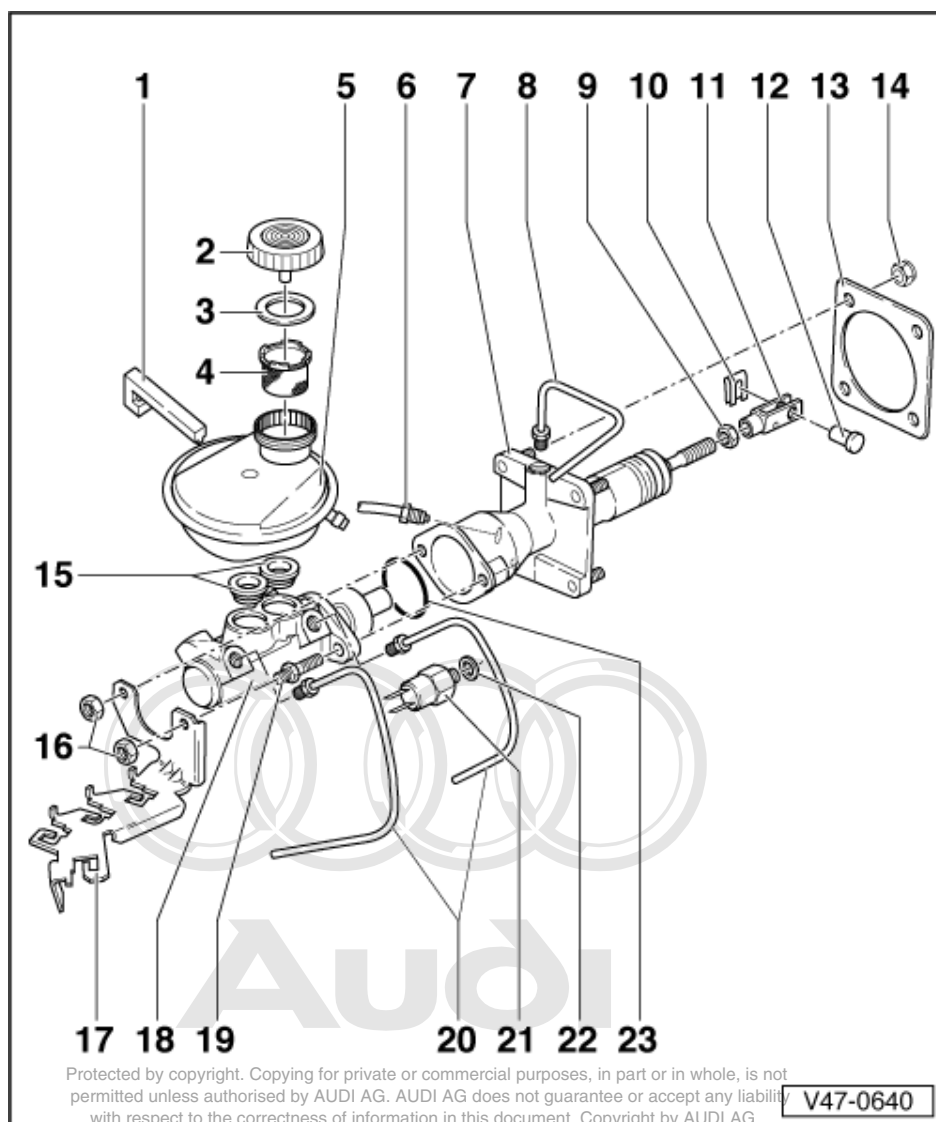
- -> Unscrew holder for vacuum unit from left valve cover and lay aside.
- Remove bottom left shelf.
- Take out air vent in footwell on left.



- -> Unscrew relay carrier -arrows- and lay aside.
- Remove relay carrier cover.
- Remove pin from clevis for brake servo.
- Carefully fold back insulating mat around pedal bracket such that pedal bracket nuts can be unscrewed.
- Unclip fuel pipe on left bulkhead and press slightly in direction of travel.
- Thread out brake servo with brake master cylinder to front and remove.

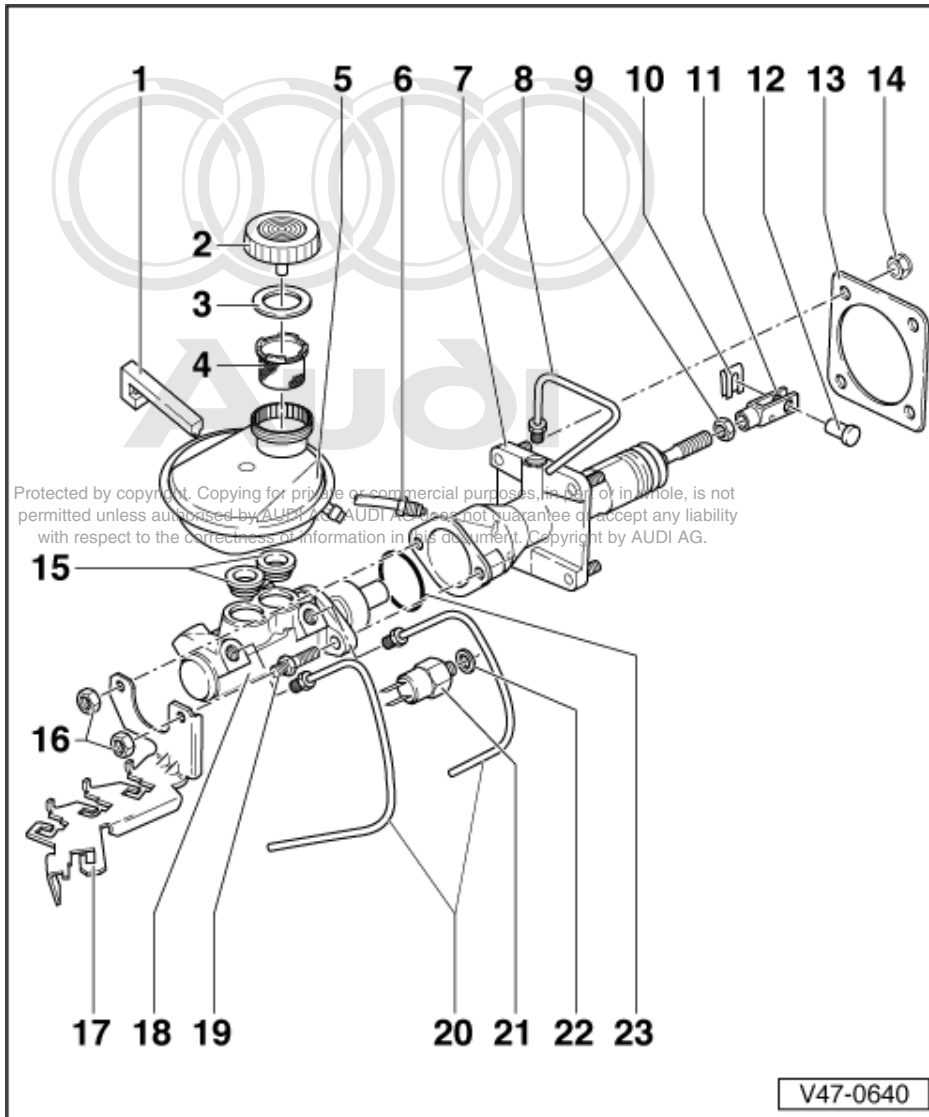
Pay special attention to the following on installation:

