



## Workshop Manual Golf Variant 2007 ➤ Jetta 2005 ➤

### Brake systems

Edition 12.2009





## List of Workshop Manual Repair Groups

### Repair Group

- 00 - Technical data
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- 46 - Brakes - mechanism
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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 Brake allocation via PR number

The type of brake system installed in the vehicle is indicated among other things by the corresponding PR number on the vehicle data sticker.

#### Example of a vehicle data sticker:

In this example, the 1ZE front brake -arrow- is installed in the vehicle.



#### Note

*The PR number of the rear brake is not on the vehicle data sticker. To find information about the rear brake, please search in ELSA/ Vehicle-specific notes.*

V.I.N.WVWZZZ1KZ8M316593	
N.I.V.GOLF VAR 2.0	SPORT 103ITDIM6F
Type 1K5262	
Eng. code/Trans. code	<b>BMM KDN</b>
Code moteur/boite vit.	
Paint No./Interior	<b>LC9X UL 0387</b>
N°peint/Int.	
Options	X0A CM5 G0K HH7 J0N K8D 4UF D7N U5A
1ZE V0A 0A2 1AT 166 1MN 2JC 5RR	
7K6 5SL 0NM 4XS 766 3L3 ST2 RG1 3VR 4A3 8BG	
G68 8AG B0A 1NS 3FU 4KS 4R4 8Y1 8ZN 9AK	
M00-0170	

The vehicle data sticker can be found in the spare wheel well and in the service schedule.

- ◆ Allocation ⇒ Electronic Parts Catalogue "ETKA" .
- ◆ The following tables explain the PR numbers. These are important for the brake caliper/brake disc and brake pads.

#### 1.1 Front brakes, Jetta

Engine	PR number	Front brakes
1.6 I - 75 kW	1ZM	FS III (15")
1.6 I - 85 kW		
1.9 I - 77 kW TDI unit injector	1ZE	FN 3 (15")
1.4 I - 90 kW		
1.4 I - 103 kW		
2.0 I - 100 kW TDI		
2.0 I - 103 kW TDI		
2.0 I - 110 kW FSI	1LJ	FN 3 (16")
1.4 I - 125 kW		
2.0 I - 125 kW TDI		
2.0 I - 147 kW T-FSI		

#### 1.2 Front brakes, Jetta, North America

Engine	PR number	Front brakes
1.9 I - 74 kW TDI unit injector	1ZP	FN 3 (15")
2.5 I - 110 kW		
2.5 I - 125 kW		
2.0 I - 103 kW TDI	1ZD / 1LV	FN 3 (16")
2.0 I - 147 kW T-FSI		

#### 1.3 Front brakes, Jetta, Japan

Engine	PR number	Front brakes
1.4 I - 90 kW	1ZP	FN 3 (15")



Engine	PR number	Front brakes
2.0 I - 110 kW FSI		
2.0 I - 125 kW TDI	1ZD	FN 3 (16")
2.5 I - 125 kW	1ZP	FN 3 (15")
1.4 I - 125 kW	1ZD	FN 3 (16")
2.0 I - 147 kW T-FSI	1ZD / 1LV	FN 3 (16")

#### 1.4 Front brakes, Bora, Mexico

Engine	PR number	Front brakes
2.5 I - 110 kW	1ZE	FN 3 (15")
2.5 I - 125 kW		
2.0 I - 147 kW T-FSI	1ZD / 1LL	FN 3 (16")

#### 1.5 Front brakes, Golf Variant model year 2008

Engine	PR number	Front brakes
1.4 I - 59 kW	1ZM	FS III (15")
1.6 I - 75 kW		
1.9 I - 77 kW TDI unit injector, front-wheel drive		
1.4 I - 90 kW	1ZE	FN 3 (15")
1.4 I - 103 kW		
2.0 I - 100 kW TDI		
2.0 I - 103 kW TDI		
1.9 I - 77 kW TDI unit injector, 4Motion	1LJ	FN 3 (16")
1.4 I - 125 kW		
2.0 I - 147 kW T-FSI		

#### 1.6 Front brakes, Golf Variant from model year 2009

Engine	PR number	Front brakes
1.4 I - 59 kW	1ZM	FS III (15")
1.6 I - 75 kW		
1.9 I - 77 kW TDI unit injector, front-wheel drive		
1.4 I - 90 kW	1ZE	FN 3 (15")
1.4 I - 103 kW		
2.0 I - 100 kW TDI	1LJ	FN 3 (16")
2.0 I - 103 kW TDI		
2.0 I - 125 kW TDI		
1.9 I - 77 kW TDI unit injector, 4Motion		
1.4 I - 118 kW		
1.4 I - 125 kW		
2.0 I - 147 kW T-FSI		



## 1.7 Front brakes, Jetta SportWagen as of model year 2008 (USA)

Engine	PR number	Front brakes
2.5 l/125 kW	1ZP	FN 3 (15")
2.0 l 103 kW TDI	1ZD / 1LV	FN 3 (16")
2.0 l - 147 kW T-FSI		

## 1.8 Rear brakes, Jetta up to week 50/2009

Engine	PR number	Rear brakes
1.6 l - 75 kW	1KF	CII 41 (15")
1.6 l - 85 kW		
1.9 l - 77 kW TDI unit injector		
1.4 l - 90 kW		
1.4 l - 103 kW		
2.0 l - 100 kW TDI		
2.0 l - 103 kW TDI		
2.0 l - 110 kW FSI	1KJ	CII 41 (16")
1.4 l - 125 kW		
2.0 l - 125 kW TDI		
2.0 l - 147 kW T-FSI		

## 1.9 Rear brakes, Jetta as of week 50/2009

Engine	PR number	Rear brakes
1.6 l - 75 kW	1KT	Bosch
1.6 l - 85 kW		
1.9 l - 77 kW TDI unit injector		
1.4 l - 90 kW		
1.4 l - 103 kW		
2.0 l - 100 kW TDI		
2.0 l - 103 kW TDI		
2.0 l - 110 kW FSI		
1.4 l - 125 kW		
2.0 l - 125 kW TDI		
2.0 l - 147 kW T-FSI		

## 1.10 Rear brakes, Jetta, North America, up to week 50/2009

Engine	PR number	Rear brakes
1.9 l - 74 kW TDI unit injector	1KE	CII 41 (15")
2.0 l - 103 kW TDI		
2.5 l - 110 kW		
2.5 l - 125 kW		
2.0 l - 147 kW T-FSI Sport	1KJ	CII 41 (16")
2.0 l - 103 kW TDI Sport	1KV	CII 38 (16")



Engine	PR number	Rear brakes
2.0l - 147 kW T-FSI Jetta GLI only	1KY / 1KV	CII 38 (16")

### 1.11 Rear brakes, Jetta, North America, as of week 50/2009

Engine	PR number	Rear brakes
1.9 l - 74 kW TDI unit injector	1KS	Bosch
2.0 l - 103 kW TDI		
2.5 l - 110 kW		
2.5 l - 125 kW		
2.0l - 147 kW T-FSI Sport		
2.0l - 103 kW TDI Sport		
2.0 l - 147 kW T-FSI Jetta GLI only		

### 1.12 Rear brakes, Bora, Mexico, up to week 50/2009

Engine	PR number	Rear brakes
2.5 l - 110 kW	1KD	C 38 (15")
2.5 l - 125 kW	1KF	CII 41 (15")
2.0 l - 147 kW T-FSI	1KY	CII 41 (16")

### 1.13 Rear brakes, Bora, Mexico, as of week 50/2009

Engine	PR number	Rear brakes
2.5l - 110 kW	1KD	C 38 (15")
2.5l - 125 kW	1KS	Bosch
2.0l - 147 kW T-FSI		

### 1.14 Rear brakes, Jetta, Japan, up to week 50/2009

Engine	PR number	Rear brakes
1.4 l - 90 kW	1KE	CII 41 (15")
2.0 l - 110 kW FSI		
2.0 l - 125 kW TDI		
2.5 l - 125 kW		
1.4 l - 125 kW		
2.0 l - 147 kW T-FSI Sport		
2.0l - 147 kW T-FSI GLI	1KV	CII 38 (16")

### 1.15 Rear brakes, Jetta, Japan, as of week 50/2009

Engine	PR number	Rear brakes
1.4l - 90 kW	1KS	Bosch



Engine	PR number	Rear brakes
2.0I - 110 kW FSI		
2.0I - 125 kW TDI		
2.5I - 125 kW		
1.4I - 125 kW		
2.0I - 147 kW T-FSI Sport		
2.0I - 147 kW T-FSI GLI		

### 1.16 Rear brakes, Golf Variant from model year 2008

Engine	PR number	Rear brakes
1.4 I - 59 kW	1KF	CII 41 (15")
1.6 I - 75 kW		
1.9 I - 77 kW TDI unit injector front-wheel drive and 4Motion		
1.4 I - 90 kW		
1.4 I - 103 kW		
2.0 I - 100 kW TDI		
2.0 I - 103 kW TDI		
1.4 I - 125 kW	1KJ	CII 41 (16")
2.0 I - 147 kW T-FSI		

### 1.17 Rear brakes, Golf Variant from model year 2009

Engine	PR number	Rear brakes
1.4 I - 59 kW	1KF	CII 41 (15")
1.6 I - 75 kW		
1.9 I - 77 kW TDI unit injector front-wheel drive and 4Motion		
1.4 I - 90 kW		
1.4 I - 103 kW		
2.0 I - 100 kW TDI	1KJ	CII 41 (16")
2.0 I - 103 kW TDI		
2.0 I - 125 kW TDI		
1.4 I - 118 kW		
1.4 I - 125 kW		
2.0 I - 147 kW T-FSI		

### 1.18 Rear brakes, Jetta SportWagen as of model year 2009 (USA)

Engine	PR number	Rear brakes
2.5 I/125 kW	1KE	CII 41 (15")
2.0 I 103 kW TDI	1KJ	CII 41 (16")
2.0 I - 147 kW T-FSI		



## 2 Technical data for brakes

### 2.1 Brake master cylinder and brake servo

1.4 I - 59 kW; 1.6 I - 75 kW; 1.6 I - 85 kW; 1.9 I - 77 kW TDI unit injector front-wheel drive; 1.9 I - 74 kW TDI unit injector; 1.4 I - 90 kW; 2.5 I - 110 kW

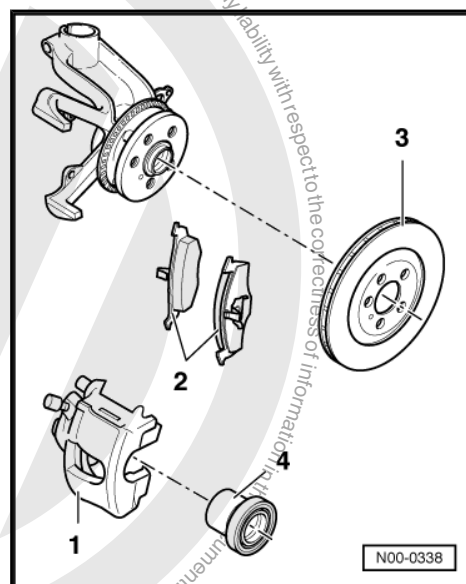
Brake master cylinder	Ø in mm	22.2
Brake servo (LHD)	Ø in inches	10
Brake servo (RHD)	Ø in inches	7/8

1.9I - 77 kW TDI unit injector 4Motion; 1.4I - 118 kW; 1.4I - 125 kW; 2.0I - 125 kW TDI; 2.0I - 147 kW T-FSI; 2.5I - 125 kW; 1.4I - 103 kW; 2.0I - 100 kW TDI; 2.0I - 103 kW TDI; 2.0I - 110 kW FSI

Brake master cylinder	Ø in mm	23.8
Brake servo (LHD)	Ø in inches	10
Brake servo (RHD)	Ø in inches	7/8

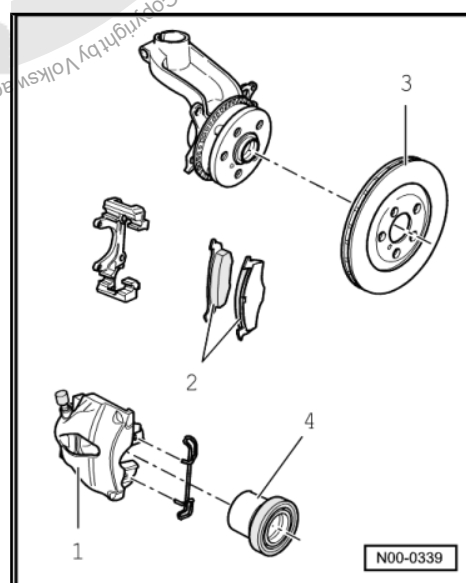
### 2.2 Front brakes FS III

Item	PR number		1ZM / 1ZF
1	Brake caliper		FS III (15")
2	Brake pad, thickness without backplate	mm	14
3	Brake disc	Ø in mm	280
	Brake disc, thickness	mm	22
4	Brake caliper piston	Ø in mm	54



### 2.3 Front brakes FN 3 (15")

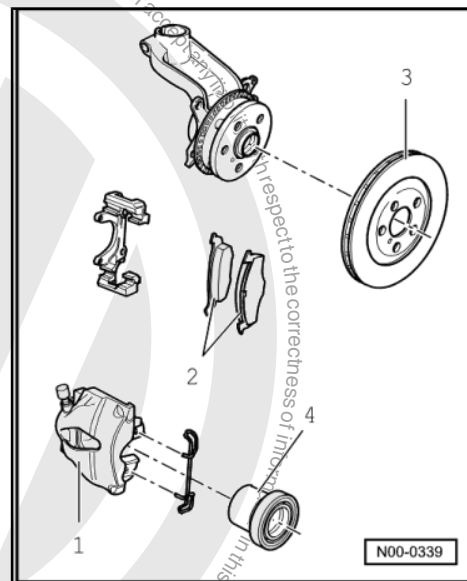
Item	PR number		1ZE / 1ZP
1	Brake caliper		FN3 (15")
2	Brake pad, thickness without backplate	mm	14
3	Brake disc	Ø in mm	288
	Brake disc, thickness	mm	25
4	Brake caliper piston	Ø in mm	54





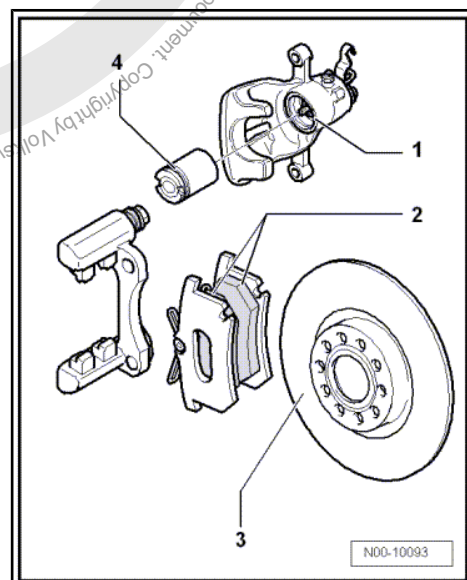
## 2.4 Front brakes FN 3 (16")

Item	PR number		1LL / 1ZD / 1LV / 1LJ
1	Brake caliper		FN3 (16")
2	Brake pad, thickness with-out backplate	mm	14
3	Brake disc	Ø in mm	312
	Brake disc, thickness	mm	25
4	Brake caliper piston	Ø in mm	54



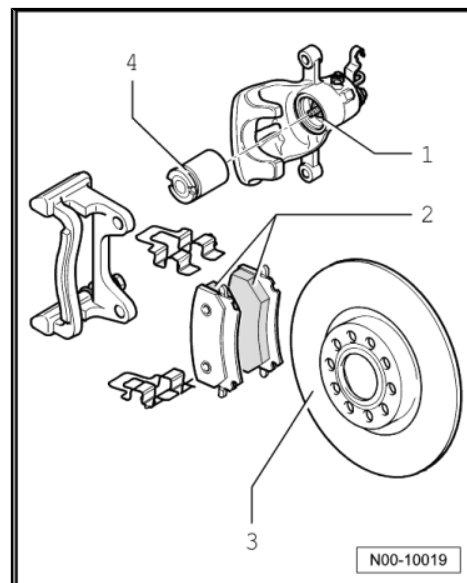
## 2.5 Rear brakes C 38

Item	PR number		1KD
1	Brake caliper		C 38 (15")
2	Brake pad, thickness with-out backplate	mm	11
3	Brake disc	Ø in mm	255
	Brake disc, thickness	mm	10
4	Brake caliper piston	Ø in mm	38



## 2.6 Rear brakes CII 38

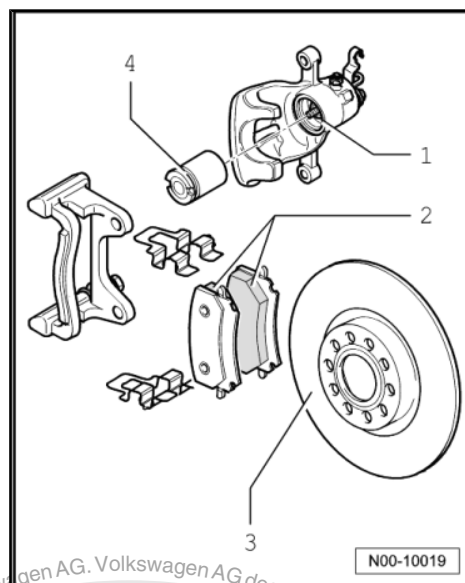
Item	PR number		1KY / 1KV
1	Brake caliper		CII 38 (16")
2	Brake pad, thickness with-out backplate	mm	11
3	Brake disc	Ø in mm	286
	Brake disc, thickness	mm	12
4	Brake caliper piston	Ø in mm	38





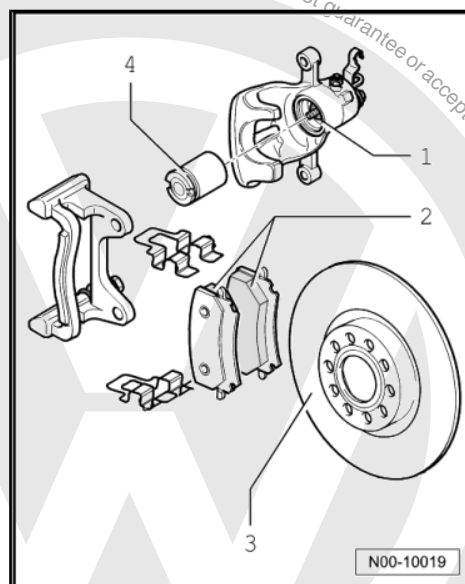
## 2.7 Rear brake CII 41 (15")

Item	PR number		1KE / 1KF
1	Brake caliper		CII 41 (15")
2	Brake pad, thickness without backplate	mm	11
3	Brake disc	Ø in mm	260
	Brake disc, thickness	mm	12
4	Brake caliper piston	Ø in mm	41



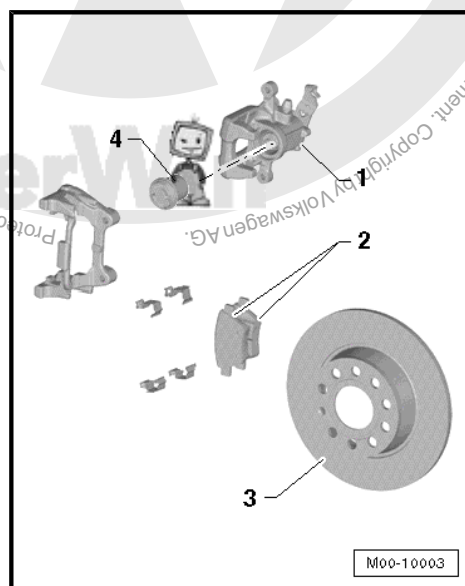
## 2.8 Rear brake CII 41 (16")

Item	PR number		1KJ
1	Brake caliper		CII 41 (16")
2	Brake pad, thickness without backplate	mm	11
3	Brake disc	Ø in mm	286
	Brake disc, thickness	mm	12
4	Brake caliper piston	Ø in mm	41



## 2.9 Rear brakes, Bosch

Item	PR number		1KT / 1KS
1	Brake caliper		Bosch
2	Brake pad, thickness without backplate	mm	12
3	Brake disc	Ø in mm	272
	Brake disc, thickness	mm	10
4	Brake caliper piston	Ø in mm	38





## 3 Brake test

### 3.1 General

- ◆ The drive is provided by the roller dynamometer.
- ◆ For the test ensure for vehicles with a manual gearbox that the gear lever is in neutral, and for vehicles with an automatic gearbox that the selector lever is in "N".
- ◆ For test, observe specifications provided by manufacturer of roller dynamometer.