- Install brake pipes as indicated on hydraulic unit.
- Insert brake pipes and fuel pipe in holders.
- Bleed braking system => Page 121 and check for leaks



- ◆ Functional test as of 07/92
- With ignition switched on, press firmly by hand on centre of cap (diaphragm). Warning lamp in instrument cluster lights and acoustic alarm sounds.
- ◆ Functional test as of 07/92
- With the ignition switched on, remove the cap and press with your hand on the strainer that is visible. Warning lamp in instrument cluster lights and acoustic alarm sounds.

- 2 Cap
- 3 Gasket
- 4 Strainer



5 Brake fluid reservoir

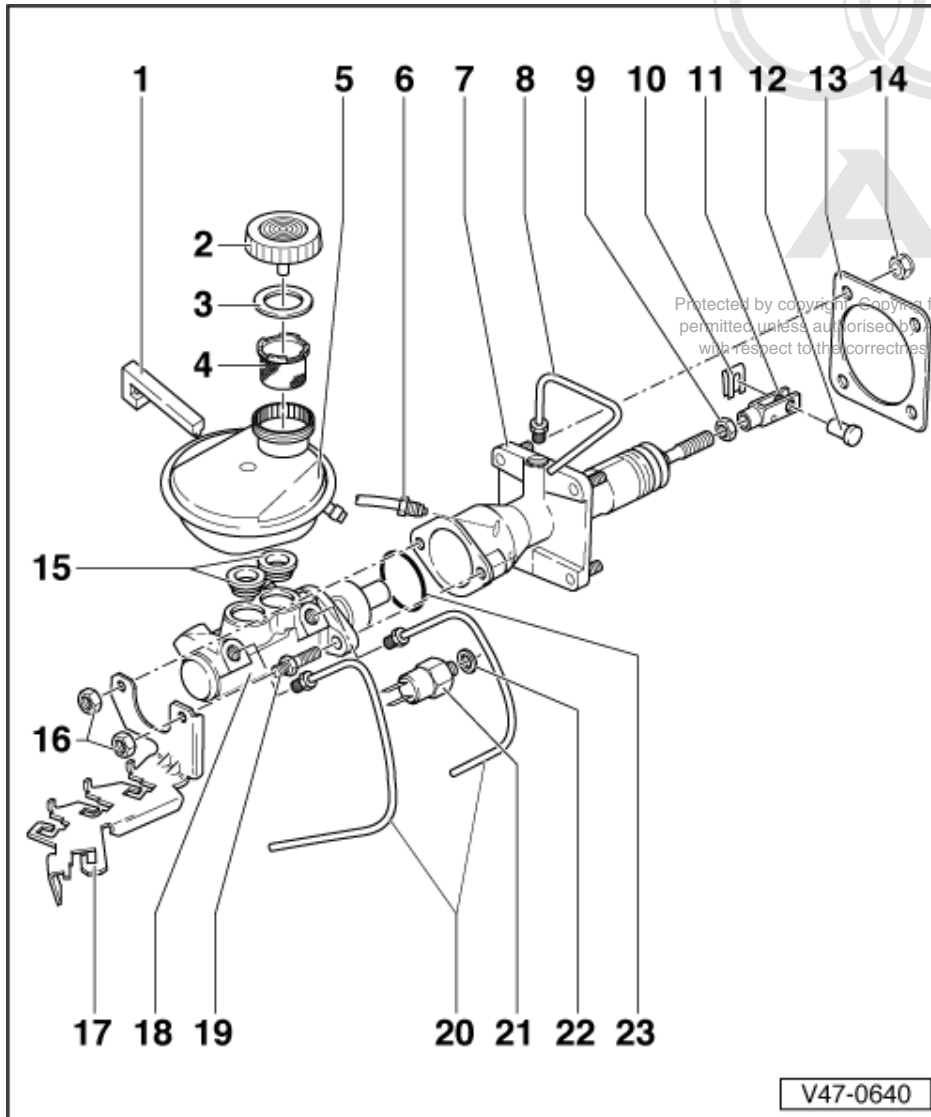
- ◆ Connection for hydraulic coupling is located on side
- ◆ Refer to label on reservoir before topping up brake fluid

6 Pressure pipe

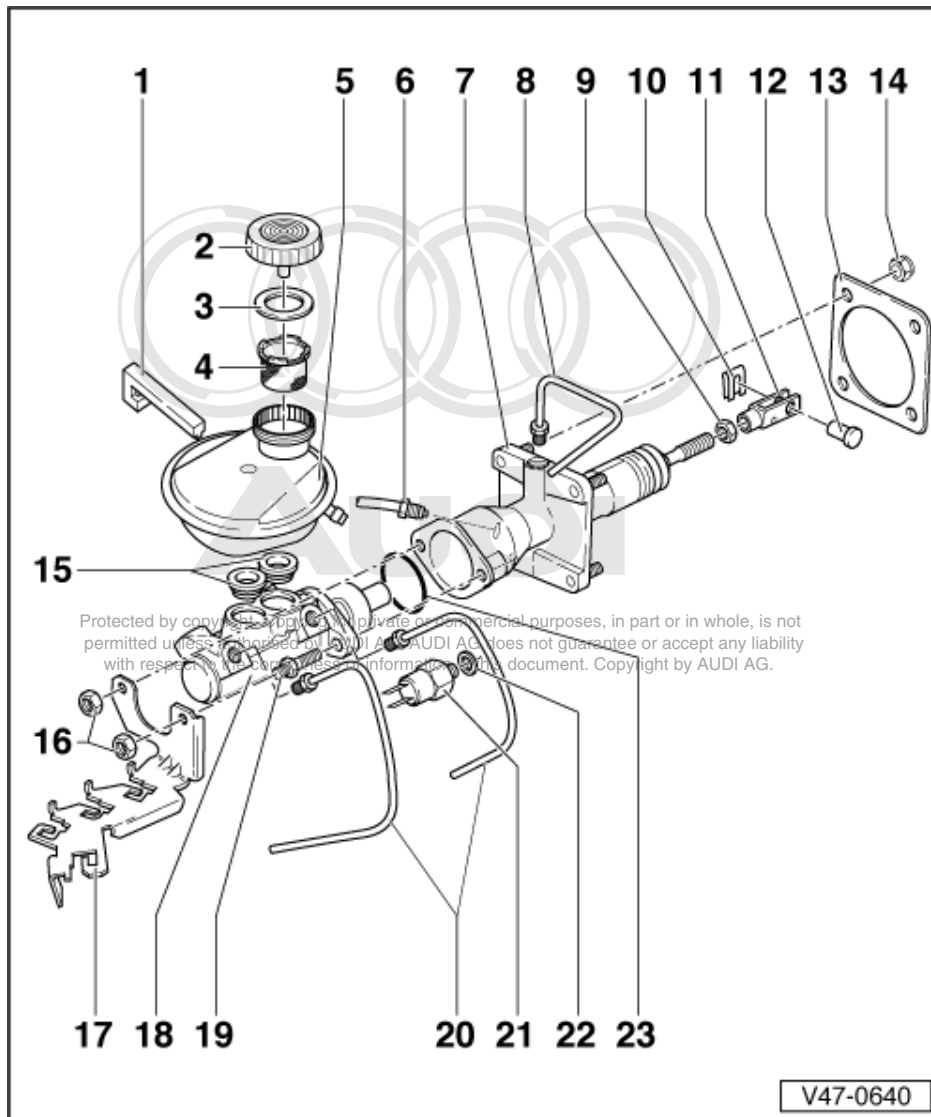
- ◆ Pressure reservoir/brake servo
- ◆ Before unscrewing, dissipate operating pressure by pressing brake pedal 20 times with engine switched off

7 Hydraulic brake servo

- ◆ Never press brake pedal with brake master cylinder removed
- ◆ Leak test => Fig. 2



- 8 Return pipe**
- 9 Nut**
- 10 Locking clip**
 - ♦ Replace
- 11 Clevis**
 - ♦ adjusting => Fig. 1
- 12 Pin**
 - ♦ Grease lightly
- 13 Gasket**
 - ♦ Replace
- 14 Self-locking nut, 25 Nm**
 - ♦ Renew each time after removing
- 15 Sealing plug**
 - ♦ Moisten with brake fluid and insert into brake master cylinder
- 16 Nut, 20 Nm**



17 Bracket

18 Brake master cylinder, ø 25.4mm

- ♦ Cannot be repaired. If faulty, renew complete.

19 Double bolt

20 Brake pipes

21 Oil pressure switch, 20 Nm

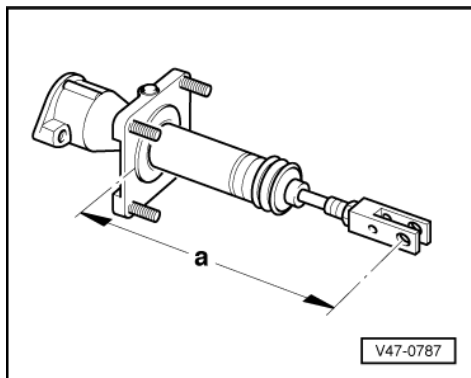
- ♦ For monitoring hydraulic brake servo
- ♦ Drop in pressure to between 127 and 87 bar causes lamp in dash panel insert and warning signal to sound

22 Oil seal

- ♦ Replace

23 Oil seal

- ♦ Replace



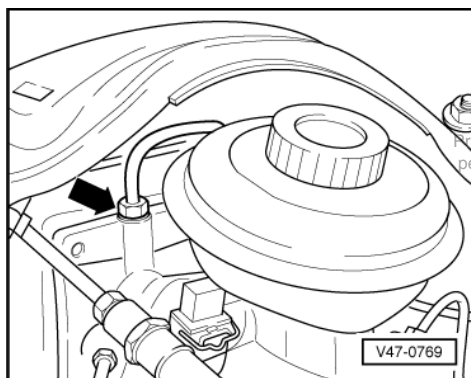
-> Fig.1 Adjusting clevis

$a = 230 \text{ mm} \pm 0.5 \text{ mm}$, LHD

$a = 233 \text{ mm} \pm 0.5 \text{ mm}$, RHD

Note:

- ♦ When measuring, the clevis should be aligned at right angles to the surface of the brake servo unit.
- ♦ Measure without gasket as far as centre of hole in clevis.