#### Note

*The brake control systems do not function when ignition is "off".*

### 3.2 Test for vehicles with front-wheel drive

The brake test must be performed on a single-axle roller dynamometer.

The maximum test speed must not exceed 6 km/h.

The test rigs authorised by Volkswagen fulfil these requirements.

### 3.3 Test for vehicles with four-wheel drive via a Haldex coupling

**The brake test should be performed on a single-axle roller dynamometer with contra-rotating rollers for four-wheel drive vehicles.**

Contra-rotating means that the dynamometer rollers are driven forwards on one side and backwards on the opposite side.

This prevents brake forces being transferred to the drive train.

The forward rotating wheel is measured during the test, which means two brake tests per axle must be performed.

The maximum test speed must not exceed 6 km/h.

The test rigs authorised by Volkswagen fulfil these requirements.

**If no test rig is available for four-wheel drive vehicles, the brake test can also be carried out on a standard single-axle roller dynamometer as follows:**

- Drive vehicle forwards onto the rollers.
- Switch engine off and wait for 2 seconds.
- Carry out front brake test.
- Start engine and wait for approx. 5 seconds until sufficient vacuum has been built up.
- Drive vehicle forwards until rear wheels are positioned on rollers.
- Switch engine off and wait for 2 seconds.
- Carry out rear brake test.
- Start engine and wait for approx. 5 seconds until sufficient vacuum has been built up.



## 45 – Anti-lock brake system

### 1 General notes on anti-lock brake system

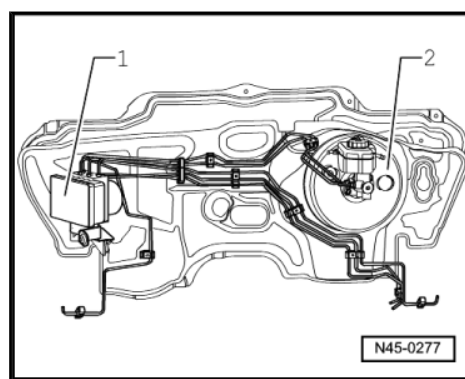
The ABS brake system is divided diagonally. The servo-assistance is effected pneumatically by the vacuum brake servo unit.

Models with ABS Mark 60 do not have a mechanical brake pressure regulator. Specially matched software in the control unit regulates the brake force distribution on the rear axle.

**Faults in the ABS do not influence the brake system and servo assistance. The conventional brake system remains functional even without ABS. A change in braking behaviour is to be reckoned with. After the ABS warning lamp -K47- comes on, the rear wheels may lock prematurely.**

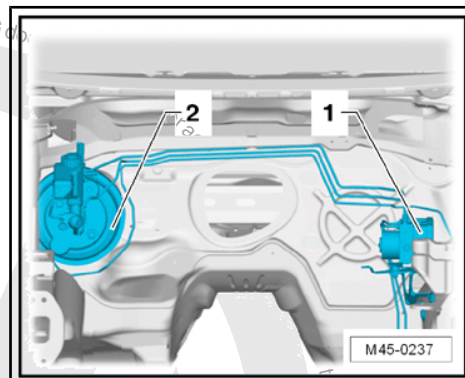
ABS layout in left-hand drive vehicle.

- 1 - Hydraulic unit and control unit
- 2 - Brake servo



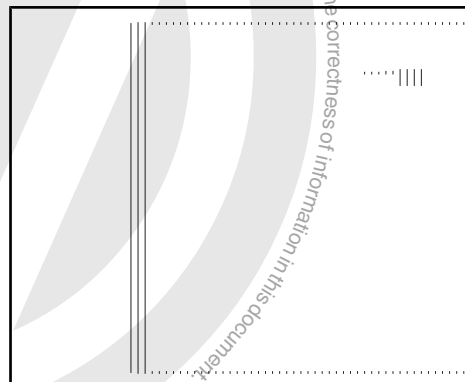
ABS layout in a right-hand drive vehicle.

- 1 - Hydraulic unit and control unit
- 2 - Brake servo



The hydraulic unit -2- and control unit -1- form one component. They can be separated only when removed. Hydraulic pump -3- must not be separated from hydraulic unit.

With ABS/EDL/TCS/ESP - separation is not possible in vehicles with hydraulic brake servo or hill hold assist.





## 2 Notes for repair work on anti-lock brake system

- ◆ Before carrying out repair work on the anti-lock brake system, determine the cause of the fault as well as the control unit code using "Guided Fault Finding".

"Guided Fault Finding" is carried out with the vehicle diagnostic, testing and information system -VAS 5051- .

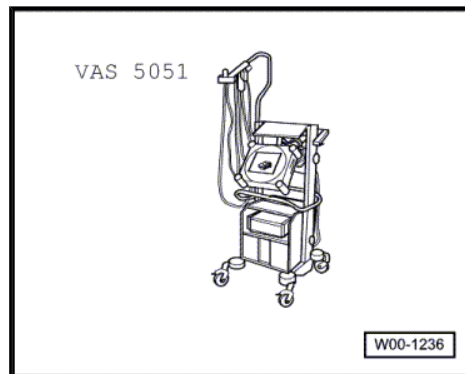
- ◆ Disconnect battery earth strap with ignition switched off.
- ◆ Before carrying out welding work with an electric welding unit, note ⇒ General Information; Body Repairs, General Body Repairs .
- ◆ When working with brake fluid, observe the valid, relevant safety precautions and notes ⇒ [page 131](#) .
- ◆ After work for which the brake system had to be opened, bleed the brake system with brake filling and bleeding equipment - VAS 5234- or -V.A.G 1869- ⇒ [page 131](#) .
- ◆ During the final road test, ensure that a controlled brake test is performed at least once (pulsations must be felt at the brake pedal).
- ◆ Absolute cleanliness is required when working on the anti-lock brake system. It is not permitted to use any products which contain mineral oil, such as oils, greases etc.
- ◆ Thoroughly clean all unions and the adjacent areas before loosening. Do not use aggressive cleaning agents such as brake cleanser, petrol, thinners or similar.
- ◆ Place removed parts on a clean surface and cover.
- ◆ After separating the control unit/hydraulic unit, use the transport protection for the contact pins.
- ◆ If repairs cannot be carried out immediately, carefully cover or seal open components. ( Sealing plugs -1H0 698 311 A- must be used).
- ◆ Only use lint-free cloths.
- ◆ Only unpack replacement parts immediately prior to fitting.
- ◆ Only use genuine packed parts.
- ◆ When the system is open, do not work with compressed air and do not move the vehicle.
- ◆ During painting operations, the electronic control unit can be exposed to a maximum temperature of 95 °C for only a short period, and to a maximum of 85 °C for longer periods (approx. 2 hours). Ensure that no brake fluid enters connectors.



### 3 Connecting -VAS 5051- and selecting functions

#### Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051-

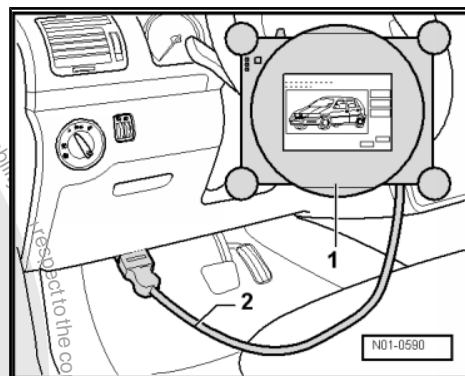


#### WARNING

- ◆ *During a road test, you must always secure testing and measuring equipment on the back seat.*
- ◆ *These devices may be operated only by a passenger while the vehicle is in motion.*

Connect vehicle diagnosis, testing and information system -VAS 5051- -1- as follows:

- Connect connector of diagnosis cable -2- to diagnostic connection.





- Switch on vehicle diagnostic, testing and information system -VAS 5051B- -arrow-.

The vehicle diagnosis, testing and information system -VAS 5051- is ready for operation when the selector buttons for the operating modes appear on the screen.

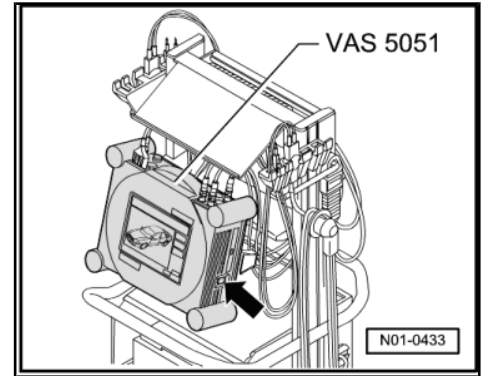
- Switch on ignition.
- Touch **Guided Fault Finding** on screen.
- Select one after another:
  - ◆ Brand
  - ◆ Type
  - ◆ Model year
  - ◆ Body version
  - ◆ Engine code
- Confirm data entered.

Wait until the vehicle diagnosis, testing and information system -VAS 5051- has read all control units in the vehicle.

- Press **→**.
- Press **Go to** and select function “Function/component selection”.
- Select “Running gear” on display.
- Select “Brake systems” on display.
- Select “01 Self-diagnosis capable system ...” shown on display.
- Select “Anti-lock brake system ...” shown on display.
- Select “Function” shown on display.

Now all possible functions from the anti-lock brake system installed in the vehicle will be displayed.

- Select desired function on display.



## 4 Electrical/electronic components and locations

### 4.1 ABS Mark 70 (ABS/TCS)

#### 1 - ABS control unit -J104-

- ☐ Location: on the hydraulic unit on right in engine compartment.
- ☐ Can be tested in "Guided fault finding" using -VAS 5051-
- ☐ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before separating connector.
- ☐ Removing and installing ⇒ [page 29](#) .

#### 2 - ABS hydraulic unit -N55-

- ☐ Location: on right in engine compartment.

The hydraulic unit consists of the components:

- ☐ ABS hydraulic pump - V64-
- ☐ Can be tested in "Guided fault finding" using -VAS 5051-
- ☐ Valve block (contains inlet and outlet valves).
- ☐ ABS hydraulic pump - V64- and valve block must not be separated from one another.
- ☐ Removing and installing ⇒ [page 29](#) .

#### 3 - Brake pad warning lamp - K32-

- ☐ Location: in dash panel insert
- ☐ Function: ⇒ [page 20](#) .

#### 4 - ABS warning lamp -K47-

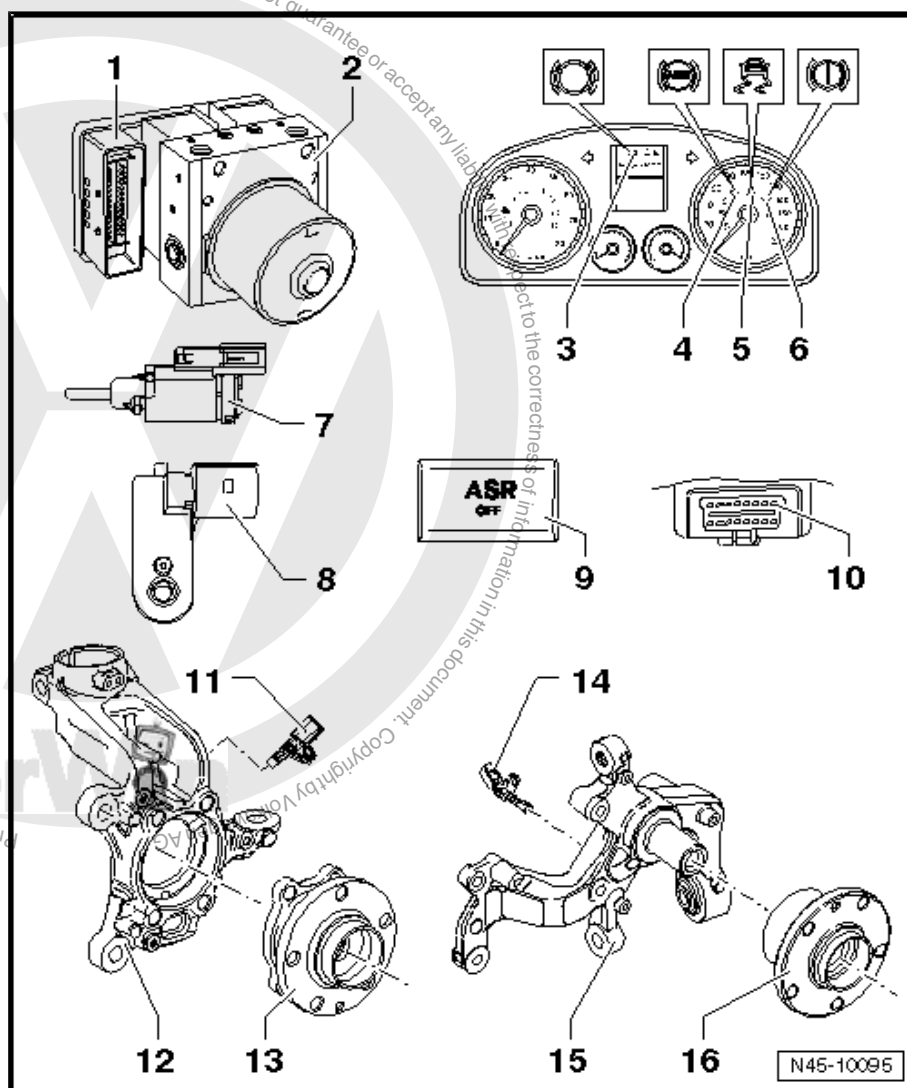
- ☐ Location: in dash panel insert
- ☐ Function: ⇒ [page 20](#) .

#### 5 - Traction control system warning lamp -K86-

- ☐ Location: in dash panel insert
- ☐ Function: ⇒ [page 20](#) .

#### 6 - Brake system warning lamp -K118-

- ☐ Location: in dash panel insert
- ☐ Function: ⇒ [page 20](#) .





**7 - Brake light switch -F- up to week 50/2005**

- ☐ Including brake pedal switch -F47- .
- ☐ Location: on brake pedal.
- ☐ Removing, installing and adjusting ⇒ [page 111](#) .

**8 - Brake light switch -F- from week 50/2005**

- ☐ Including brake pedal switch -F47- .
- ☐ Location: on brake master cylinder.
- ☐ Removing and installing ⇒ [page 139](#) .

**9 - TCS and ESP button -E256-**

- ☐ Location: in centre console.

**10 - Diagnostic connection**

- ☐ Location: driver side footwell cover.

**11 - Front right speed sensor -G45- / front left speed sensor -G47-**

- ☐ Can be tested in "Guided fault finding" using -VAS 5051-
- ☐ Removing and installing ⇒ [page 53](#) .

**12 - Wheel bearing housing**

**13 - Wheel bearing/hub unit**

- ☐ ABS sensor ring is installed in wheel bearing.

**14 - Rear right speed sensor -G44- / rear left speed sensor -G46-**

- ☐ Can be tested in "Guided fault finding" using -VAS 5051-
- ☐ Removing and installing ⇒ [page 54](#) .

**15 - Rear axle assembly with stub axle**

**16 - Wheel hub with wheel bearing**

- ☐ ABS sensor ring is installed in wheel bearing.





## 4.2 ABS Mark 60 (ABS/EDL/TCS/ESP) up to week 27/2008

### 1 - ABS control unit -J104-

- ❑ Location: on the hydraulic unit on right in engine compartment.
- ❑ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before separating connector.
- ❑ Removing and installing ➔ [page 38](#) .

### 2 - ABS hydraulic unit -N55-

- ❑ Location: on right in engine compartment.

The hydraulic unit consists of the components:

- ❑ ABS hydraulic pump - V64-
- ❑ Brake pressure sender - G201-
- ❑ Valve block (includes inlet/outlet valves)
- ❑ ABS hydraulic pump - V64- and valve block must not be separated from one another.
- ❑ Removing and installing ➔ [page 38](#) .

### 3 - Brake pad warning lamp - K32-

- ❑ Location: in dash panel insert
- ❑ Function: ➔ [page 20](#) .

### 4 - ABS warning lamp -K47-

- ❑ Location: in dash panel insert
- ❑ Function: ➔ [page 20](#) .

### 5 - ESP and TCS warning lamp -K155-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Location: in dash panel insert
- ❑ Function: ➔ [page 20](#) .

### 6 - Brake system warning lamp -K118-

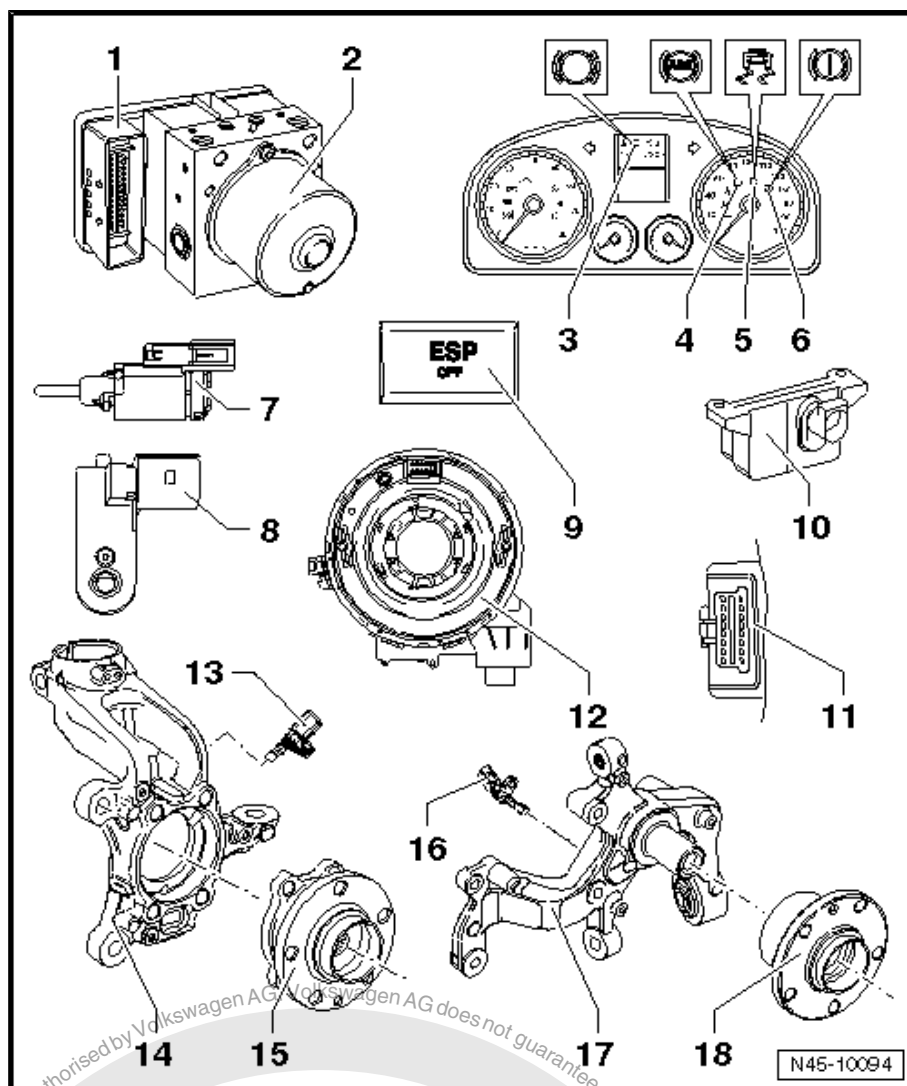
- ❑ Location: in dash panel insert
- ❑ Function: ➔ [page 20](#) .

### 7 - Brake light switch -F- up to week 50/2005

- ❑ Including brake pedal switch -F47- .
- ❑ Location: on brake pedal.
- ❑ Removing and installing ➔ [page 111](#) .

### 8 - Brake light switch -F- from week 50/2005

- ❑ Including brake pedal switch -F47- .
- ❑ Location: on brake master cylinder.





- ☐ Removing and installing ⇒ [page 139](#) .