-> Fig.2 Checking brake servo for leaks

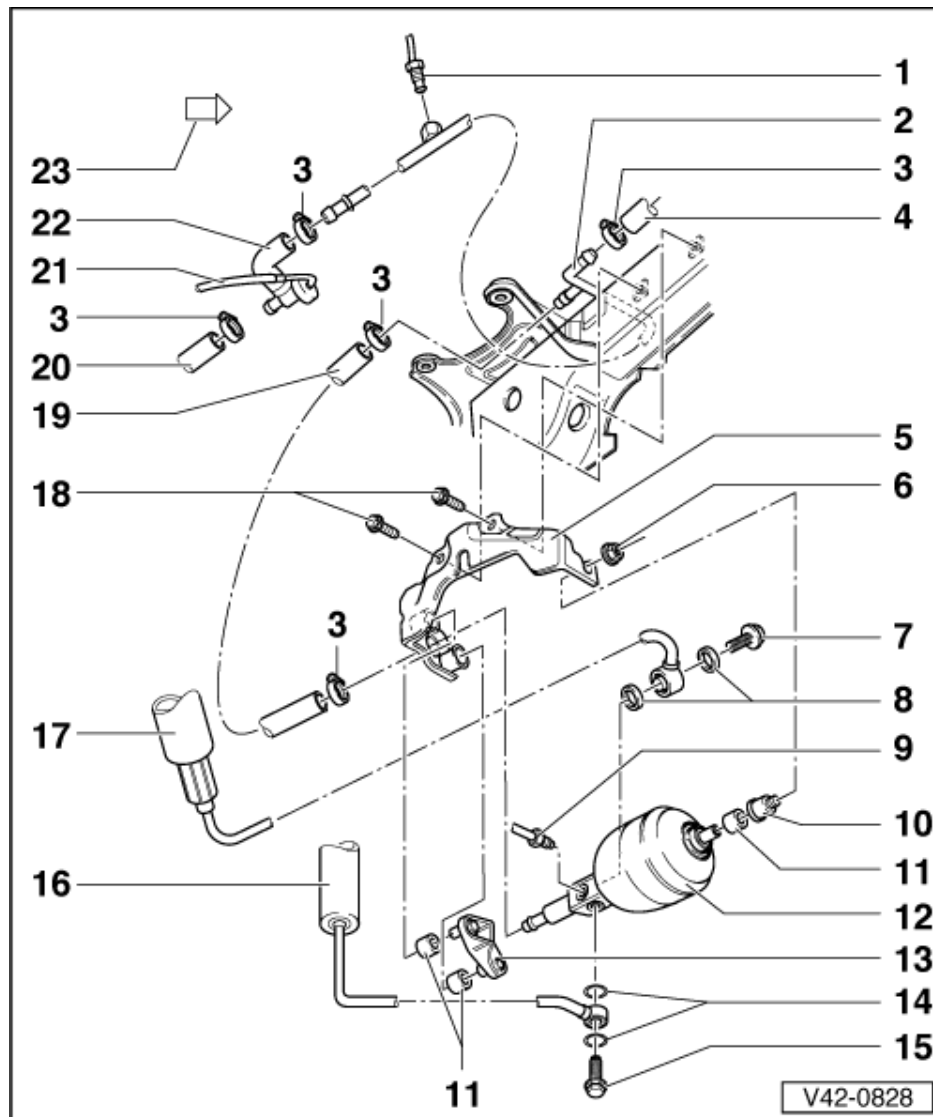
- Unscrew return pipe from brake servo.

Note:

- ♦ Hydraulic fluid will emerge from return pipe if brake servo is defective -arrow-.
- ♦ Dribbling hydraulic fluid has no significance.

10 - Removing and installing pressure reservoir for hydraulic brake servo

10.1 - Removing and installing pressure reservoir for hydraulic brake servo

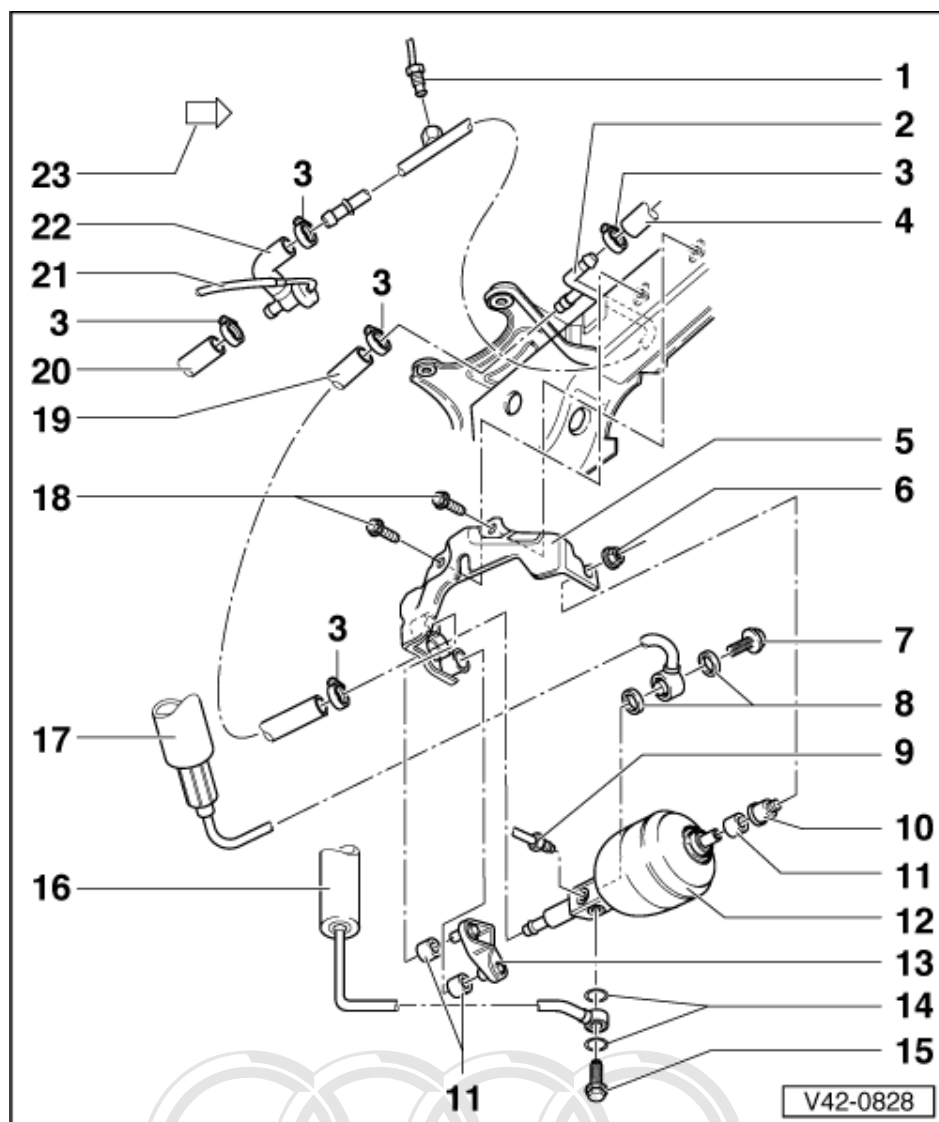


Note:

- ◆ Hydraulic fluid: Part no. G 002 000
- ◆ The brake servo system is bled automatically whilst driving.
- ◆ As final step, check fluid level.

- 1 Return pipe, 10 Nm**
 - ◆ Brake servo/return flow collector
- 2 Return flow collector**
- 3 Clip**
- 4 Return pipe**
 - ◆ Fluid cooler/return flow collector

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**5 Bracket****6 Self-locking nut, 10 Nm****7 Banjo bolt, 25 Nm**

- ◆ Renew each time after removing
- ◆ Vehicles with self-levelling suspension only

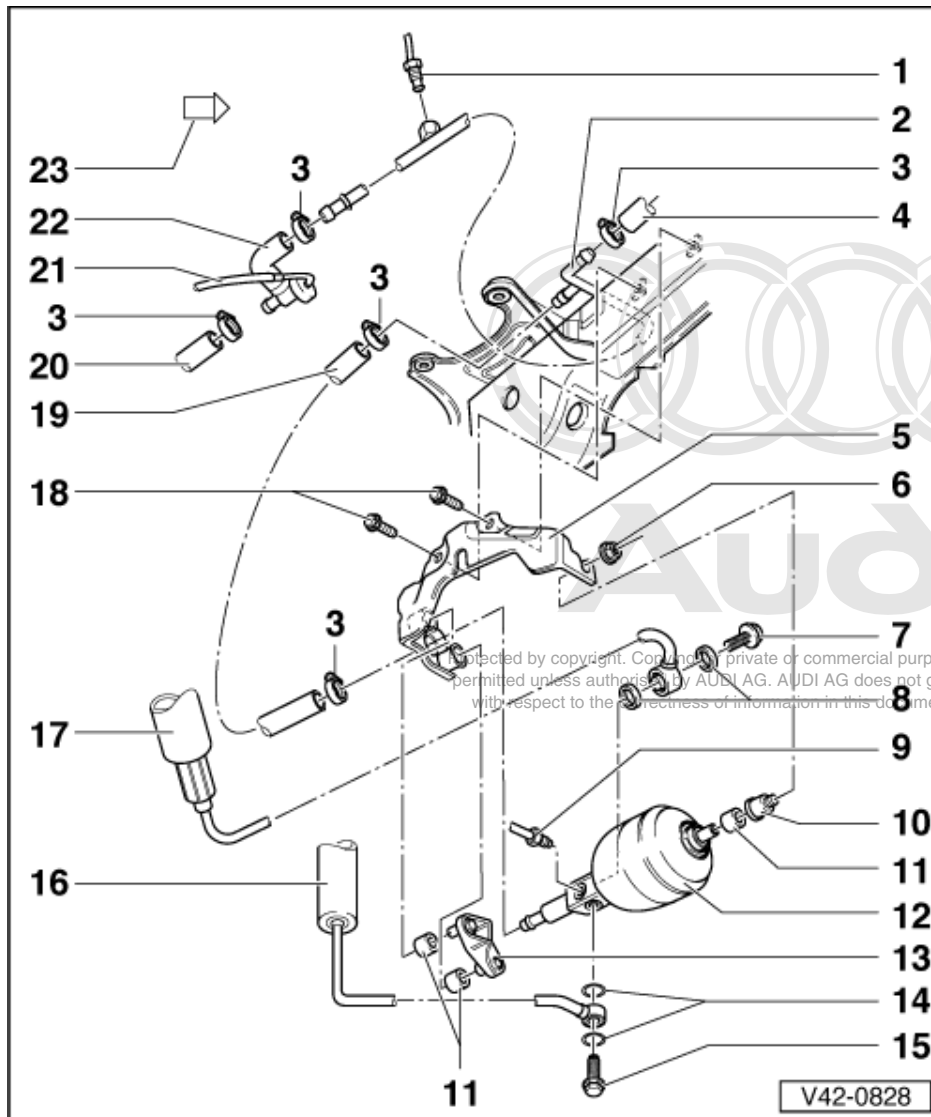
8 Oil seal

- ◆ Renew each time after removing
- ◆ Vehicles with self-levelling suspension only