#### 9 - TCS and ESP button -E256-

- ☐ Only vehicles with ABS/EDL/TCS/ESP.
- ☐ Location: in centre console.

#### 10 - ESP sensor unit -G419-

- ☐ Only vehicles with ABS/EDL/TCS/ESP.
- ☐ Location: under right front seat
- ☐ Combined lateral acceleration sender -G200-, yaw rate sender -G202- and longitudinal acceleration sender -G251-
- ☐ Combined in one housing.
- ☐ Removing and installing ⇒ [page 57](#) .

#### 11 - Diagnostic connection

- ☐ Location: driver side footwell cover.

#### 12 - Steering angle sender -G85-

- ☐ Location: on steering column between steering wheel and steering column switch.
- ☐ Removing and installing ⇒ [page 58](#) .

#### 13 - Front right/left speed sensor -G45- / -G47-

- ☐ Removing and installing ⇒ [page 53](#) .

#### 14 - Wheel bearing housing

#### 15 - Wheel bearing/hub unit

- ☐ ABS sensor ring is installed in wheel bearing.

#### 16 - Rear right/left speed sensor -G44- / -G46-

Figure for front-wheel drive

- ☐ Removing and installing (front-wheel drive) ⇒ [page 54](#)
- ☐ Removing and installing (four-wheel drive) ⇒ [page 55](#)

#### 17 - Wheel bearing housing

Figure for front-wheel drive

#### 18 - Wheel bearing/hub unit

Figure for front-wheel drive

- ☐ ABS sensor ring is installed in wheel bearing.



## 4.3 ABS Mark 60 (ABS/EDL/TCS/ESP) from week 27/2008

### 1 - ABS control unit -J104-

- ❑ Location: on the hydraulic unit on right in engine compartment.
- ❑ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before separating connector.

The following components are integrated into the control unit:

- ◆ Lateral acceleration sender -G200-
- ◆ Yaw rate sender -G202-
- ◆ Longitudinal acceleration sender -G251- (in vehicles with four-wheel drive and hill hold assist)
  - ❑ Removing and installing ⇒ [page 46](#) .

### 2 - ABS hydraulic unit -N55-

- ❑ Location: on right in engine compartment.

The hydraulic unit consists of the components:

- ❑ ABS hydraulic pump - V64-
- ❑ Brake pressure sender - G201-
- ❑ Valve block (includes inlet/outlet valves)
- ❑ ABS hydraulic pump - V64- and valve block must not be separated from one another.
- ❑ Removing and installing ⇒ [page 46](#) .

### 3 - Brake pad warning lamp -K32-

- ❑ Location: in dash panel insert
- ❑ Function: ⇒ [page 20](#) .

### 4 - ABS warning lamp -K47-

- ❑ Location: in dash panel insert
- ❑ Function: ⇒ [page 20](#) .

### 5 - ESP and TCS warning lamp -K155-

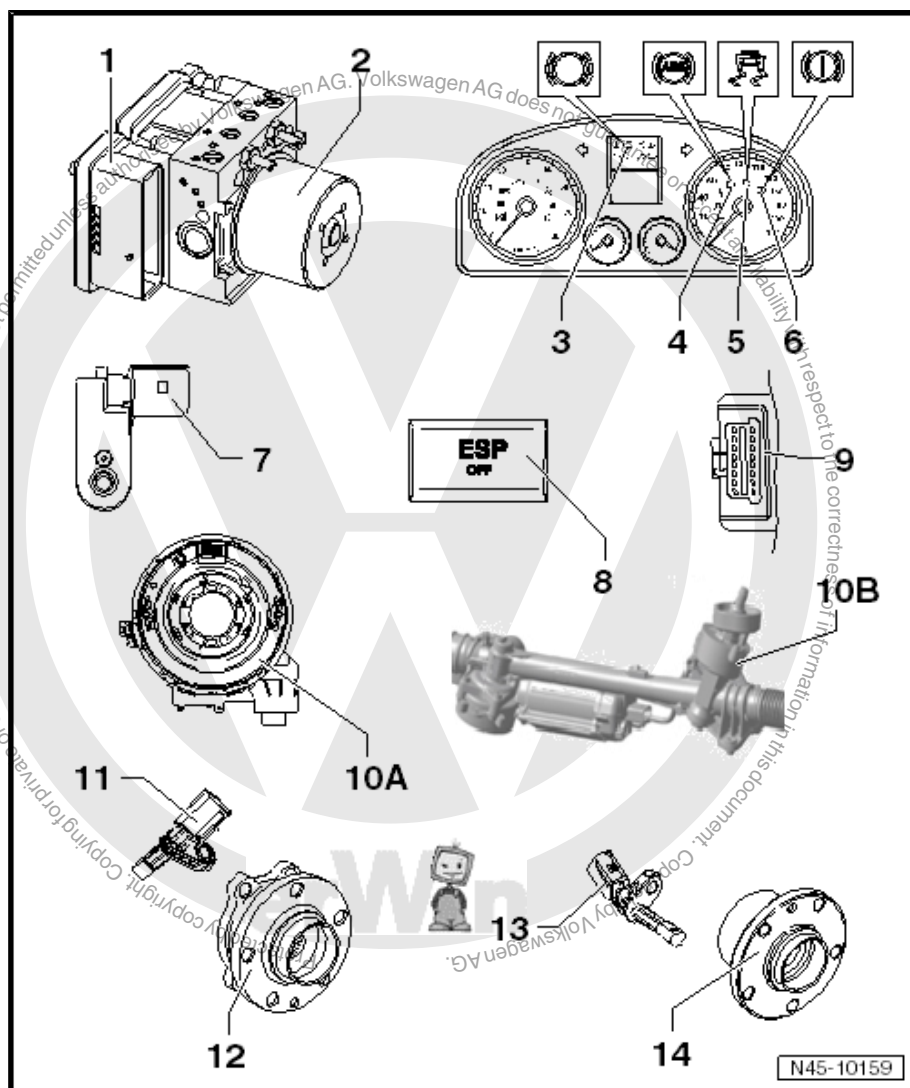
- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Location: in dash panel insert
- ❑ Function: ⇒ [page 20](#) .

### 6 - Brake system warning lamp -K118-

- ❑ Location: in dash panel insert
- ❑ Function: ⇒ [page 20](#) .

### 7 - Brake light switch -F-

- ❑ Including brake pedal switch -F47- .





- ☐ Location: on brake master cylinder.
- ☐ Removing and installing ⇒ [page 139](#) .

#### 8 - TCS and ESP button -E256-

- ☐ Only vehicles with ABS/EDL/TCS/ESP.
- ☐ Location: in centre console.

#### 9 - Diagnostic connection

- ☐ Location: driver side footwell cover.

#### 10 - Steering angle sender -G85-



##### Note

- ☐ Location A: on steering column between steering wheel and steering column switch.
- ☐ Removing and installing ⇒ [page 58](#) .
- ☐ Location B: in steering box.

#### 11 - Front right/left speed sensor -G45- / -G47-

- ☐ Removing and installing ⇒ [page 53](#) .

#### 12 - Wheel bearing/hub unit

- ☐ ABS sensor ring is installed in wheel bearing.

#### 13 - Rear right/left speed sensor -G44- / -G46-

Figure for front-wheel drive

- ☐ Removing and installing (front-wheel drive) ⇒ [page 54](#)
- ☐ Removing and installing (four-wheel drive) ⇒ [page 55](#)

#### 14 - Wheel bearing/hub unit

Figure for front-wheel drive

- ☐ ABS sensor ring is installed in wheel bearing.

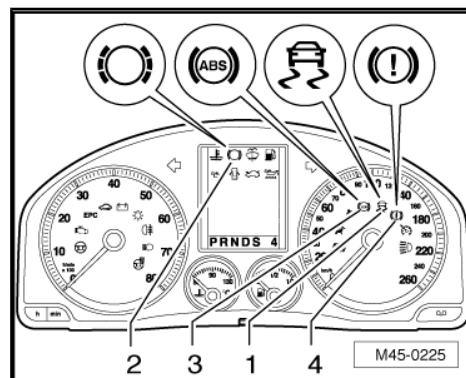


## 5 Fault display via warning lamps

### 5.1 ABS/TCS

#### Warning lamps

Item	Description
1	Traction control system warning lamp -K86-
2	Brake pad warning lamp -K32-
3	ABS warning lamp -K47-
4	Brake system warning lamp -K118-





## Warning lamps in vehicles for the USA

Item	Description
1	Traction control system warning lamp -K86-
2	Brake pad warning lamp -K32-
3	ABS warning lamp -K47-
4	Brake system warning lamp -K118-

### Brake pad warning lamp -K32-

- ◆ If the brake pad warning lamp -K32- -2- does not go out 3 seconds after the ignition is switched on, or it comes on during vehicle operation, the fault may be:

-a- The brake pads are worn.

Check brake pads/linings on front and rear axles. Renew worn brake pads/linings.

-b- there is a wire fault. ➔ Current flow diagrams, Electrical fault finding and Fitting locations

### ABS warning lamp -K47-

- ◆ If the ABS warning lamp -K47- -3- does not go out after the ignition has been switched on and test sequence has been completed, then the fault may be:

-a- The voltage supply is below 10 volts.

-b- There is a fault in the ABS.



### WARNING

*In the event of an ABS fault -b-, the anti-lock brake system remains switched off, but the brake system remains fully operational.*

-c- A temporary speed sensor fault occurred since the vehicle was last started.

In this case, the ABS warning lamp will go out automatically after the engine is restarted and the vehicle speed exceeds 20 km/h.

-d- The connection from dash panel insert to ABS control unit with EDL -J104- is interrupted ➔ Current flow diagrams, Electrical fault finding and Fitting locations

-e- The dash panel insert is defective.

### ABS warning lamp -K47- and brake system warning lamp -K118-

- ◆ If the ABS warning lamp -K47- -3- goes out but the brake system warning lamp -K118- -4- remains on, then the fault may be:

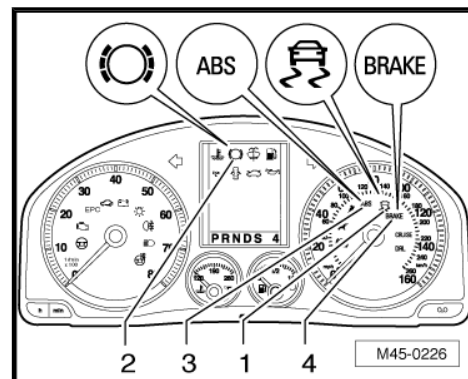
-a- The handbrake is applied.

-b- The brake fluid level is too low (the warning lamp flashes).

Three warning tones are audible after ignition is switched on.

-c- There is a fault in the wiring to brake system warning lamp -K118- ➔ Current flow diagrams, Electrical fault finding and Fitting locations.

- ◆ If the ABS warning lamp -K47- -3- and the brake system warning lamp -K118- -4- light up, then the ABS is defective. A change in braking behaviour is to be reckoned with.





## WARNING

**After the ABS warning lamp -K47- and the brake system warning lamp -K118- have lit up, it is possible that the rear wheels will lock up earlier.**

### Traction control system warning lamp -K86-

- ◆ If the traction control system warning lamp -K86- -1- does not go out after switching ignition on and completion of test sequence then the fault may be:

There is a fault present which only affects the TCS. The ABS and EBD safety systems on the vehicle remain fully functional ⇒ Vehicle diagnosis, testing and information system VAS 5051 Interrogate fault memory.

- a- Short-circuit to positive in TCS and ESP button -E256- .
- b- There is a fault in the activation of the traction control system warning lamp -K86- → Current flow diagrams, Electrical fault finding and Fitting locations.
- c- The TSC system was shut off by the TCS button -E256- .

**If traction control system warning lamp -K86- flashes while the vehicle is in motion, the TCS is in operation.**

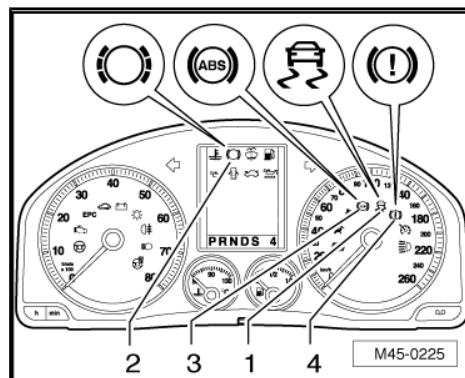
- ◆ If the TCS warning lamp -K86- -1- does not light up during the self-test, the fault may be:

-a- The TCS warning lamp -K86- is defective ⇒ Vehicle diagnosis, testing and information system VAS 5051 Perform electrical check.

## 5.2 ABS/EDL/TCS/ESP

### Warning lamps

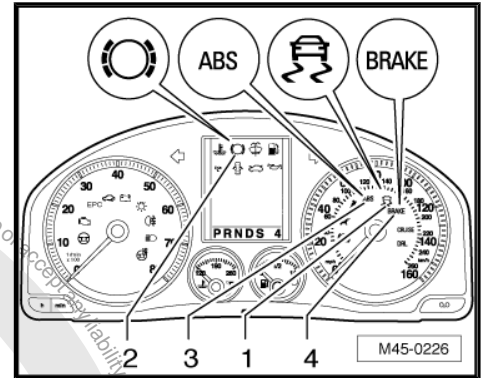
Item	Description
1	ESP warning lamp -K155-
2	Brake pad warning lamp -K32-
3	ABS warning lamp -K47-
4	Brake system warning lamp -K118-





## Warning lamps in vehicles for the USA

Item	Description
1	ESP warning lamp -K155-
2	Brake pad warning lamp -K32-
3	ABS warning lamp -K47-
4	Brake system warning lamp -K118-



### Brake pad warning lamp -K32-

- ◆ If the brake pad warning lamp -K32- -2- does not go out 3 seconds after the ignition is switched on, or it comes on during vehicle operation, the fault may be:

-a- The brake pads are worn.

Check brake pads/linings on front and rear axles. Renew worn brake pads/linings.

-b- There is a fault in the line ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

### ABS warning lamp -K47-

- ◆ If the ABS warning lamp -K47- -3- does not go out after the ignition has been switched on and test sequence has been completed, then the fault may be:

-a- The voltage supply is below 10 volts.

-b- There is a fault in the ABS.



### WARNING

*In the event of an ABS fault -b-, the anti-lock brake system remains switched off, but the brake system remains fully operational.*

-c- A temporary speed sensor fault occurred since the vehicle was last started.

In this case, the ABS warning lamp will go out automatically after the engine is restarted and the vehicle speed exceeds 20 km/h.

-d- The connection from dash panel insert to ABS with EDL control unit -J104- is interrupted ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

-e- The dash panel insert is defective.

### ABS warning lamp -K47- and brake system warning lamp -K118-

- ◆ If the ABS warning lamp -K47- -3- goes out but the brake system warning lamp -K118- -4- remains on, then the fault may be:

-a- The handbrake is applied.

-b- The brake fluid level is too low (the warning lamp flashes).

Three warning tones are audible after ignition is switched on.

-c- There is a fault in the wiring to brake system warning lamp -K118- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- ◆ If the ABS warning lamp -K47- -3- and the brake system warning lamp -K118- -4- light up, then the ABS is defective. A change in braking behaviour is to be reckoned with.



#### WARNING

***After the ABS warning lamp -K47- and the brake system warning lamp -K118- have lit up, it is possible that the rear wheels will lock up earlier.***

#### ESP warning lamp -K155-

- ◆ If the stabilisation program warning lamp -K155- -1- does not go out after switching ignition on and completion of test sequence then the fault may be:

A fault in the system affecting only the TCS/ESP. The ABS/EDL and EBD safety systems on the vehicle remain fully functional  
⇒ Vehicle diagnosis, testing and information system VAS 5051 Interrogate fault memory.

-a- Short-circuit to positive in TCS and ESP button -E256- .

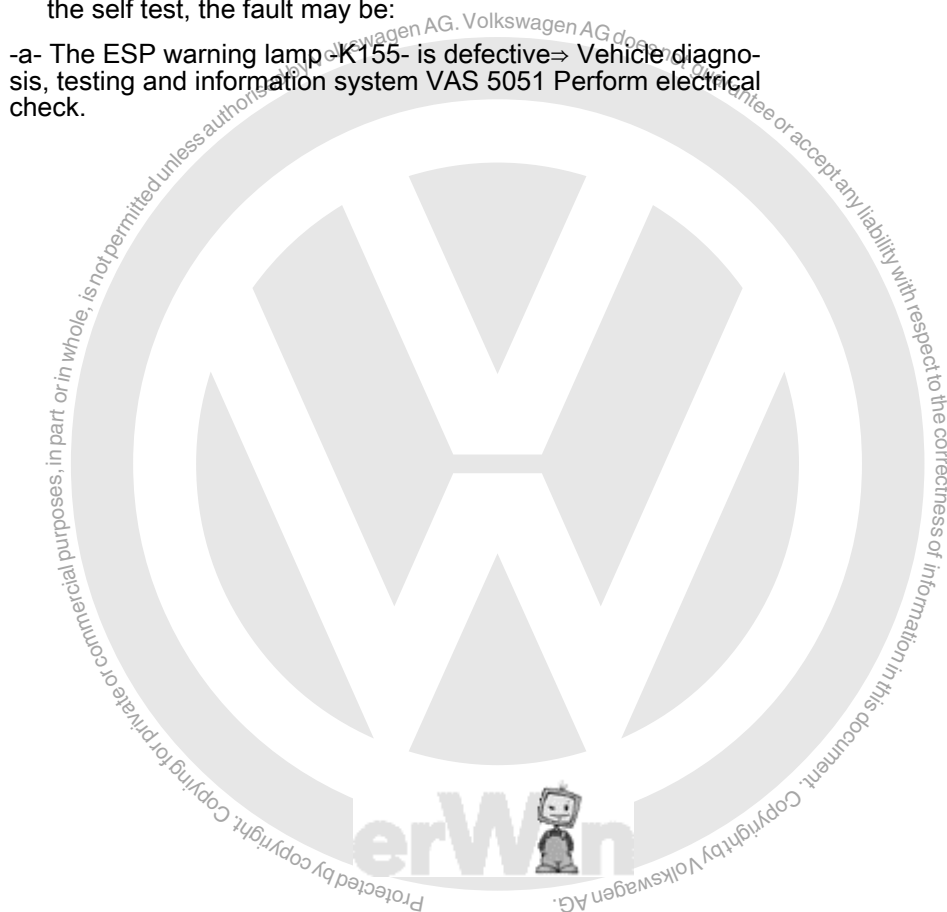
-b- There is a fault in the activation of the ESP and TCS warning lamp -K155- → Current flow diagrams, Electrical fault finding and Fitting locations.

-c- The TCS/ESP system was shut off by the TCS and ESP button -E256- .

**If the ESP warning lamp -K155- flashes while the vehicle is in motion, the TCS or ESP is in operation.**

- ◆ If the ESP warning lamp -K155- -1- does not light up during the self test, the fault may be:

-a- The ESP warning lamp -K155- is defective ⇒ Vehicle diagnosis, testing and information system VAS 5051 Perform electrical check.





## 6 ABS Mark 70 (ABS/TCS)

### 1 - ABS control unit -J104-

- ☐ Removing and installing  
⇒ [page 29](#) .

### 2 - ABS hydraulic unit -N55-

- ☐ Removing and installing  
⇒ [page 29](#) .