9 Pressure pipe

- ◆ Pressure reservoir/brake servo
- ◆ Before unscrewing, dissipate operating pressure by pressing brake pedal 20 times with engine switched off

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10 Bush

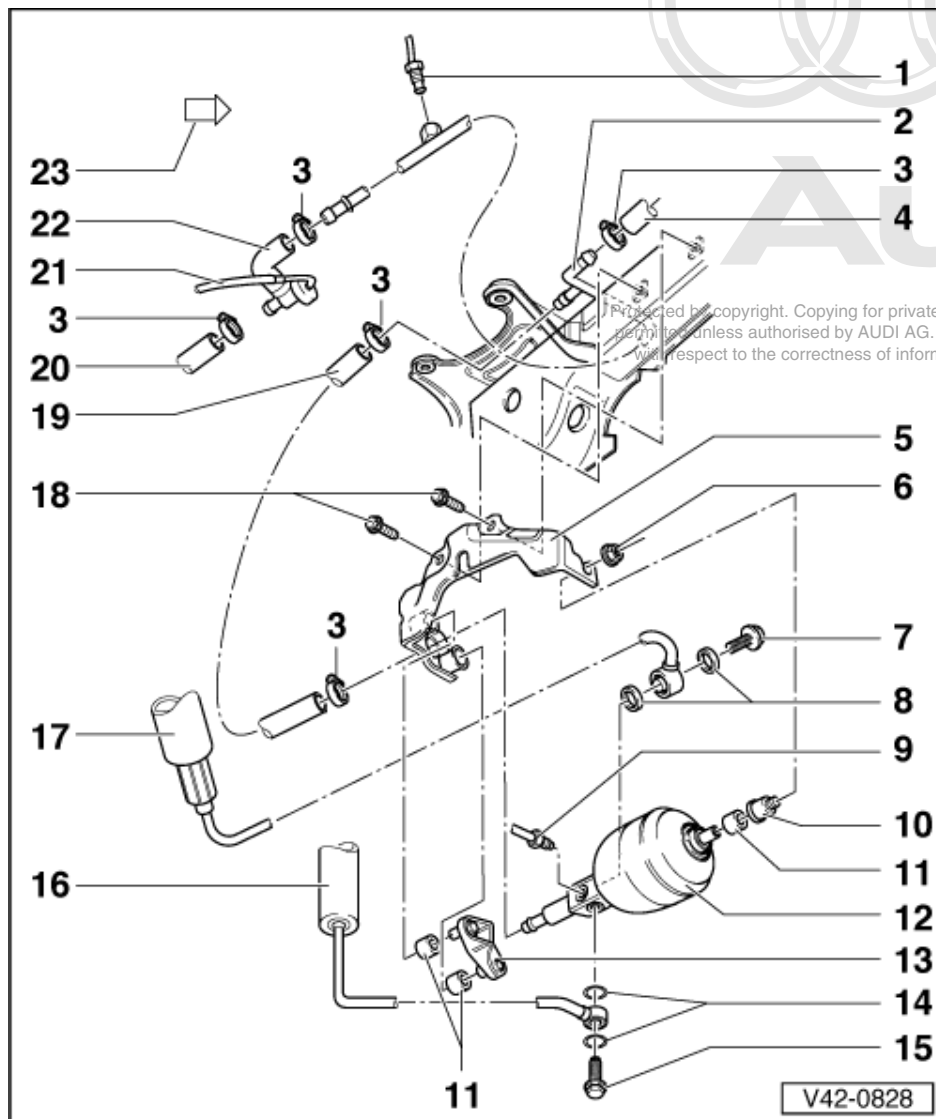
11 Buffer

12 Pressure reservoir for hydraulic brake servo

- ♦ With integrated non-return and pressure relief valve
- ♦ Before removing, dissipate operating pressure by pressing brake pedal 20 times with engine switched off
- ♦ Disposal

=> Running gear special information No. 2

- ♦ Checking charge pressure =>Page 150
- ♦ Checking pressure relief valve =>Page 150
- ♦ Checking non-return valve => Page 151
- ♦ Remove plug when fitting new sealing plug