### 3 - Brake line

- ☐ 14 Nm
- ☐ From primary piston circuit of brake master cylinder to hydraulic unit
- ☐ Identification: union nut with thread M10 x 1 or M12 x 1



#### WARNING

*During production the thread was changed from M10 x 1 to M12 x 1.*

### 4 - Brake line

- ☐ 14 Nm
- ☐ From secondary piston circuit of brake master cylinder to hydraulic unit
- ☐ Identification: union nut with thread M12 x 1

### 5 - Brake line

- ☐ 14 Nm
- ☐ To front left brake caliper
- ☐ Identification: union nut with thread M12 x 1 or M10 x 1



#### WARNING

*During production the thread was changed from M12 x 1 to M10 x 1.*

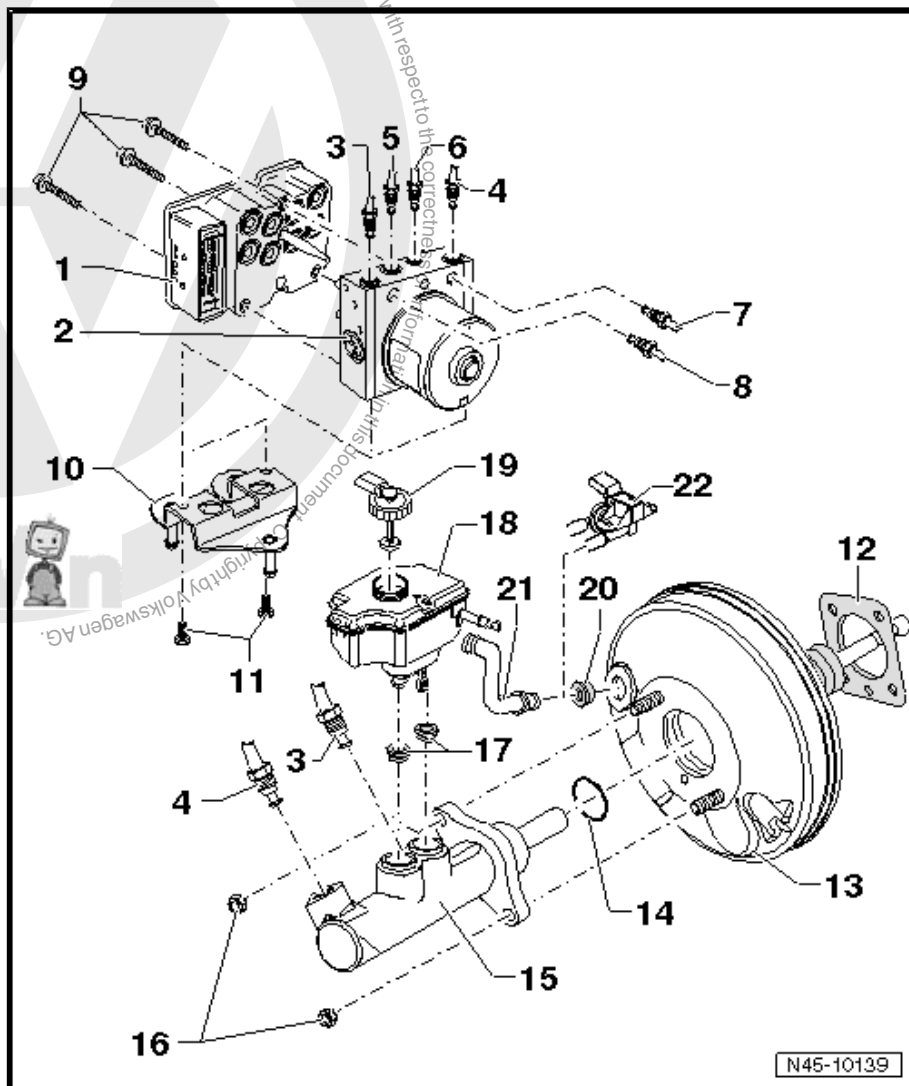
### 6 - Brake line

- ☐ 14 Nm
- ☐ To front right brake caliper
- ☐ Identification: union nut with thread M10 x 1 or M12 x 1



#### WARNING

*During production the thread was changed from M10 x 1 to M12 x 1.*





#### 7 - Brake line

- ☐ 14 Nm
- ☐ To rear left brake caliper
- ☐ Identification: union nut with thread M12 x 1

#### 8 - Brake line

- ☐ 14 Nm
- ☐ To rear right brake caliper
- ☐ Identification: union nut with thread M10 x 1

#### 9 - Torx bolt

- ☐ 5.5 Nm
- ☐ Use new bolts.

#### 10 - Bracket

#### 11 - Hexagon bolt

- ☐ 8 Nm

#### 12 - Seal

- ☐ For brake servo.

#### 13 - Brake servo

- ☐ On petrol engines, the required vacuum is taken from the intake manifold.
- ☐ Diesel engines are fitted with an vacuum pump to create the required vacuum ⇒ [page 137](#) .
- ☐ Functional check:
  - Depress brake pedal forcefully several times with engine switched off. Vacuum in unit is dissipated as a result.
  - Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.
- ☐ If faulty, renew as a complete unit.
- ☐ Removing and installing ⇒ [page 144](#) .

#### 14 - Sealing ring

#### 15 - Tandem brake master cylinder

- ☐ Cannot be repaired. If faulty, renew as a complete unit.
- ☐ Removing and installing ⇒ [page 141](#) .

#### 16 - Hexagon nut

- ☐ 25 Nm
- ☐ Always renew after removing.

#### 17 - Sealing plug

- ☐ Moisten with brake fluid and press into brake fluid reservoir.

#### 18 - Brake fluid reservoir

#### 19 - Cap

#### 20 - Sealing plug

- ☐ Connection for vacuum hose

#### 21 - Vacuum hose

- ☐ Fit in brake servo

#### 22 - Brake servo pressure sensor -G294-

- ☐ In vehicles with an FSI engine without HBV (hydraulic brake with vacuum servo)
- ☐ Removing and installing ⇒ [page 138](#) .



## 6.1 Connecting brake lines from tandem brake master cylinder to hydraulic unit, left-hand drive vehicle

### On tandem brake master cylinder:

A - Primary piston circuit of brake master cylinder to hydraulic unit.

- Identification: union nut with thread M10 x 1

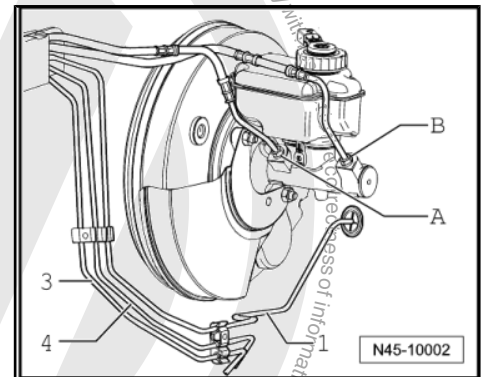
B - Secondary piston circuit of brake master cylinder to hydraulic unit.

- Identification: union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

3 - From hydraulic unit to rear right brake caliper.

4 - From hydraulic unit to rear left brake caliper.



### On hydraulic unit:

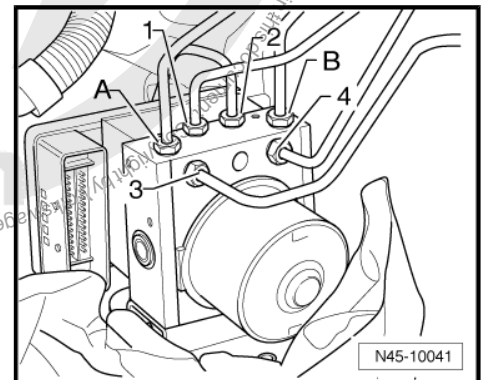
A - From hydraulic unit to primary piston circuit of brake master cylinder.

- Identification: union nut with thread M10 x 1 or M12 x 1.



#### WARNING

*During production the thread was changed from M10 x 1 to M12 x 1.*



B - From hydraulic unit to secondary piston circuit of brake master cylinder.

- Identification: union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

- Identification: union nut with thread M12 x 1 or M10 x 1



#### WARNING

*During production the thread was changed from M12 x 1 to M10 x 1.*

2 - From hydraulic unit to front right brake caliper.

- Identification: union nut with thread M10 x 1 or M12 x 1



#### WARNING

*During production the thread was changed from M10 x 1 to M12 x 1.*

3 - From hydraulic unit to rear right brake caliper.

- Identification: union nut with thread M10 x 1

4 - From hydraulic unit to rear left brake caliper.

- Identification: union nut with thread M12 x 1



## 6.2 Connecting brake lines from tandem brake master cylinder to hydraulic unit, right-hand drive vehicle

On tandem brake master cylinder:

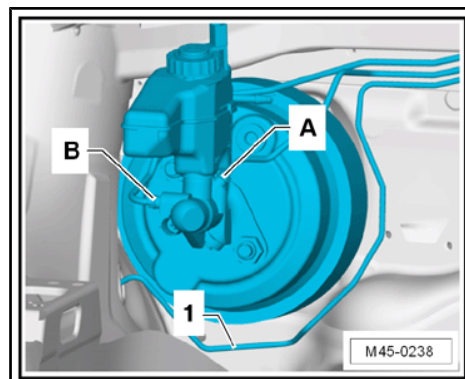
A - Primary piston circuit of brake master cylinder to hydraulic unit.

- Identification: union nut with thread M10 x 1

B - Secondary piston circuit of brake master cylinder to hydraulic unit.

- Identification: union nut with thread M12 x 1

1 - From hydraulic unit to front right brake caliper.



On hydraulic unit:

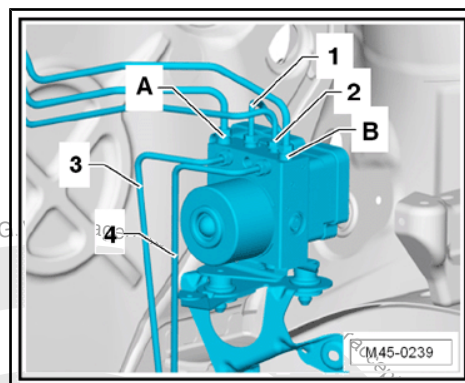
A - From hydraulic unit to primary piston circuit of brake master cylinder.

- Identification: union nut with thread M10 x 1 or M12 x 1.



### WARNING

*During production the thread was changed from M10 x 1 to M12 x 1.*



B - From hydraulic unit to secondary piston circuit of brake master cylinder.

- Identification: union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

- Identification: union nut with thread M12 x 1 or M10 x 1



### WARNING

*During production the thread was changed from M12 x 1 to M10 x 1.*

2 - From hydraulic unit to front right brake caliper.

- Identification: union nut with thread M10 x 1 or M12 x 1



### WARNING

*During production the thread was changed from M10 x 1 to M12 x 1.*

3 - From hydraulic unit to rear right brake caliper.

- Identification: union nut with thread M10 x 1

4 - From hydraulic unit to rear left brake caliper.



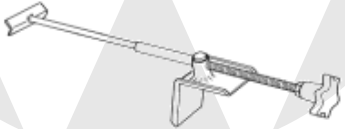
- Identification: union nut with thread M12 x 1



## 6.3 Removing control unit and hydraulic unit

### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1410-
- ◆ Brake pedal depressor - V.A.G 1869/2-

<p>V.A.G 1331</p> 	<p>V.A.G 1410</p> 
<p>V.A.G 1869/2</p> 	
	<p>W45-0003</p>



### Sealing plug -1H0 698 311 A-

The transport protection for the contact pins must always be placed on the hydraulic unit after the control unit has been disconnected from the hydraulic unit.

No warranty can be assumed for hydraulic units without transport protection.

1 - Transport protection for contact pins (foam)

2 - M10 sealing plugs

3 - M12 sealing plugs

### Removing

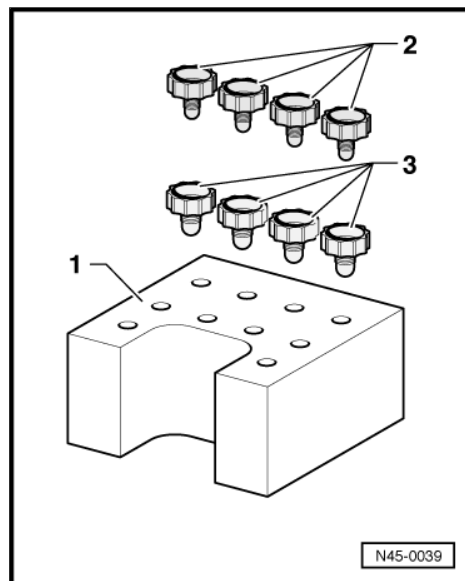
Location:

The control unit is bolted to the hydraulic unit and is located on right in the engine compartment.



### WARNING

***Do not bend the brake lines in the area of the hydraulic unit!***



- Read out and note the existing control unit code.
- Disconnect battery ⇒ Electrical system; Rep. Gr. 27 .
- Remove engine cover panel.

### 1.4 l TSI engine:

- Remove pressure pipe and intake connecting pipe with regulating flap control unit ⇒ 4-cylinder injection engine (1.4 l direct injection engine, turbocharger and compressor); Rep. Gr. 24 ; Injection system; Part I - assembly overview - intake manifold .
- Remove charge air hose ⇒ 4-cylinder injection engine (1.4 l direct injection engine, turbocharger and compressor); Rep. Gr. 21 ; Charge air system.
- Clamp off hose from coolant expansion tank and pull it off.

### 1.9 l diesel engine:

- Remove connecting hose to intake pipe ⇒ 4-cylinder diesel engine (2 valve); Rep. Gr. 21 Removing and installing charge air system with turbocharger
- Remove intake manifold flap motor -V157- ⇒ 4-cyl. diesel engine (2-valve); Rep. Gr. 23 ; Mixture preparation, injection .

### 2.0 l diesel engine:

- Remove connecting pipe between intake hose and turbo-charger.
- Remove toothed belt guard upper part.

Continuation for all models:



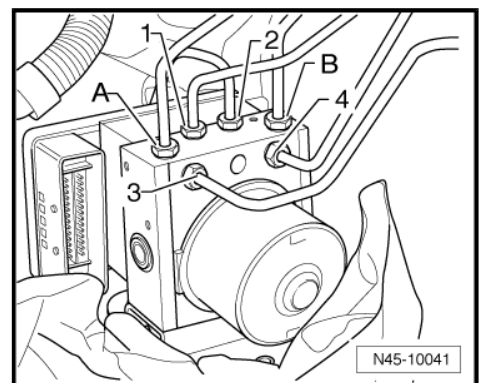
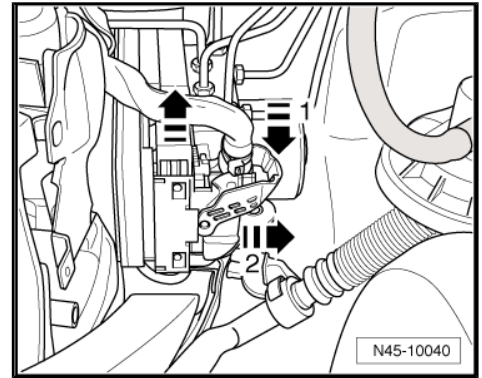
- Release connector on control unit -direction of arrow 1- and pull off in -direction of arrow 2-.
- Apply brake pedal depressor -V.A.G 1869/2- .
- Connect bleeder bottle hose to front left brake caliper bleeder valve and rear left brake caliper bleeder valve and open bleed-er valves.
- Depress brake pedal at least 60 mm using brake pedal de-pressor -V.A.G 1869/2- .
- Close front left and rear left bleeder valve.

Do not remove brake pedal depressor -V.A.G 1869/2- .

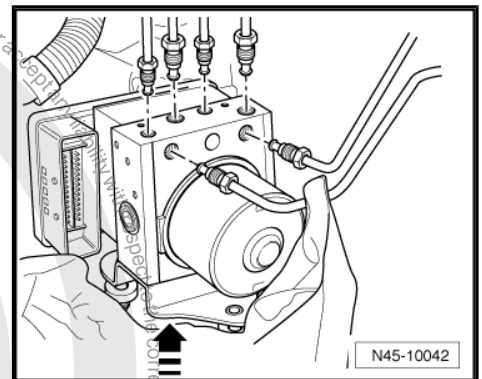
- Place sufficient lint-free cloths under the control unit and hy-draulic unit.

**Ensure no brake fluid gets onto contacts.**

- First identify the two brake master cylinder brake lines -A- and -B- and unscrew from the hydraulic unit.
- Immediately seal brake lines and threaded holes with sealing plugs -1H0 698 311 A- .
- Identify brake lines (brake calipers) -1- to -4-, unscrew and seal.

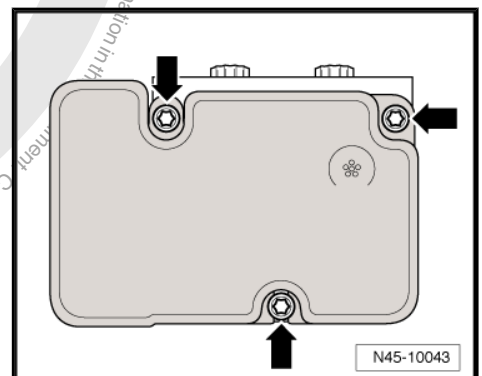


- Pull hydraulic unit with control unit in -direction of arrow- up-wards out of dampers.



## 6.4 Unbolting control unit from hydraulic unit

- Place hydraulic unit with control unit upwards on a clean flat level surface.
- Remove Torx bolts -arrows-.





- Without canting it, pull control unit off hydraulic unit in -direction of arrow-.
- Carefully pull all seals from hydraulic unit contact pins.

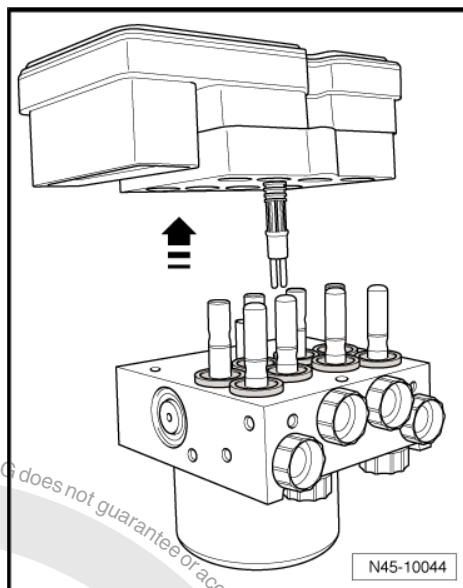


#### WARNING

- ◆ *Printed circuit board becomes visible when control unit is removed.*
- ◆ *No moisture or particles of dirt may enter control unit.*
- ◆ *Hydraulic pump must not be separated from hydraulic unit.*
- ◆ *Avoid electrostatic charge!*

- Cover control unit solenoids with a lint-free cloth.

After separating control unit and hydraulic unit, use transport protection for contact pins.



## 6.5 Installing new control unit



#### WARNING

*Severe shocks (e.g. dropping, impact) may destroy control unit. Control unit must not then be used.*

- Clean surfaces before assembling.
- Push all seals -A- over contact pins slightly.
- Without canting it, place control unit onto hydraulic unit.

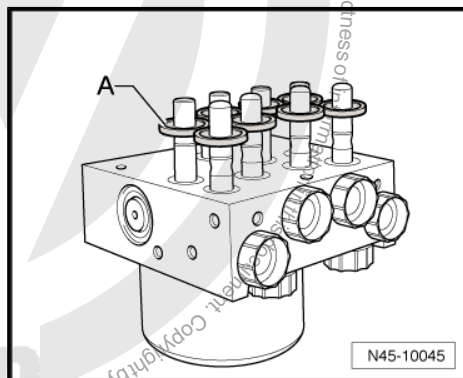
The seals are thus moved to end position.

- Bolt hydraulic unit and control unit with enclosed, new Torx bolts.



#### Note

- ◆ *It is not possible to fit a new control unit more than twice to an installed hydraulic unit to ensure that the flexible seal is free of leaks.*
- ◆ *A control unit which has already been operated in a vehicle must not be installed a second time.*



## 6.6 Installing control unit and hydraulic unit



#### Note

- ◆ *Remove sealing plugs from new hydraulic unit only when the corresponding brake line is going to be fitted.*
- ◆ *If sealing plugs are removed too early from the hydraulic unit, brake fluid can escape, and it can then no longer be guaranteed that the unit can be sufficiently filled and bled.*
- ◆ *When installing, ensure that rubber dampers are not pressed out of bracket.*



- Install in reverse order.
- Remove brake pedal depressor -V.A.G 1869/2- .
- Bleed brake system ➔ [page 131](#) .
- Connect battery ➔ Electrical system; Rep. Gr. 27 ; Battery;  
Disconnecting and reconnecting battery .
- Code ABS control unit -J104- with ➔ Vehicle diagnosis, testing  
and information system VAS 5051 in "Guided fault finding".

#### Specified torques

Component	Specified torque
Control unit to hydraulic unit ◆ Use new bolts!	5.5 Nm
Hexagon bolt of hydraulic unit to bracket	8 Nm
Brake lines to ABS assembly: Thread M10 x 1	14 Nm
Thread M12 x 1	14 Nm





## 7 ABS Mark 60 (ABS/EDL/TCS/ESP) up to week 27/2008

### 1 - ABS control unit -J104-

Separation of the control unit and hydraulic unit is not possible in vehicles with hydraulic brake servo or hill hold assist.

- ❑ Removing and installing  
⇒ [page 38](#) .

### 2 - ABS hydraulic unit -N55-

Separation of the control unit and hydraulic unit is not possible in vehicles with hydraulic brake servo or hill hold assist.

- ❑ Removing and installing  
⇒ [page 38](#) .

### 3 - Brake line

- ❑ 14 Nm
- ❑ From primary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification:  $\varnothing$  6.5 mm and union nut with long thread M 12 x 1.

### 4 - Brake line

- ❑ 14 Nm
- ❑ From secondary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification:  $\varnothing$  6.5 mm and union nut with long thread M 12 x 1.

### 5 - Brake line

- ❑ 14 Nm
- ❑ To front left brake caliper
- ❑ Identification:  $\varnothing$  5.25 mm and union nut with short thread M12 x 1.

### 6 - Brake line

- ❑ 14 Nm
- ❑ To front right brake caliper
- ❑ Identification:  $\varnothing$  5.25 mm and union nut with thread M10 x 1

### 7 - Brake line

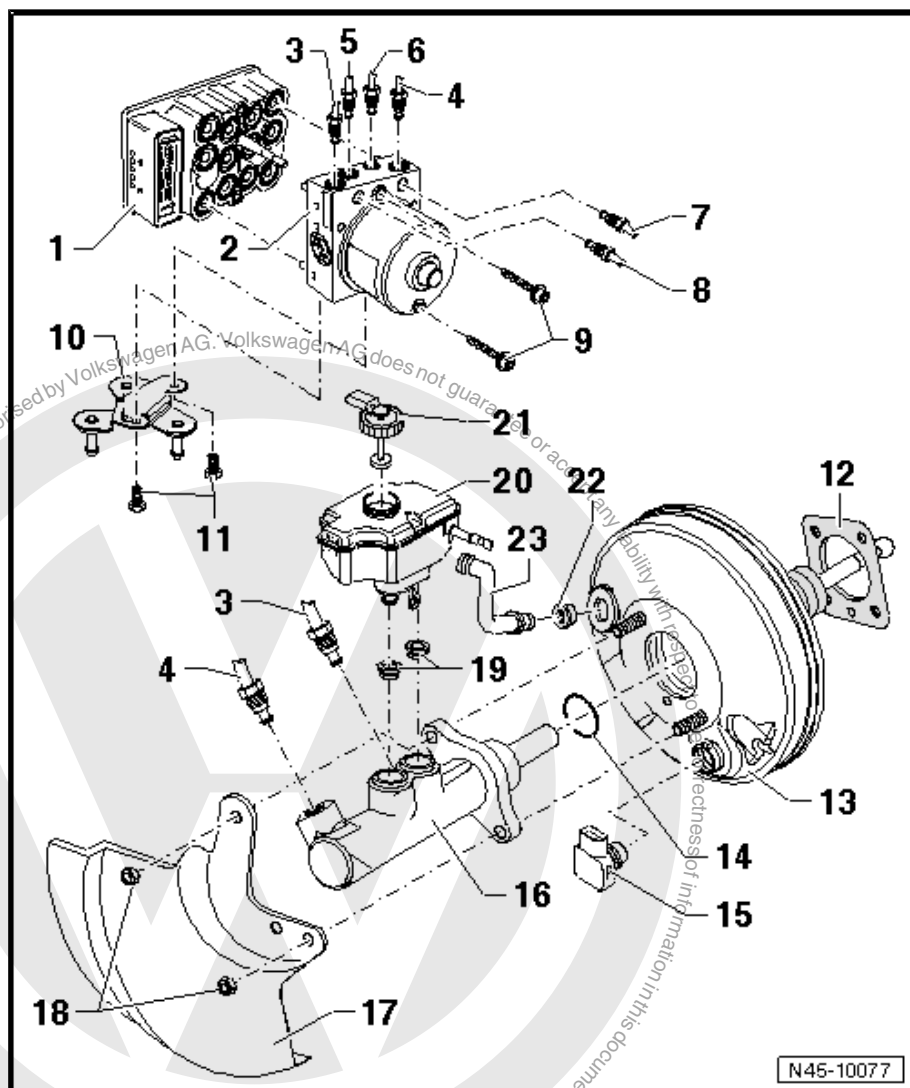
- ❑ 14 Nm
- ❑ To rear left brake caliper
- ❑ Identification:  $\varnothing$  5.25 mm and union nut with short thread M12 x 1.

### 8 - Brake line

- ❑ 14 Nm
- ❑ To rear right brake caliper
- ❑ Identification:  $\varnothing$  5.25 mm and union nut with thread M10 x 1

### 9 - Torx socket head bolt, 5.5 Nm

- ❑ Use new bolts.





#### 10 - Bracket

#### 11 - Hexagon bolt, 8 Nm

#### 12 - Seal

- ☐ For brake servo.

#### 13 - Brake servo

- ☐ On petrol engines, the required vacuum is taken from the intake manifold.
- ☐ Some vehicles with a petrol engine and an automatic gearbox are equipped with a brake vacuum pump  
⇒ [page 138](#) .
- ☐ A vacuum sender is fitted in vehicles with HBV ⇒ [page 58](#) .
- ☐ Diesel engines are fitted with a vacuum pump to create the required vacuum ⇒ [page 137](#) .
- ☐ Functional check:
  - With engine switched off, depress brake pedal firmly several times. (This will release the vacuum in the unit.)
  - Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.
- ☐ If faulty renew complete (check all vacuum lines first).
- ☐ Removing and installing ⇒ [page 144](#) .

#### 14 - Sealing ring

#### 15 - Brake servo vacuum sender -G483-

- ☐ Only on vehicles having HBV
- ☐ Removing and installing ⇒ [page 58](#) .

#### 16 - Brake master cylinder

- ☐ Allocation ⇒ Electronic Parts Catalogue (ETKA) .
- ☐ Cannot be repaired. If faulty, renew as a complete unit.
- ☐ Removing and installing ⇒ [page 141](#) .

#### 17 - Heat shield

#### 18 - Hexagon nut, 25 Nm

- ☐ Always renew after removing.

#### 19 - Sealing plug

- ☐ Moisten with brake fluid and press into brake fluid reservoir.

#### 20 - Brake fluid reservoir

#### 21 - Cap

#### 22 - Sealing plug

- ☐ Connection for vacuum hose

#### 23 - Vacuum hose

- ☐ Fit in brake servo



## 7.1 Connecting brake lines from brake master cylinder to hydraulic unit, left-hand drive vehicle

### On brake master cylinder:

A - Primary piston circuit of brake master cylinder to hydraulic unit.

- Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

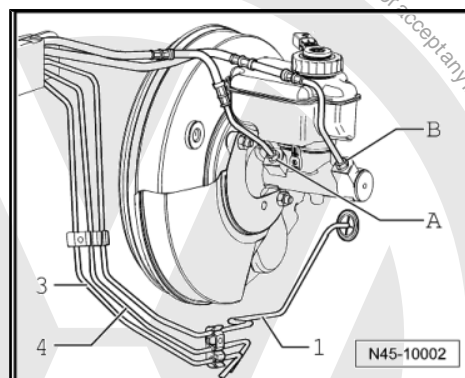
B - Secondary piston circuit of brake master cylinder to hydraulic unit.

- Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

3 - From hydraulic unit to rear right brake caliper.

4 - From hydraulic unit to rear left brake caliper.



### On hydraulic unit:

A - From hydraulic unit to primary piston circuit of brake master cylinder.

- Identification:  $\varnothing$  6.5 mm and union nut with long thread M 12 x 1.

B - From hydraulic unit to secondary piston circuit of brake master cylinder.

- Identification:  $\varnothing$  6.5 mm and union nut with long thread M 12 x 1.

1 - From hydraulic unit to front left brake caliper.

- Identification:  $\varnothing$  5.25 mm and union nut with short thread M12 x 1.

2 - From hydraulic unit to front right brake caliper.

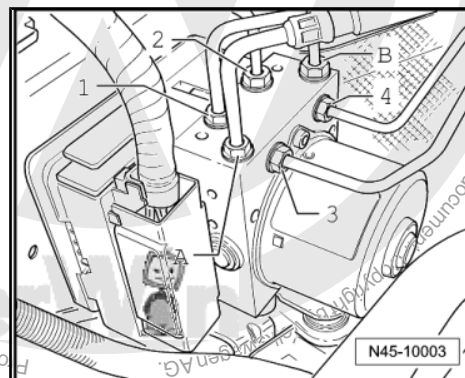
- Identification:  $\varnothing$  5.25 mm and union nut with thread M10 x 1

3 - From hydraulic unit to rear right brake caliper.

- Identification:  $\varnothing$  5.25 mm and union nut with thread M10 x 1

4 - From hydraulic unit to rear left brake caliper.

- Identification:  $\varnothing$  5.25 mm and union nut with short thread M12 x 1.



## 7.2 Connecting brake lines from tandem brake master cylinder to hydraulic unit, right-hand drive vehicle

### On tandem brake master cylinder:

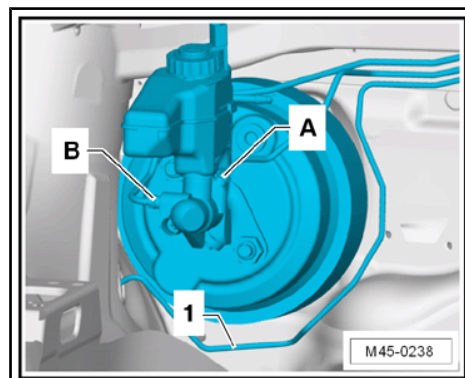
A - Primary piston circuit of brake master cylinder to hydraulic unit.

- Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

B - Secondary piston circuit of brake master cylinder to hydraulic unit.

- Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

1 - From hydraulic unit to front right brake caliper.





### On hydraulic unit:

A - From hydraulic unit to primary piston circuit of brake master cylinder.

- Identification: Ø 6.5 mm and union nut with long thread M 12 x 1.

B - From hydraulic unit to secondary piston circuit of brake master cylinder.

- Identification: Ø 6.5 mm and union nut with long thread M 12 x 1.

1 - From hydraulic unit to front left brake caliper.

- Identification: Ø 5.25 mm and union nut with short thread M12 x 1.

2 - From hydraulic unit to front right brake caliper.

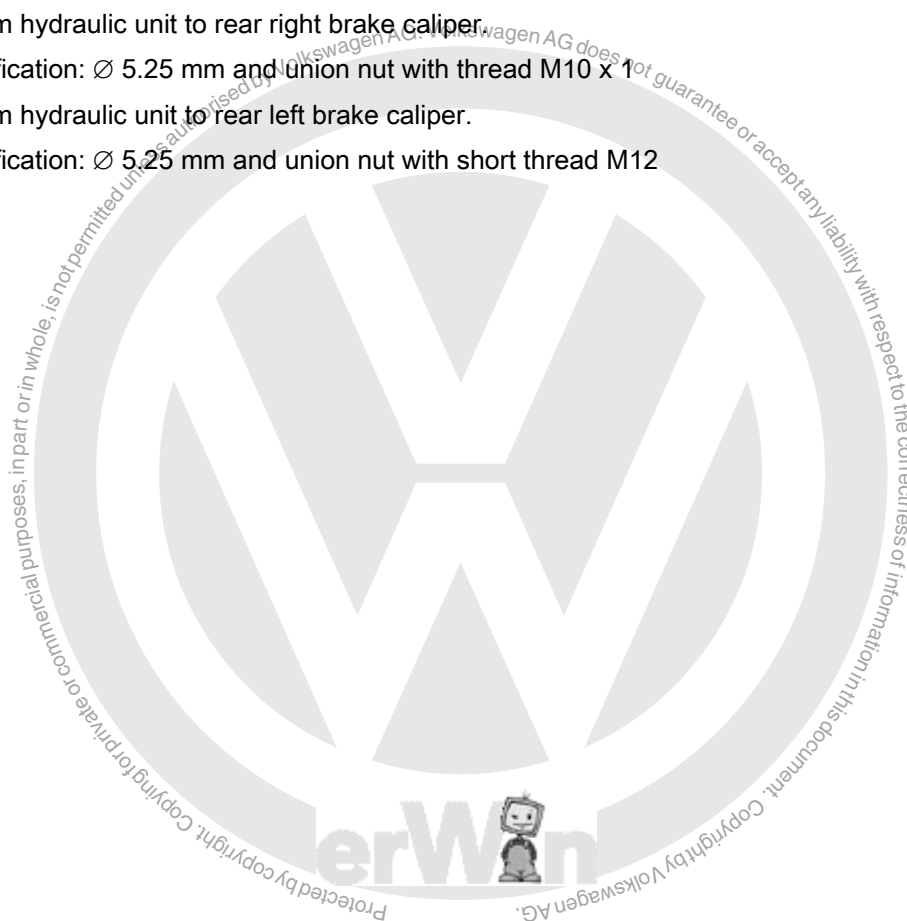
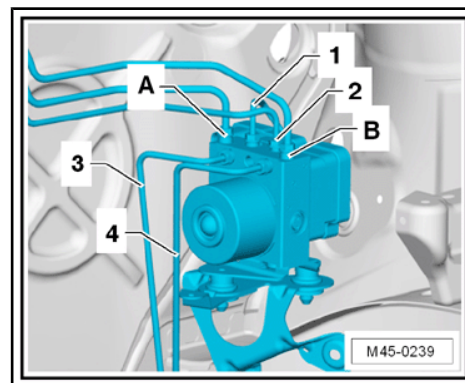
- Identification: Ø 5.25 mm and union nut with thread M10 x 1

3 - From hydraulic unit to rear right brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M10 x 1

4 - From hydraulic unit to rear left brake caliper.

- Identification: Ø 5.25 mm and union nut with short thread M12 x 1.








## 7.3 Removing control unit and hydraulic unit

### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1410-
- ◆ Brake pedal depressor - V.A.G 1869/2-

<p>V.A.G 1331</p> 	<p>V.A.G 1410</p> 
<p>V.A.G 1869/2</p> 	

W45-0003



### Sealing plug -1H0 698 311 A-

The transport protection for the contact pins must always be placed on the hydraulic unit after the control unit has been disconnected from the hydraulic unit.

No warranty can be assumed for hydraulic units without transport protection.

- 1 - Transport protection for contact pins (foam)
- 2 - Sealing plug M10
- 3 - Sealing plug M12

### Removing

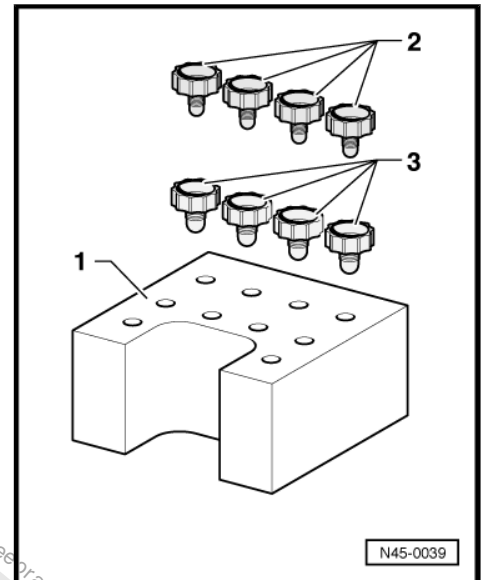
Location:

The control unit is bolted to the hydraulic unit and is located on right in the engine compartment.



### WARNING

***Do not bend the brake lines in the area of the hydraulic unit!***



- Read out and note the existing control unit code.
- Disconnect battery ➔ Electrical system; Rep. Gr. 27 .
- Remove engine cover panel.

### 1.4 I TSI engine:

- Remove pressure pipe and intake connecting pipe with regulating flap control unit ➔ 4-cylinder injection engine (1.4 I direct injection engine, turbocharger and compressor); Rep. Gr. 24 ; Injection system; Part I - assembly overview - intake manifold .
- Remove charge air hose ➔ 4-cylinder injection engine (1.4 I direct injection engine, turbocharger and compressor); Rep. Gr. 21 Charge air system .
- Clamp off hose from coolant expansion tank and pull it off.

### 1.9 I diesel engine:

- Remove connecting hose to intake pipe ➔ 4-cylinder diesel engine (2 valve); Rep. Gr. 21 ; Removing and installing charge air system with turbocharger .
- Remove intake manifold flap motor V157 ➔ 4-cylinder diesel engine (2 valve); Rep. Gr. 23 ; Removing and installing mixture preparation - injection .

### 2.0 I diesel engine:

- Remove connecting pipe between intake hose and turbocharger.
- Remove toothed belt guard upper part.

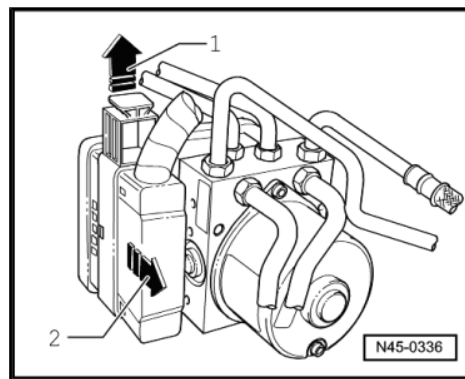
### Diesel engines with diesel particulate filter:

- Unscrew exhaust gas pressure sensor 1 -G450- , separate electrical connectors, unscrew and lower diesel particulate filter ➔ Rep. Gr. 26 ; Assembly overview - front exhaust pipe with particulate filter .

### Continuation for all vehicles

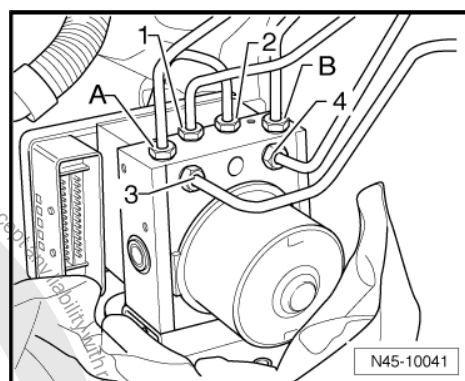


- Release connector on control unit in direction of arrow -1- and pull off -2-.
- Apply brake pedal depressor -V.A.G 1869/2- .
- Connect bleeder bottle hose to front left brake caliper bleeder valve and rear left brake caliper bleeder valve and open bleed-er valves.
- Depress brake pedal at least 60 mm using brake pedal de-pressor -V.A.G 1869/2- .
- Close front left and rear left bleeder valve.
- Do not remove brake pedal depressor -V.A.G 1869/2- .
- Place sufficient lint-free cloths under the control unit and hy-draulic unit.

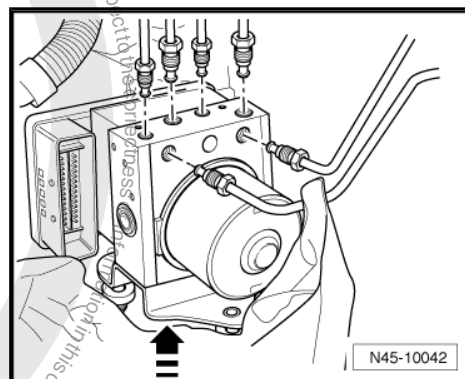


**Ensure no brake fluid gets onto contacts.**

- First identify the two brake master cylinder brake lines -A- and -B- and unscrew from the hydraulic unit.
- Immediately seal brake lines and threaded holes with sealing plugs -1H0 698 311 A- .
- Identify brake lines (brake calipers) -1- to -4-, unscrew and seal.



- Pull hydraulic unit with control unit in -direction of arrow- up-wards out of dampers.



## 7.4 Unbolting control unit from hydraulic unit



**Note**

*Separation of the control unit and hydraulic unit is not possible in vehicles with hydraulic brake servo or hill hold assist.*

- Place hydraulic unit with control unit downwards on a clean flat level surface.