13 Mounting

14 Oil seal

- ♦ Renew each time after removing

15 Banjo bolt, 25 Nm

- ♦ Renew each time after removing

16 High-pressure hose

- ♦ Tandem pump/pressure reservoir

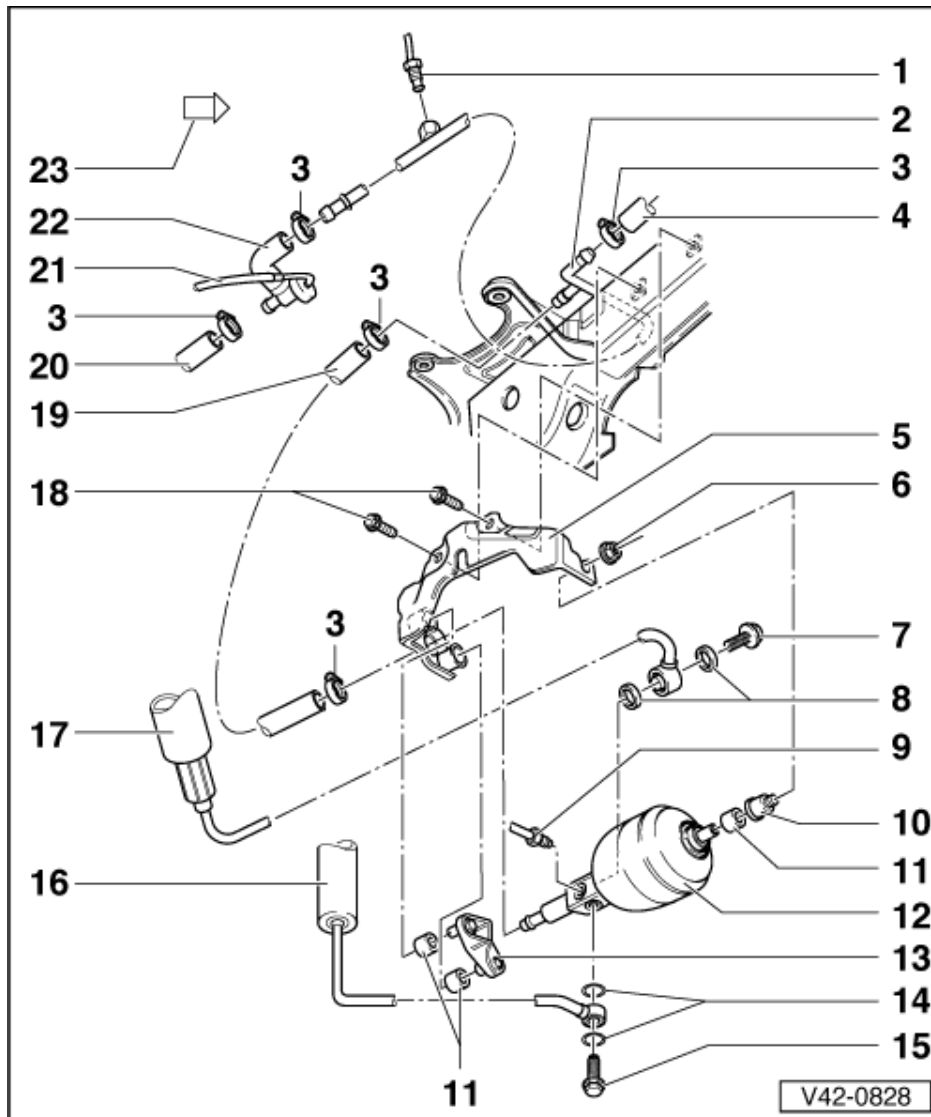
17 Expansion hose

- ♦ Pressure reservoir/control valve
- ♦ Vehicles with self-levelling suspension only

18 Hexagon bolt, 35 Nm

19 Return pipe

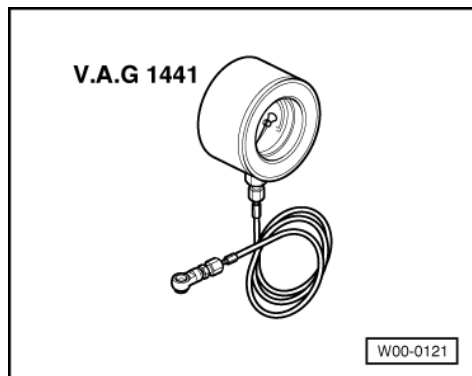
- ♦ Pressure reservoir/return flow collector



- 20 Return pipe
 ♦ Rotary slide valve housing/manifold
- 21 Return pipe
 ♦ Control valve/manifold
- 22 Mainfold
- 23 Direction of travel

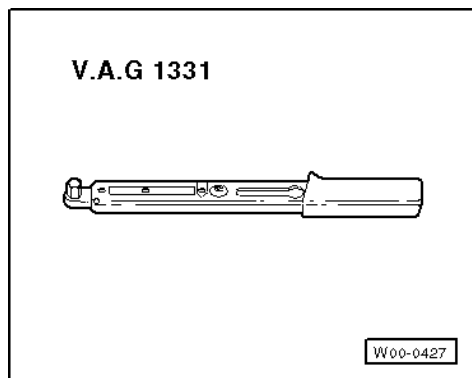
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10.2 - Checking operating pressure of hydraulic brake servo system



Special tools and workshop equipment required

- ♦ V.A.G 1441 Tester for central hydraulics

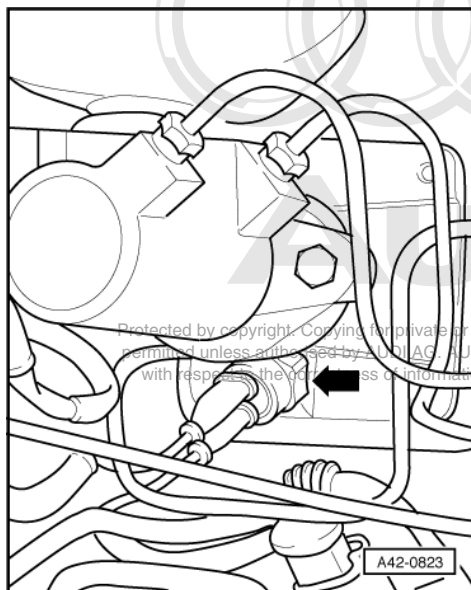


- ♦ V.A.G 1331 Torque wrench

Test requirements:

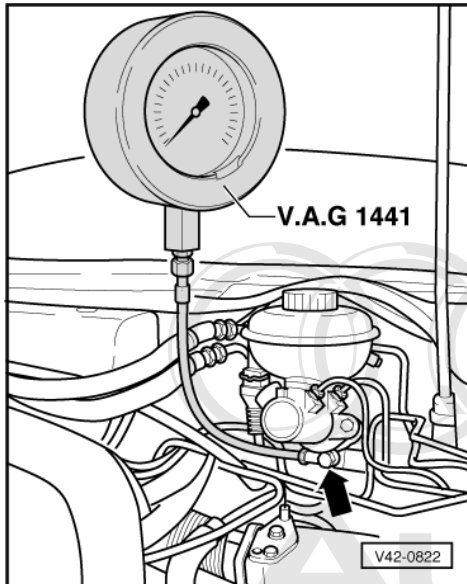
- No leaks in brake servo system.
- Dissipate operating pressure by pressing brake pedal 20 times with engine switched off

Note:



Operating pressure has been dissipated when extremely high back pressure is felt at brake pedal and brake pedal travel is noticeably shorter.