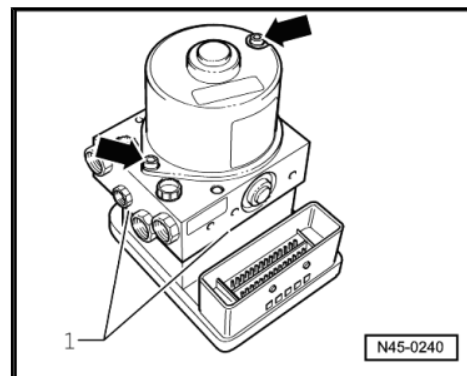


- Remove Torx bolts E5 -arrows- from hydraulic pump.

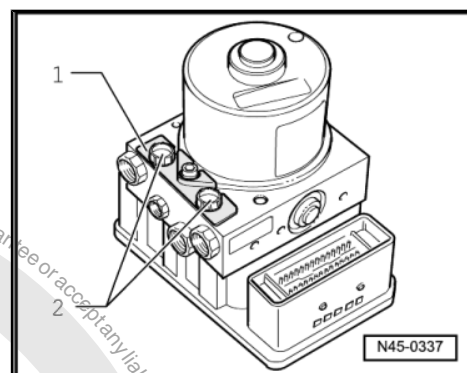


#### WARNING

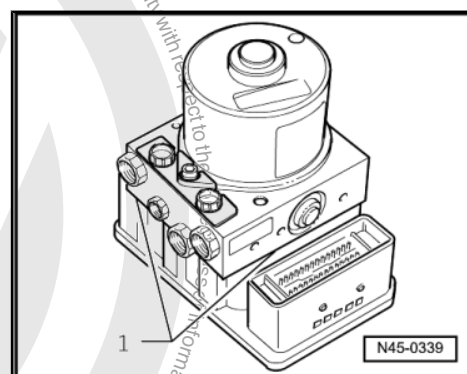
*Hydraulic pump must not be separated from hydraulic unit.  
Avoid electrostatic charge!*



- The hydraulic pump must therefore be secured onto the hydraulic unit with the red retainer -1- from the repair kit and two sealing plugs -2-.



- Carefully lift hydraulic unit with hydraulic pump at joint -1- upwards off control unit.

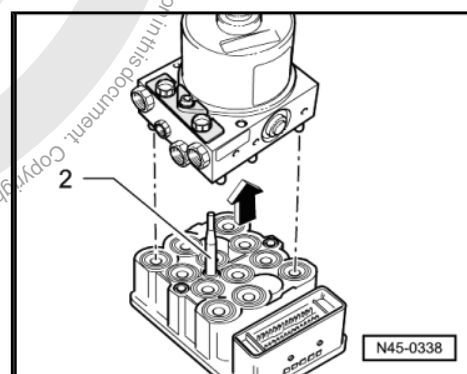


When pulling off the control unit, ensure that the hydraulic unit contact pins are not canted against the control unit solenoids.

Item 2 adapter for pump motor.

- Cover control unit solenoids with a lint-free cloth.

After separating control unit and hydraulic unit, use transport protection for contact pins.



## 7.5 Installing new control unit



#### WARNING

*Severe shocks (e.g. dropping, impact) may destroy control unit. Control unit must not then be used.*



- ◆ Before the new control unit can be installed, the pump motor adapter must be inserted to stop and must engage. Make sure not to damage the adapter guide.
- ◆ The adapter supplied as a spare part for the control unit can only be engaged once and then cannot be removed.
- ◆ The white paste on the bottom of the control unit serves as sealant and must not be removed.
- ◆ Make sure not to touch any contact surfaces on the adapter, pressure sensor and control unit as well as the silicone gel and the sealing components by hand or with objects to prevent them from being dirty or damaged.
- Press adapter into adapter guide to stop; it must then be engaged.
- Without canting it, place control unit onto hydraulic unit.
- Bolt hydraulic unit and control unit with the new Torx bolts which are enclosed.



#### Note

- ◆ *A new control unit may be mounted on an existing hydraulic unit max. twice to guarantee impermeability of the elastic seal.*
- ◆ *A control unit which has already been operated in a vehicle must not be installed a second time.*

## 7.6 Installing control unit and hydraulic unit



#### Note

- ◆ *Remove sealing plugs from new hydraulic unit only when the corresponding brake line is going to be fitted.*
- ◆ *If sealing plugs are removed too early from the hydraulic unit, brake fluid can escape, and it can then no longer be guaranteed that the unit can be sufficiently filled and bled.*

- Install in reverse order.
- Remove brake pedal depressor -V.A.G 1869/2- .
- Bleed brake system ➔ [page 131](#) .
- Code control unit -J104- with ➔ Vehicle diagnosis, testing and information system VAS 5051 in "Guided fault finding".

To do this, basic setting of the steering angle sender -G85- , the lateral acceleration sender -G200- and the brake pressure sender -G201- must be carried out.

#### Specified torques

Component	Specified torque
Control unit to hydraulic unit ◆ Use new bolts!	5.5 Nm
Hexagon bolt of hydraulic unit to bracket	8 Nm
Brake lines to ABS assembly:	
Thread M10 x 1	14 Nm
Thread M12 x 1	14 Nm



## 8 ABS Mark 60 (ABS/EDL/TCS/ESP) from week 27/2008

### 1 - ABS control unit -J104-

- ☐ Removing and installing  
⇒ [page 46](#) .

### 2 - Torx bolt

- ☐ 2 Nm + 0.8 Nm
- ☐ Use new bolts.

### 3 - ABS hydraulic unit -N55-

- ☐ Removing and installing  
⇒ [page 46](#) .

### 4 - Brake line

- ☐ 14 Nm
- ☐ From primary piston circuit of brake master cylinder to hydraulic unit
- ☐ Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

### 5 - Brake line

- ☐ 14 Nm
- ☐ From secondary piston circuit of brake master cylinder to hydraulic unit
- ☐ Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

### 6 - Brake line

- ☐ 14 Nm
- ☐ To front left brake caliper
- ☐ Identification:  $\varnothing$  5.25 mm and union nut with thread M10 x 1

### 7 - Brake line

- ☐ 14 Nm
- ☐ To front right brake caliper
- ☐ Identification:  $\varnothing$  5.25 mm and union nut with thread M12 x 1

### 8 - Brake line

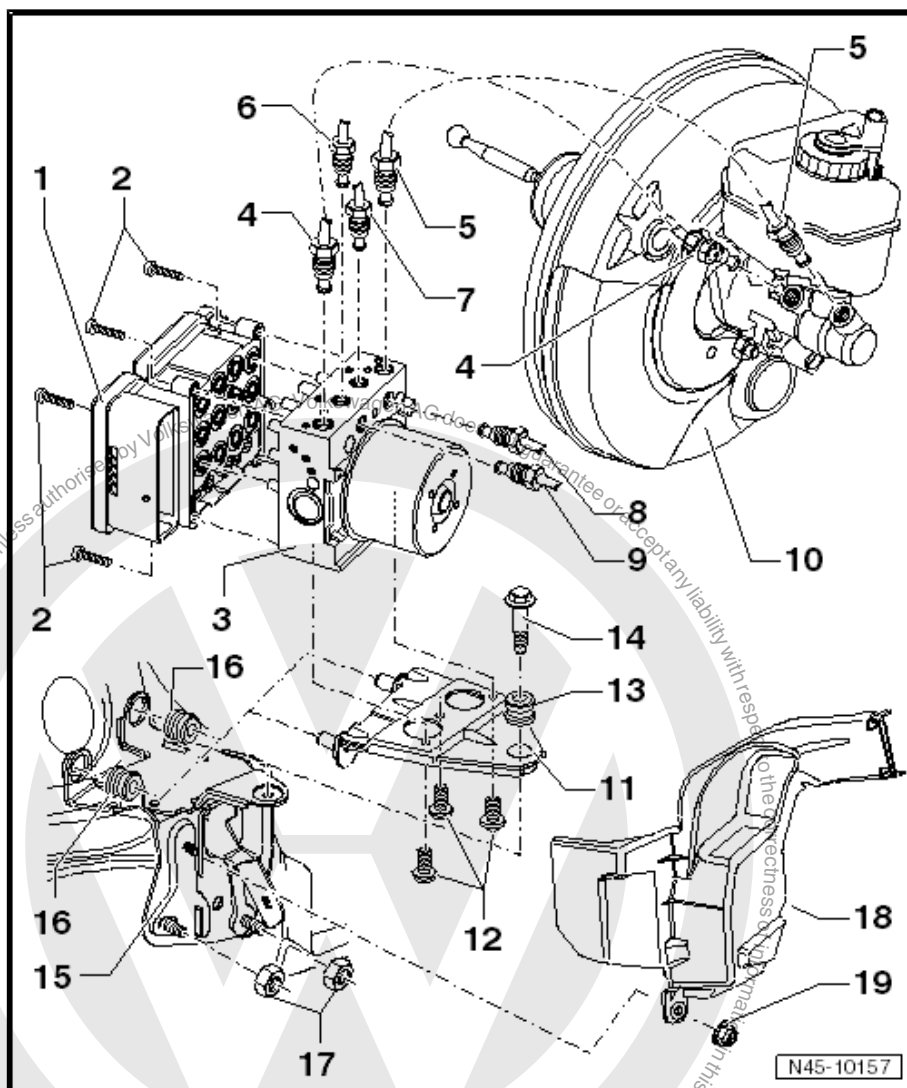
- ☐ 14 Nm
- ☐ To rear left brake caliper
- ☐ Identification:  $\varnothing$  5.25 mm and union nut with thread M12 x 1

### 9 - Brake line

- ☐ 14 Nm
- ☐ To rear right brake caliper
- ☐ Identification:  $\varnothing$  5.25 mm and union nut with thread M10 x 1

### 10 - Brake servo

- ☐ See ⇒ [page 134](#) .
- ☐ Removing and installing ⇒ [page 144](#) .





**11 - Bracket**

- ☐ Check for secure seating after installing.

**12 - Bolt**

- ☐ 8 Nm

**13 - Rubber damper**

**14 - Hexagon shoulder screw**

- ☐ 8 Nm

**15 - Bracket**

**16 - Rubber damper**

- ☐ Ensure that rubber dampers of retainer are not pressed out of bracket when installing.

**17 - Nut**

- ☐ 20 Nm

**18 - Heat shield**

**19 - Nut**

- ☐ 8 Nm

## 8.1 Connecting brake lines from brake master cylinder to hydraulic unit, left-hand drive vehicle

On brake master cylinder:

A - Primary piston circuit of brake master cylinder to hydraulic unit.

- Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

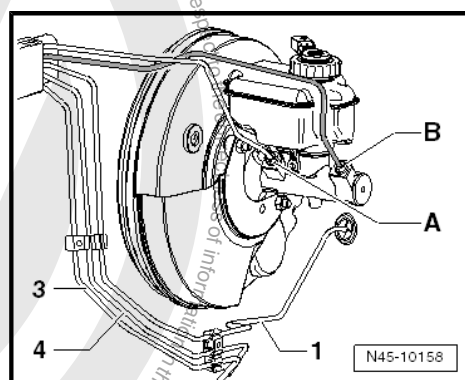
B - Secondary piston circuit of brake master cylinder to hydraulic unit.

- Identification:  $\varnothing$  6.5 mm and union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

3 - From hydraulic unit to rear right brake caliper.

4 - From hydraulic unit to rear left brake caliper.





### On hydraulic unit:

A - From hydraulic unit to primary piston circuit of brake master cylinder.

- Identification: Ø 6.5 mm and union nut with thread M12 x 1

B - From hydraulic unit to secondary piston circuit of brake master cylinder.

- Identification: Ø 6.5 mm and union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M10 x 1

2 - From hydraulic unit to front right brake caliper.

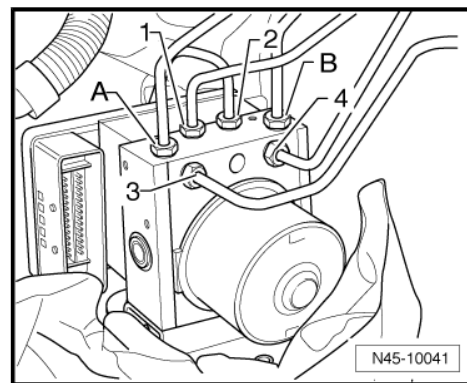
- Identification: Ø 5.25 mm and union nut with thread M12 x 1

3 - From hydraulic unit to rear right brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M10 x 1

4 - From hydraulic unit to rear left brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M12 x 1



## 8.2 Connecting brake lines from tandem brake master cylinder to hydraulic unit, right-hand drive vehicle

### On tandem brake master cylinder:

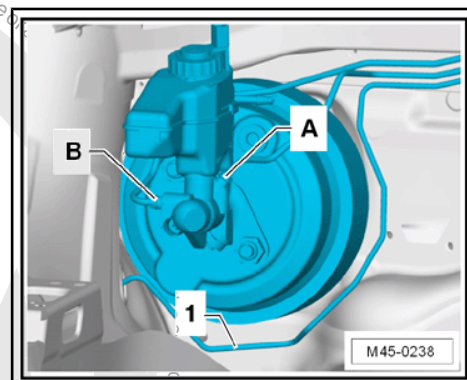
A - Primary piston circuit of brake master cylinder to hydraulic unit.

- Identification: Ø 6.5 mm and union nut with thread M12 x 1

B - Secondary piston circuit of brake master cylinder to hydraulic unit.

- Identification: Ø 6.5 mm and union nut with thread M12 x 1

1 - From hydraulic unit to front right brake caliper.



### On hydraulic unit:

A - From hydraulic unit to primary piston circuit of brake master cylinder.

- Identification: Ø 6.5 mm and union nut with thread M12 x 1

B - From hydraulic unit to secondary piston circuit of brake master cylinder.

- Identification: Ø 6.5 mm and union nut with thread M12 x 1

1 - From hydraulic unit to front left brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M10 x 1

2 - From hydraulic unit to front right brake caliper.

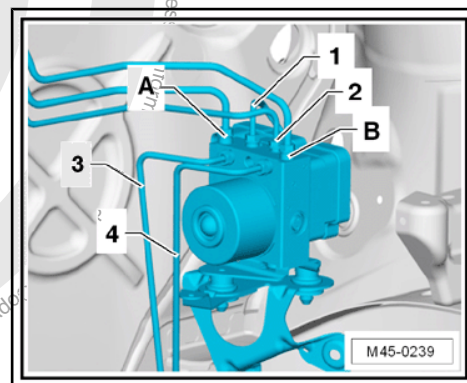
- Identification: Ø 5.25 mm and union nut with thread M12 x 1

3 - From hydraulic unit to rear right brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M10 x 1

4 - From hydraulic unit to rear left brake caliper.

- Identification: Ø 5.25 mm and union nut with thread M12 x 1








## 8.3 Removing control unit and hydraulic unit

### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1410-
- ◆ Brake pedal depressor - V.A.G 1869/2-

<p>V.A.G 1331</p> 	<p>V.A.G 1410</p> 
<p>V.A.G 1869/2</p> 	
	<p>W45-0003</p>



### Sealing plug -1H0 698 311 A-

The transport protection for the contact pins must always be placed on the hydraulic unit after the control unit has been disconnected from the hydraulic unit.

No warranty can be assumed for hydraulic units without transport protection.

1 - Transport protection for contact pins (foam)

2 - Sealing plug M10

3 - Sealing plug M12

### Removing

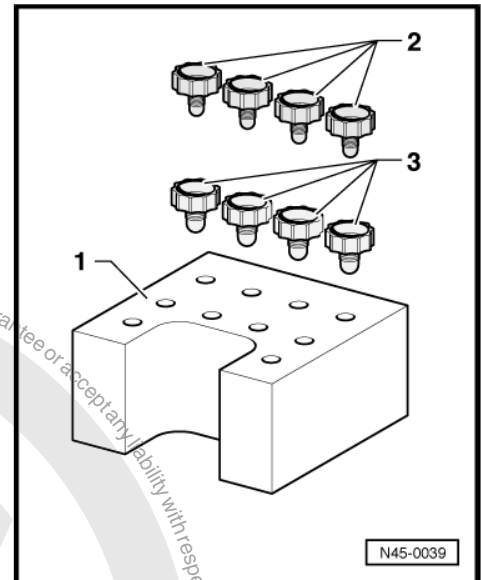
Location:

The control unit is bolted to the hydraulic unit and is located on right in the engine compartment.



### WARNING

***Do not bend the brake lines in the area of the hydraulic unit!***



- Read out and note the existing control unit code.
- Disconnect battery ➔ Electrical system; Rep. Gr. 27 .
- Remove engine cover panel.

### 1.4 I TSI engine:

- Remove pressure pipe and intake connecting pipe with regulating flap control unit ➔ 4-cylinder injection engine (1.4 I direct injection engine, turbocharger and compressor); Rep. Gr. 24 ; Injection system; Part I - assembly overview - intake manifold .
- Remove charge air hose ➔ 4-cylinder injection engine (1.4 I direct injection engine, turbocharger and compressor); Rep. Gr. 21 ; Charge air system .
- Clamp off hose from coolant expansion tank and pull it off.

### 1.9 I diesel engine:

- Remove connecting hose to intake pipe ➔ 4-cylinder diesel engine (2 valve); Rep. Gr. 21 ; Removing and installing charge air system with turbocharger .
- Remove intake manifold flap motor V157 ➔ 4-cylinder diesel engine (2 valve); Rep. Gr. 23 ; Removing and installing mixture preparation - injection .

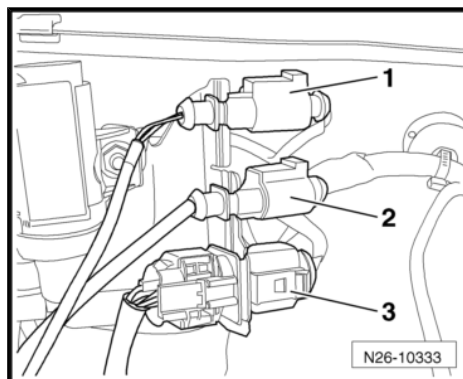
### 2.0 I diesel engine:

- Remove connecting pipe between intake hose and turbocharger.
- Remove toothed belt guard upper part.

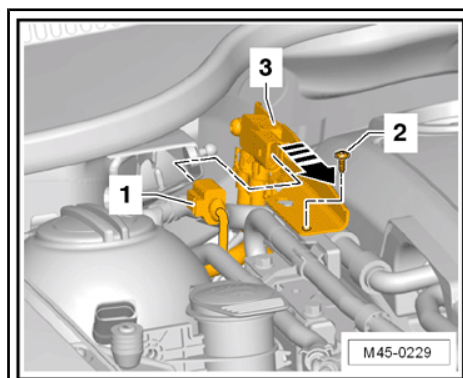
**Diesel engines with diesel particulate filter:**



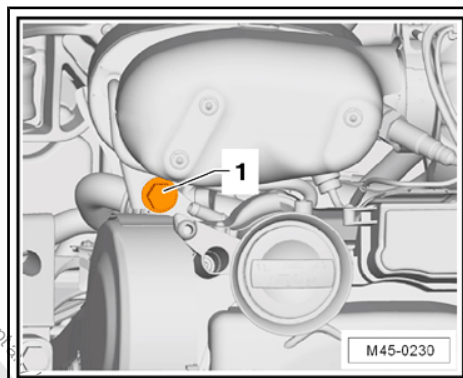
- Separate connector for exhaust gas temperature sender 4 - G648- -2- and Lambda probe -G39- -3-.
- Unclip cable for exhaust gas temperature sender 4 -G648- and Lambda probe -G39- from all brackets on plenum chamber and engine



- Pull off connector -1- on exhaust gas pressure sensor 1 - G450- .
- Unscrew bolt -2- and remove bracket -3- with exhaust gas pressure sensor 1 -G450- in -direction of arrow-.
- Place bracket -3- with exhaust gas pressure sensor 1 -G450- to the front.
- Remove engine cover ⇒ Rep. Gr. 10 .



- Unscrew bolt -1- for particulate filter bracket.
- Raise vehicle.

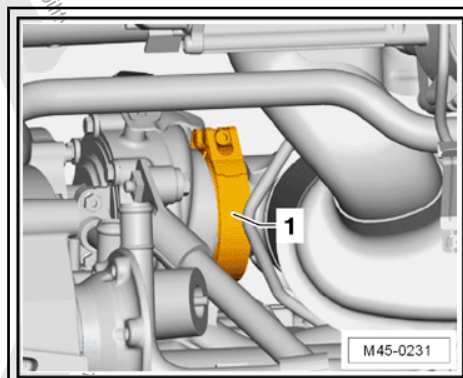


- Loosen clamp -1- for turbocharger/particulate filter connection and remove.



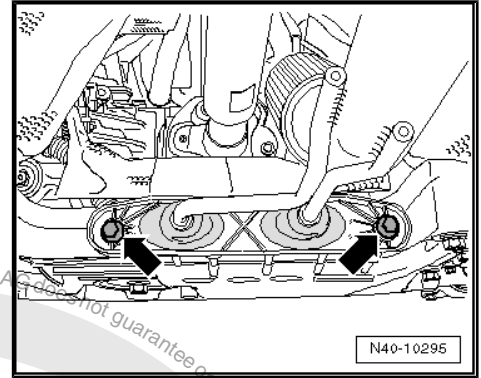
#### Note

*The illustration shows the bolt of the clamp -1- from below. This can also be installed from above in individual cases.*

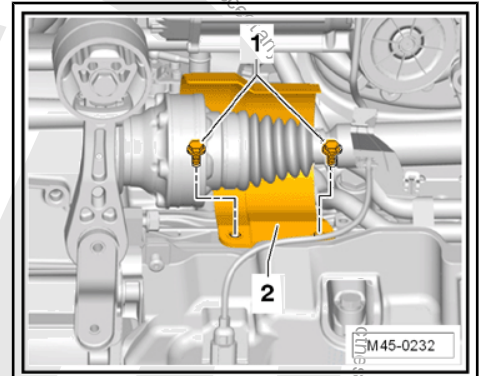




- Detach exhaust system bracket from subframe -arrows-.



- Unscrew bolt -1- and remove drive shaft cover -2-.
- Unscrew right drive shaft from flange, place downwards and secure.
- Loosen double clamp on exhaust pipe and slide to rear.



- Remove nuts -1- and lower particulate filter.
- Remove nuts -2- and take out bracket for particulate filter -3-.
- Lower particulate filter until it lies on the steering gear.

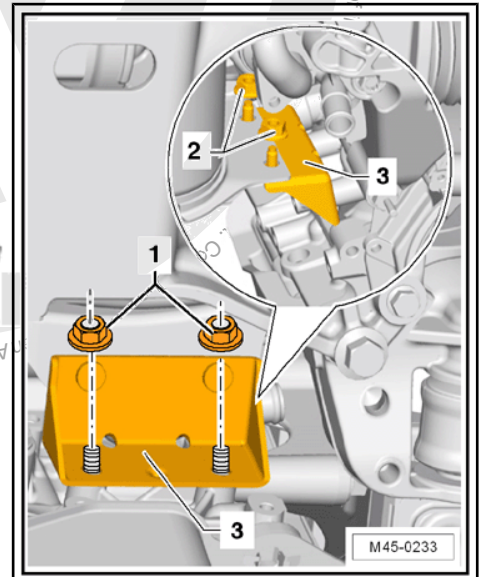


#### Note

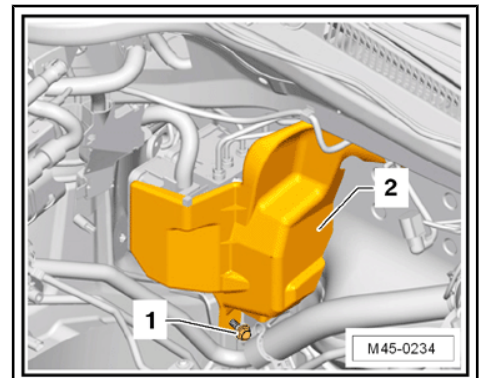
*When lowering, be careful with the cables, the exhaust gas temperature sender 4 -G648- and the Lambda probe -G39- so as to avoid damage.*

- Lower vehicle.

#### Continuation for all vehicles

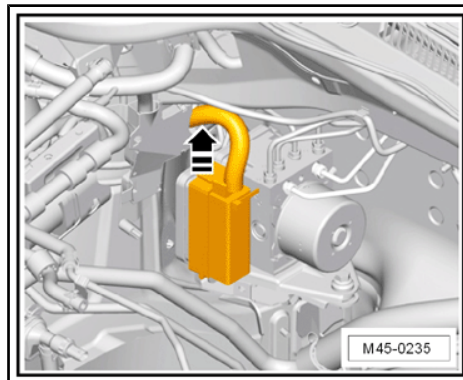


- Unscrew nut -1- and remove heat shield -2- if fitted.



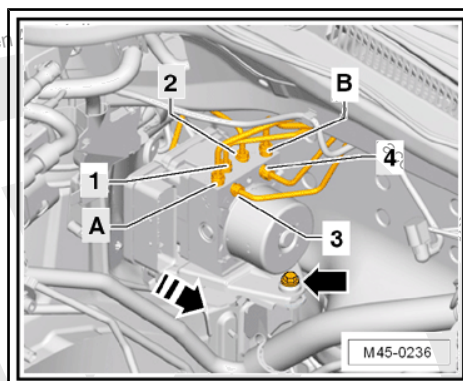


- Release connector from control unit -in direction of arrow- and pull off.
- Apply brake pedal depressor -V.A.G 1869/2- .
- Connect bleeder bottle hose to front left brake caliper bleeder valve and rear left brake caliper bleeder valve and open bleeder valves.
- Depress brake pedal at least 60 mm using brake pedal depressor -V.A.G 1869/2- .
- Close front left and rear left bleeder valve.
- Do not remove brake pedal depressor -V.A.G 1869/2- .
- Place sufficient lint-free cloths under the control unit and hydraulic unit.



**Ensure no brake fluid gets onto contacts.**

- First identify the two brake master cylinder brake lines -A and B- and unscrew from the hydraulic unit.
- Immediately seal brake lines and threaded holes with sealing plugs -1H0 698 311 A- .
- Identify brake lines (brake calipers) -1- to -4- and unscrew.
- Immediately seal brake lines and threaded holes with sealing plugs -1H0 698 311 A- .
- Turn hexagon fitting bolt out of retainer -arrow-.
- Pull hydraulic unit with control unit and bracket sideways out of rubber dampers in the console in -direction of arrow- and turn upside down.
- Unbolt retainer from hydraulic unit in engine compartment and remove.
- Remove hydraulic unit together with control unit.



## 8.4 Unbolting control unit from hydraulic unit



**Note**

- Place hydraulic unit with control unit upwards on a clean flat level surface.
- Unscrew Torx bolts out of control unit.



- Without canting it, pull control unit off from hydraulic unit -arrow-.
- Carefully pull all seals from hydraulic unit contact pins.

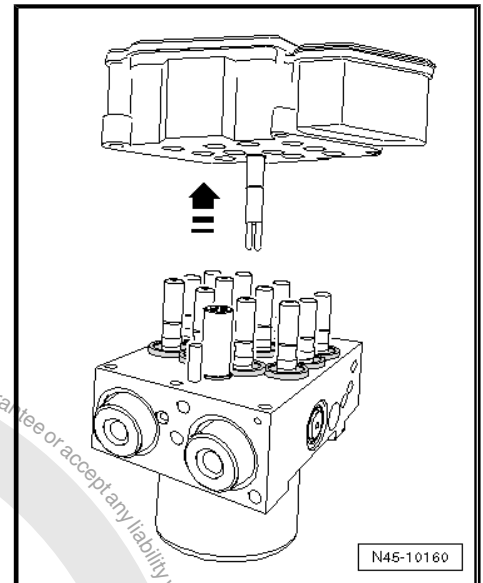


#### WARNING

- ◆ *Printed circuit board becomes visible when control unit is removed.*
- ◆ *No moisture or particles of dirt may enter control unit.*
- ◆ *Avoid electrostatic charge!*

- Cover control unit solenoids with a lint-free cloth.

After separating control unit and hydraulic unit, use transport protection for contact pins.



## 8.5 Installing new control unit



#### WARNING

*Severe shocks (e.g. dropping, impact) may destroy control unit. Control unit must not then be used.*

- Clean surfaces before assembling.
- Push all seals -A- over contact pins slightly.
- Without canting it, place control unit onto hydraulic unit.

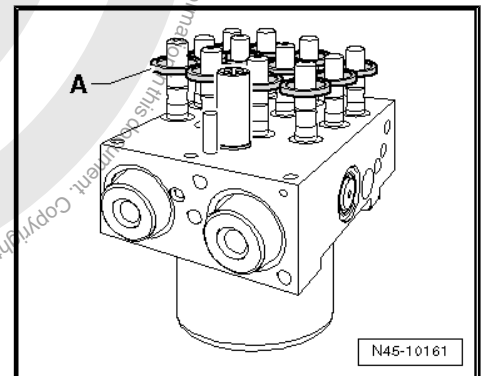
The seals are thus moved to end position.

- Tighten hydraulic unit and control unit diagonally in stages to specified torque with enclosed new Torx bolts.



#### Note

- ◆ *A new control unit may be mounted on an existing hydraulic unit max. twice to guarantee impermeability of the elastic seal.*
- ◆ *A control unit which has already been operated in a vehicle must not be installed a second time.*



## 8.6 Installing control unit and hydraulic unit



#### Note

- ◆ *Remove sealing plugs from new hydraulic unit only when the corresponding brake line is going to be fitted.*
- ◆ *If sealing plugs are removed too early from the hydraulic unit, brake fluid can escape, and it can then no longer be guaranteed that the unit can be sufficiently filled and bled.*

- Install in reverse order.



#### WARNING

*Ensure that rubber dampers of retainer are not pressed out of bracket when installing. After installing, check hydraulic unit with control unit for proper seating, otherwise malfunctions can occur.*

- Remove brake pedal depressor -V.A.G 1869/2- .
- Bleed brake system ⇒ [page 131](#) .
- Code control unit -J104- with ⇒ Vehicle diagnosis, testing and information system VAS 5051 in "Guided fault finding".

To do this, basic setting of the steering angle sender -G85- , the lateral acceleration sender -G200- and the brake pressure sender -G201- must be carried out.

#### Specified torques

Component	Specified torque
Control unit to hydraulic unit ♦ Use new bolts!	2 Nm + 0.8 Nm
Hexagon bolt of hydraulic unit to bracket	8 Nm
Hexagon fitted bolt, retainer to bracket	8 Nm
Brake lines to ABS assembly:	
Thread M10 x 1	14 Nm
Thread M12 x 1	14 Nm



## 9 Removing and installing parts of ABS system on front and rear axle

### 9.1 Removing and installing parts of ABS system on front axle

#### 1 - ABS speed sensor

- ❑ Before inserting sensor, clean inner surface of fitting hole and coat with hot bolt paste -G 052 112 A3-

- ❑ Removing and installing  
⇒ [page 53](#)

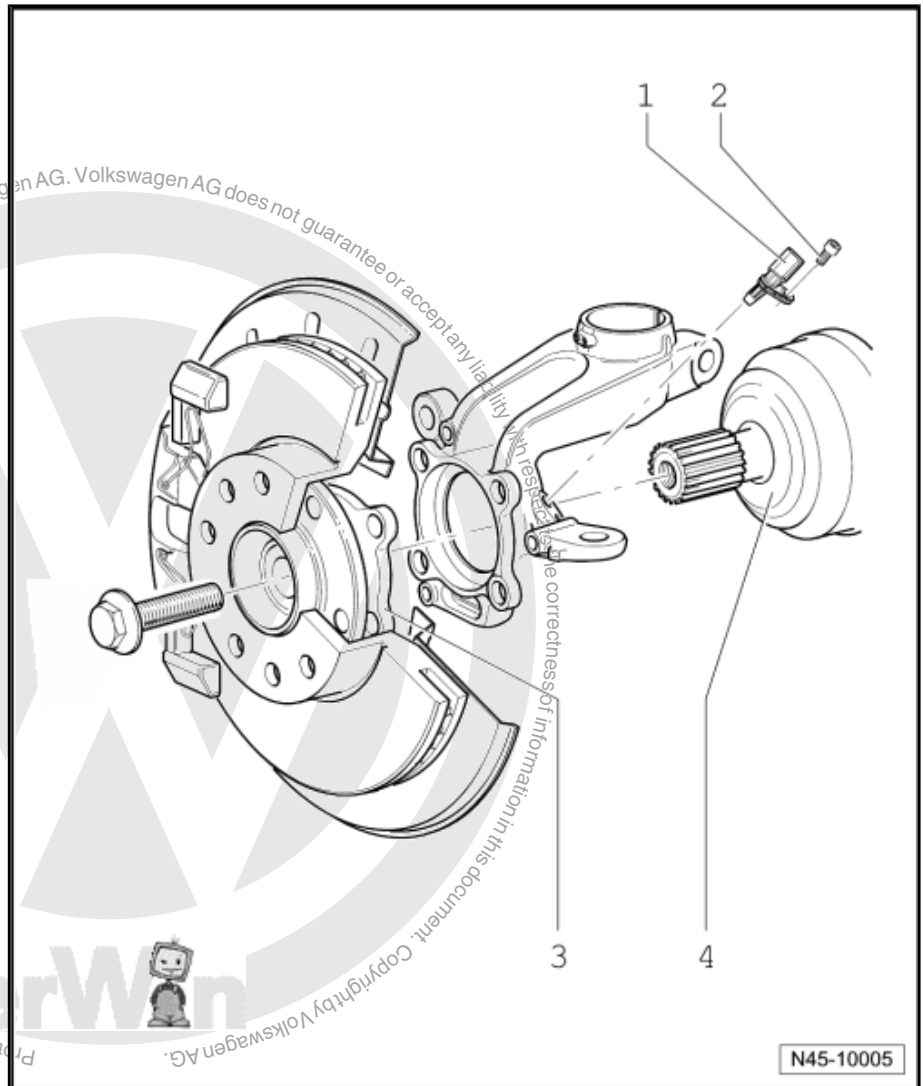
#### 2 - Hexagon socket head bolt

- ❑ 8 Nm

#### 3 - Wheel bearing/hub unit

- ❑ ABS sensor ring is installed in wheel bearing.

#### 4 - Drive shaft



#### 9.1.1 Removing and installing speed sensor on front axle

##### Removing

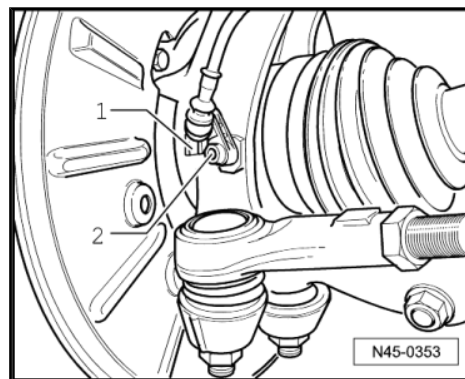
- Raise vehicle.



- Separate connector -1- from speed sensor wire and from speed sensor.
- Remove bolt -2- from wheel bearing housing.
- Pull ABS speed sensor out of wheel bearing housing.

#### Installing

- Before inserting sensor, clean inner surface of fitting hole and coat speed sensor thoroughly with hot bolt paste -G 052 112 A3- .
- Insert speed sensor into hole in wheel bearing housing and tighten bolt to 8 Nm.
- Connect speed sensor to speed sensor wire.



## 9.2 Removing and installing parts of anti-lock brake system on rear axle (front-wheel drive)

### 1 - ABS speed sensor

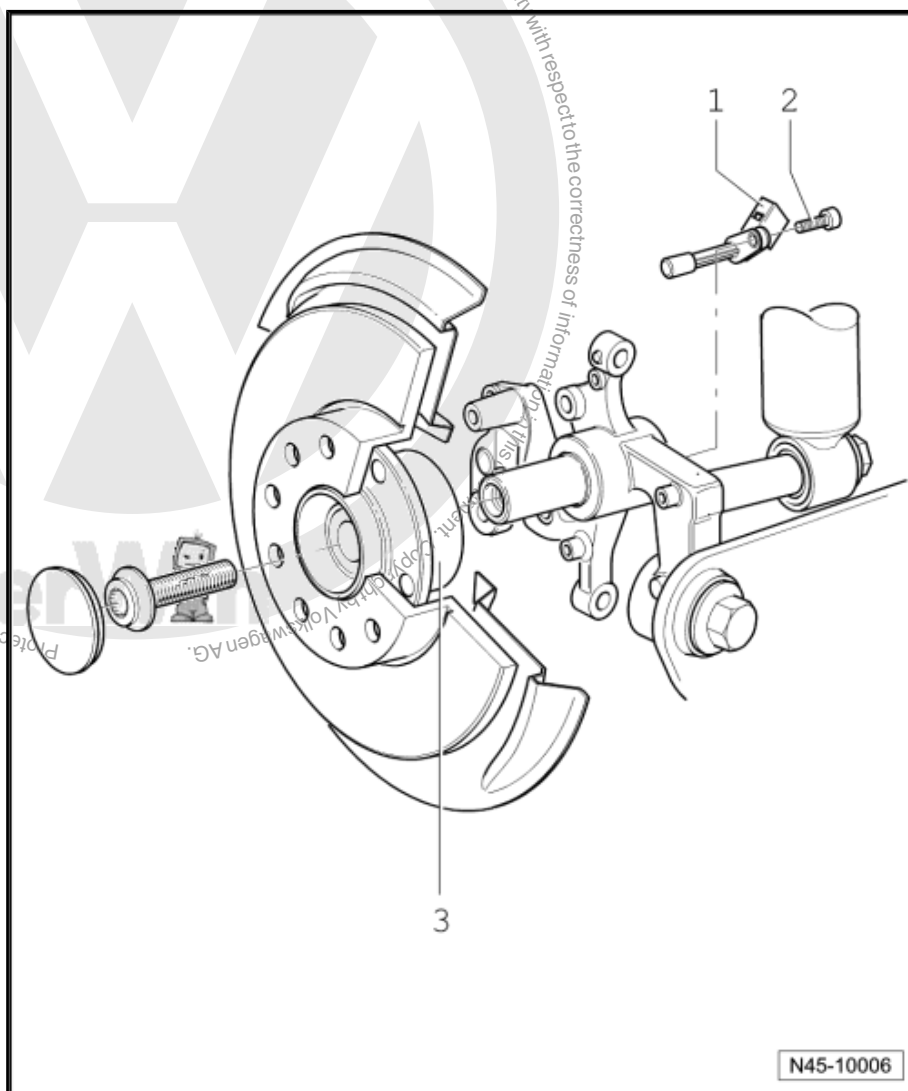
- ☐ Before inserting sensor, clean inner surface of fitting hole and coat with hot bolt paste -G 052 112 A3-.
- ☐ Removing and installing  
⇒ [page 55](#) .

### 2 - Hexagon socket head bolt

- ☐ 8 Nm

### 3 - Wheel bearing/hub unit

- ☐ ABS sensor ring is installed in wheel bearing.





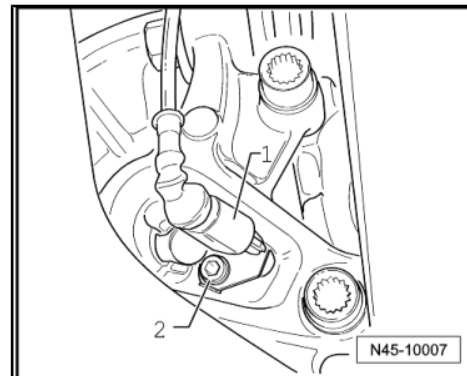
## 9.2.1 Removing and installing speed sensor on rear axle

### Removing

- Raise vehicle.
- Separate connector -1- from speed sensor wire and from speed sensor.
- Remove bolt -2- from wheel bearing housing.
- Pull ABS speed sensor out of wheel bearing housing.

### Installing

- Before inserting sensor, clean inner surface of fitting hole and coat speed sensor thoroughly with hot bolt paste -G 052 112 A3- .
- Insert speed sensor into hole in wheel bearing housing and tighten bolt to 8 Nm.
- Connect speed sensor to speed sensor wire.



## 9.3 Removing and installing parts of anti-lock brake system on rear axle (four-wheel drive)

### 1 - ABS speed sensor

- ☐ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.