- -> Pull pipes off oil pressure switch -arrow-.
- Unscrew oil pressure switch.



- -> Connect central hydraulics tester V.A.G 1441 to brake servo -arrow-.

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Place thick sealing ring between brake servo and union; thin sealing ring between union and banjo bolt.

- Start engine.
- Leave engine idling.

The operating pressure should rise to at least 140 bar.

If the operating pressure of 140 bar is not reached:

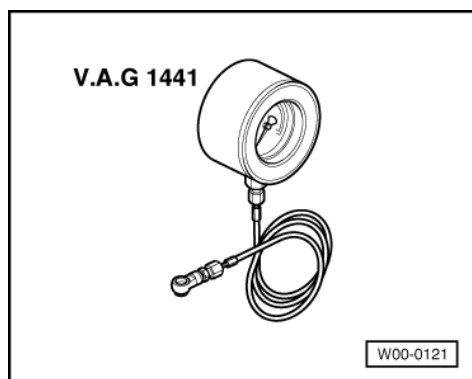
- Switch off ignition.
- Check fuel pump delivery rate
- Pressure relief valve in reservoir is defective if plunger pump is OK.
- Replace pressure reservoir for brake servo => Page 143
- Test operating pressure again as a check.

Note:

Before unscrewing central-hydraulics tester V.A.G 1441, dissipate operating pressure by pressing brake pedal 20 times.

- Unscrew central-hydraulics tester V.A.G 1441 and screw on (20 Nm) oil-pressure switch.
- Check hydraulic fluid level and top up if necessary.

10.3 - Checking charge pressure of pressure reservoir



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Special tools, testers and workshop equipment required

- ♦ V.A.G 1441 Tester for central hydraulics

As new charge pressure: 73-77 bar at 20°C.

Minimum charge pressure: -30 bar at 20°C.

- Connect central hydraulics tester V.A.G 1441 to brake servo => Page 149 .
- Start engine.
- Leave engine idling.

The operating pressure should rise to at least 140 bar.

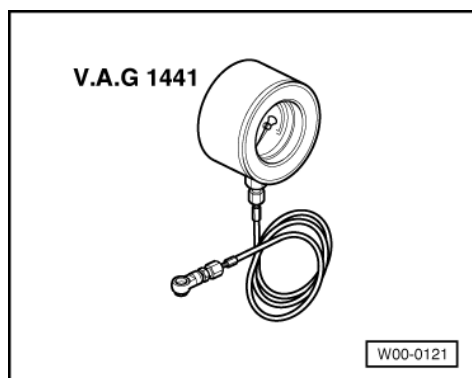
- Switch off ignition.
- Keep pumping with brake pedal until pointer of pressure gauge slowly starts to drop.
- Charge pressure of pressure reservoir is indicated by slowly dropping pointer falling abruptly to 0 bar.
- Replace pressure reservoir if charge pressure is less than 30 bar => Page 143 .

Note:

Before unscrewing central-hydraulics tester V.A.G 1441, dissipate operating pressure by pressing brake pedal 20 times.

- Unscrew central-hydraulics tester V.A.G 1441 and screw on (20 Nm) oil-pressure switch.
- Check hydraulic fluid level and top up if necessary.

10.4 - Checking pressure relief valve of pressure reservoir



Special tools and workshop equipment required

- ♦ V.A.G 1441 Tester for central hydraulics

Test requirements

- Plunger pump delivery rate must be at least 0,2 l/min with engine idling.
- Connect central hydraulics tester V.A.G 1441 to brake servo => Page 149 .
- Start engine.
- Leave engine idling.

The operating pressure should rise to at least 140 bar.

- Switch off ignition.
- Replace pressure reservoir if charge pressure of 140 bar is not reached => Page 143 .
- Test operating pressure again as a check.

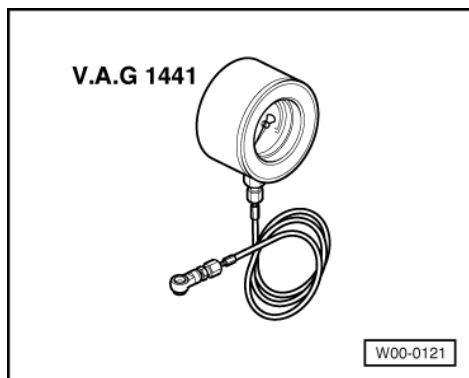
Note:

Before unscrewing central-hydraulics tester V.A.G 1441, dissipate operating pressure by pressing brake pedal 20 times.

- Unscrew central-hydraulics tester V.A.G 1441 and screw on (20 Nm) oil-pressure switch.
- Check hydraulic fluid level and top up if necessary.

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10.5 - Checking non-return valve of pressure reservoir



Special tools and workshop equipment required

- ♦ V.A.G 1441 Tester for central hydraulics

Test requirements:

- No leaks in brake servo.
- Connect central hydraulics tester V.A.G 1441 to brake servo => Page 149 .
- Start engine.
- Leave engine idling.

The operating pressure should rise to at least 140 bar.

- Switch off ignition.
- Dissipate pressure to approx. 135 bar by pressing brake pedal several times.



Pressure may drop to max. 130 bar after approx. 5 minutes.

- Replace pressure reservoir in the event of greater drop in pressure => Page **143** .

Note:

Before unscrewing central-hydraulics tester V.A.G 1441, dissipate operating pressure by pressing brake pedal 20 times.

- Unscrew central-hydraulics tester V.A.G 1441 and screw on (20 Nm) oil-pressure switch.
- Check hydraulic fluid level and top up if necessary.

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