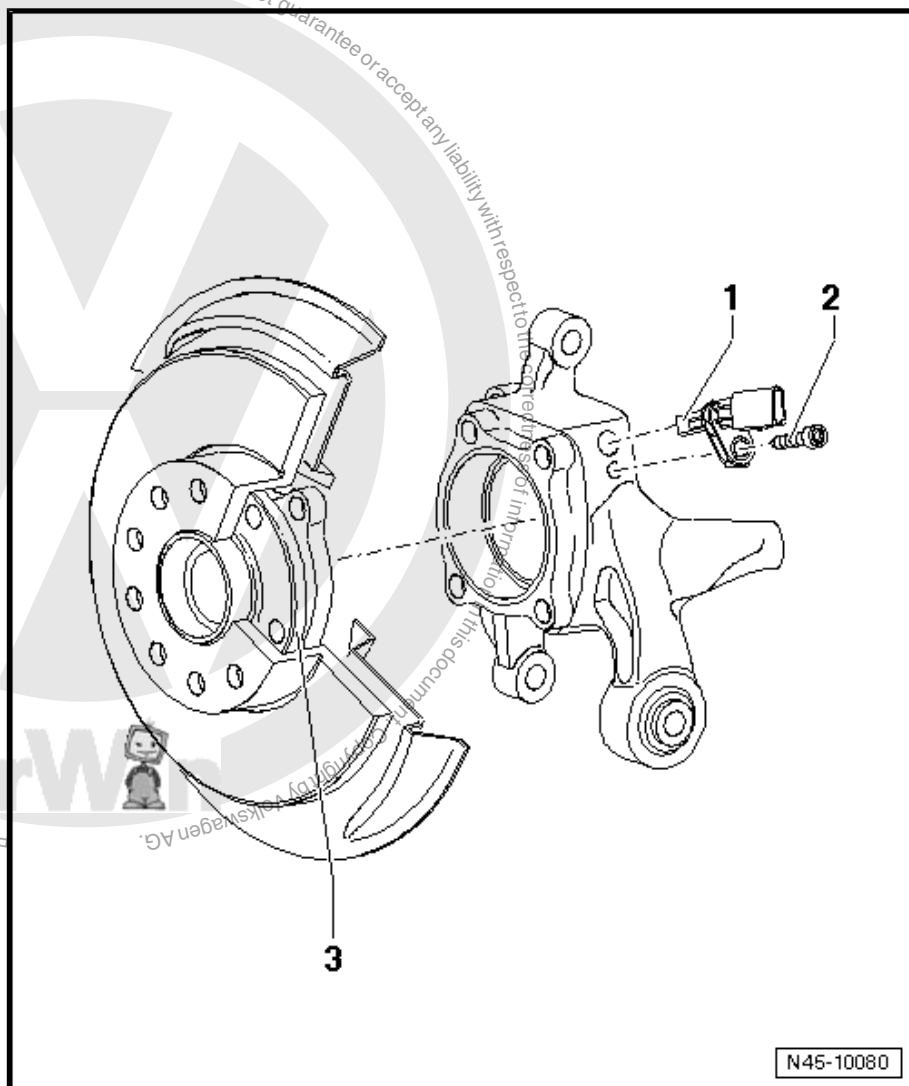
- ☐ Removing and installing  
⇒ [page 56](#) .

### 2 - Hexagon socket head bolt

- ☐ 8 Nm

### 3 - Wheel bearing/hub unit

- ☐ ABS sensor ring is installed in wheel bearing.





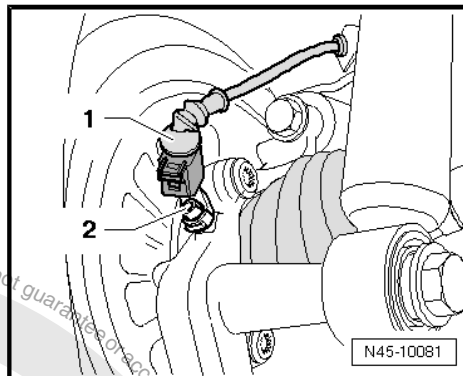
### 9.3.1 Removing and installing speed sensor on rear axle

#### Removing

- Raise vehicle.
- Separate connector -1- from speed sensor wire and from speed sensor.
- Remove bolt -2- from wheel bearing housing.
- Pull ABS speed sensor out of wheel bearing housing.

#### Installing

- Before inserting speed sensor, clean hole inner surface and coat speed sensor all-round with high-temperature paste G 052 112 A3.
- Insert speed sensor into hole in wheel bearing housing and tighten bolt to 8 Nm.
- Connect speed sensor to speed sensor wire.





## 10 Removing and installing parts of ESP system

### 10.1 Removing and installing ESP sensor unit -G419-

The ESP sensor unit -G419- comprises a lateral acceleration sender -G200- and a yaw rate sender -G202-. They are installed in a housing under the front passenger seat.

After exchanging the ESP sensor unit -G419- perform basic setting for lateral acceleration sender -G200-.

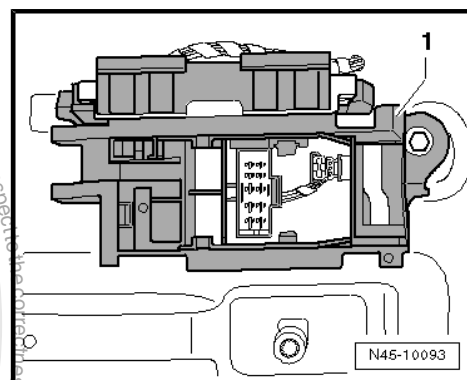


#### WARNING

*Severe shocks (e.g. dropping, impact) may destroy the ESP sensor unit -G419-. The ESP sensor unit -G419- may not then be used any further.*

#### Removing ESP sensor unit -G419-

- Remove front passenger seat ⇒ General body repairs, interior; Rep. Gr. 72 ; Front seats .
- Remove sill panel trim ⇒ General body repairs, interior; Rep. Gr. 68 ; Sill panel trims and raise the carpet.
- Lift carpet and lay to the side.
- Remove coupling station -1-.
- Raise floor covering.



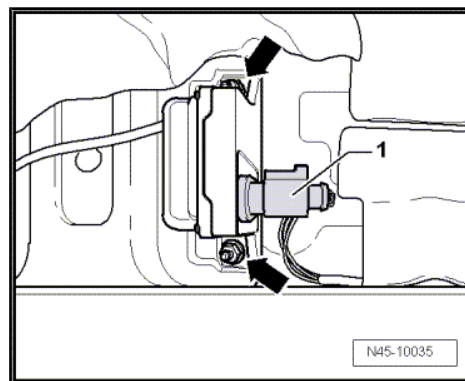


- Pull connector -1- off ESP sensor unit -G419- .
- Remove the two securing nuts -arrows-.
- Remove ESP sensor unit -G419- .

#### Installing ESP sensor unit -G419-

- Carry out installation in the reverse sequence, noting the following:

When installing the ESP sensor unit -G419- , make sure it is correctly seated in its bracket and is free of stress.



#### Note

*Do not use the securing nuts to forcibly position the ESP sensor unit -G419- .*

- Tighten securing nuts to 9 Nm.
- Carry out basic setting for lateral acceleration sender -G200-  
⇒ Vehicle diagnosis, testing and information system VAS 5051.

## 10.2 Removing and installing steering angle sender -G85-

The steering angle sender is located between the steering wheel and steering column switch ⇒ Electrical system; Rep. Gr. 94 ; Lights, lamps, switches - outside; Steering column switch .

- After installing, perform basic settings for steering angle sender -G85- .

Connecting -VAS 5051- and selecting functions ⇒ [page 12](#) .



#### Note

*In vehicles equipped with an electromechanical power steering of the 3rd generation, the steering angle sender is located in the steering box from week 27/08.*

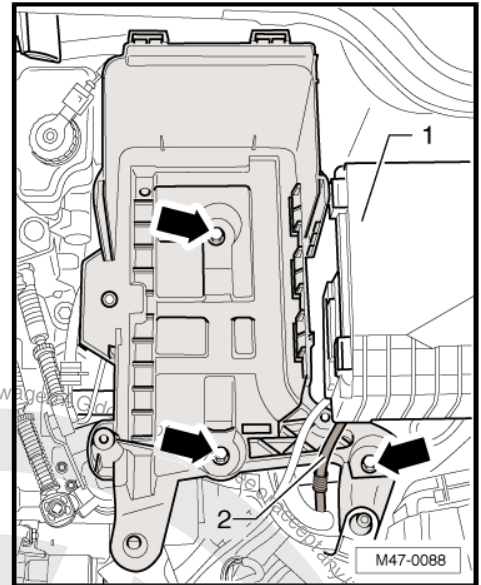
## 10.3 Removing and installing brake servo vacuum sender -G483-

### Removing

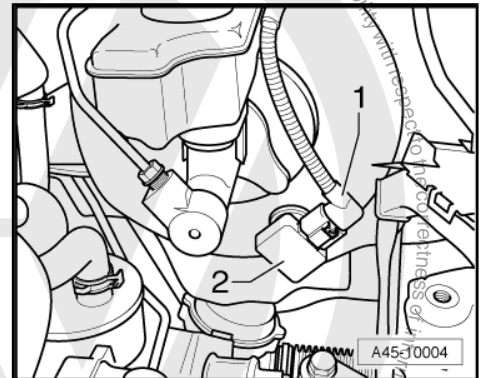
- Remove battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing batteries .



- Open cover -1- and unscrew wiring -2- from carrier.
- Unscrew bolts -arrows- and remove battery tray.



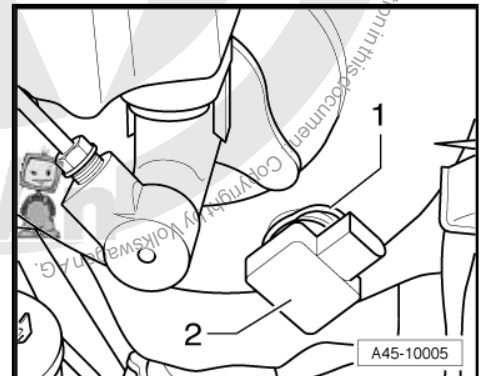
- Disconnect connector -1- from brake servo vacuum sender -G483- -2-.
- Insert screwdriver into circlip groove between stop and one end of circlip.



- Now press circlip -1- out of groove until brake servo vacuum sender -G483- -2- can be pulled out of brake servo.

### Installing

- Install in reverse order.





## 46 – Brakes - mechanism

### 1 Repairing front brakes, FS III brake caliper



#### Note

- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Use the brake filling and bleeding equipment -VAS 5234- or the extraction unit -V.A.G 1869/4- to draw off brake fluid from the brake fluid reservoir.
- ◆ Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor -V.A.G 1869/2- (when doing this, release pressure in system).

#### 1 - Hexagon bolt / Torx bolt

- ☐ 12 Nm
- ☐ M6 x 10 hexagon bolt revised to M6 x 12 Torx bolt
- ☐ Replace hexagon bolt with hexagon bolt and Torx bolt with Torx bolt

#### 2 - Brake disc

- ☐ Ventilated, Ø 280 mm
- ☐ Thickness: 22 mm
- ☐ Wear limit: 19 mm
- ☐ Always renew on both sides of an axle.
- ☐ Unscrew brake caliper prior to removing.

#### 3 - Cross-head screw / Torx screw

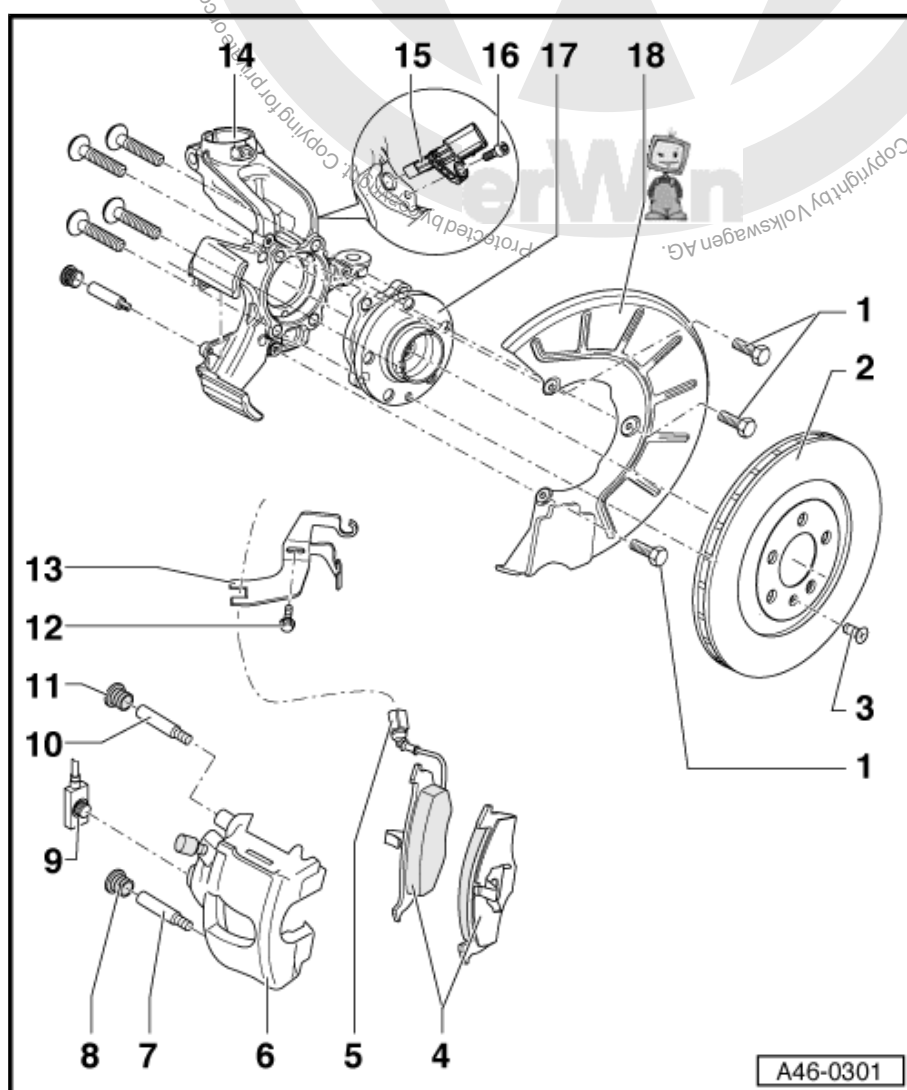
- ☐ 4 Nm

#### 4 - Brake pads

- ☐ Thickness: 14 mm not including backplate
- ☐ With brake pad wear indicator
- ☐ When wear reaches a predetermined limit (approx 4 mm) the warning lamp in dash panel insert comes on.
- ☐ Wear limit: 2 mm not including backplate
- ☐ Check thickness ⇒ Maintenance ; Booklet 20.1 .
- ☐ Always renew on both sides of an axle.
- ☐ Removing and installing ⇒ [page 61](#) .

#### 5 - Connector

- ☐ Brake pad wear indicator





## 6 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 64](#) .
- ☐ Repairing ⇒ [page 114](#)

## 7 - Guide pin

- ☐ 30 Nm

## 8 - Cover cap

- ☐ Remove

## 9 - Brake hose with banjo union and banjo bolt

- ☐ 35 Nm

## 10 - Guide pin

- ☐ 30 Nm

## 11 - Cover cap

- ☐ Remove

## 12 - Bolt

## 13 - Bracket

## 14 - Wheel bearing housing

- ☐ With integrated brake carrier.

## 15 - ABS speed sensor

- ☐ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.

## 16 - Hexagon socket head bolt

- ☐ 8 Nm

## 17 - Wheel bearing/hub unit

- ☐ ABS sensor ring is installed in wheel bearing.

## 18 - Splash plate

# 1.1 Removing and installing brake pads, brake caliper FS III

### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

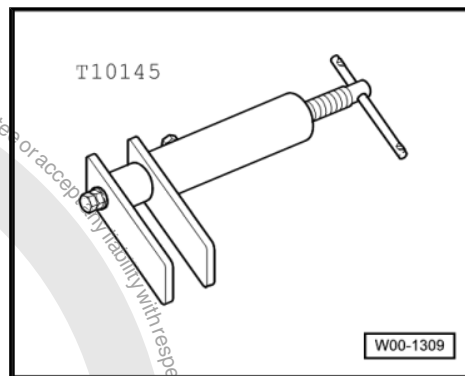
V.A.G 1331



W00-0427



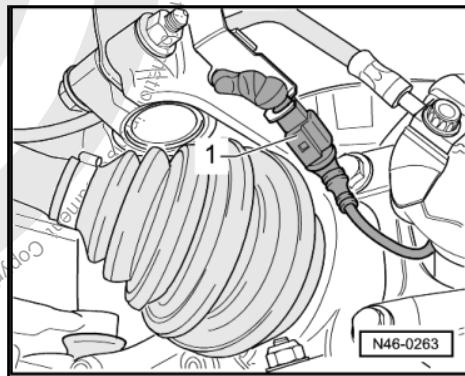
◆ Piston resetting appliance -T10145-



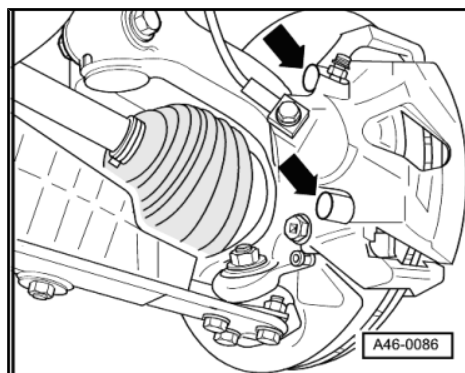
**Removing**

**Mark brake pads/linings when removing if they are to be reused.  
Fit in same position when installing, or braking will be uneven.**

- Remove wheels.
- Disconnect connector -1- for brake pad wear indicator.



- Remove cover caps -arrows-.





- Unscrew both guide pins -arrows- and remove from brake caliper.
- Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.
- Take brake pads out of brake caliper.

#### Cleaning:



#### WARNING

***Do not blow out brake system with compressed air; the resulting dust constitutes a health hazard!***

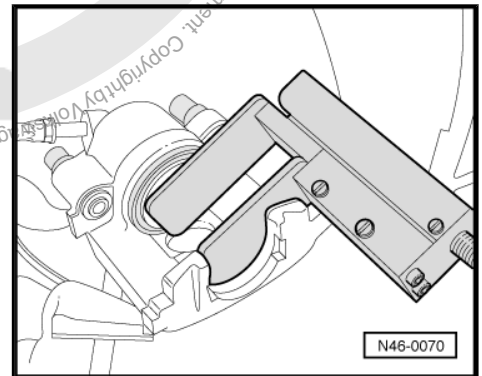
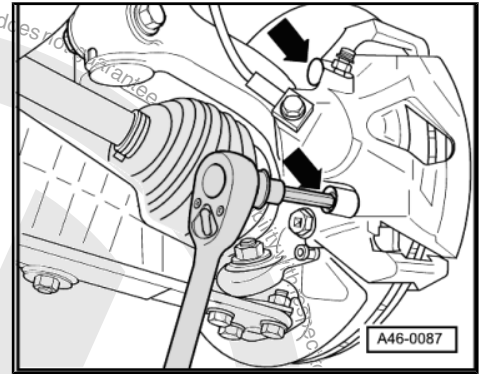
- Thoroughly clean brake carrier and contact surfaces for brake pads and remove corrosion.

**Use only methylated spirits for cleaning the brake caliper housing.**

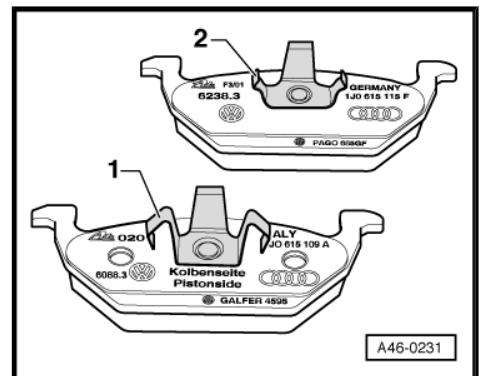
#### Installing

**Before pressing piston back into cylinder with piston resetting tool, draw off brake fluid from brake fluid reservoir. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.**

- Press piston back.

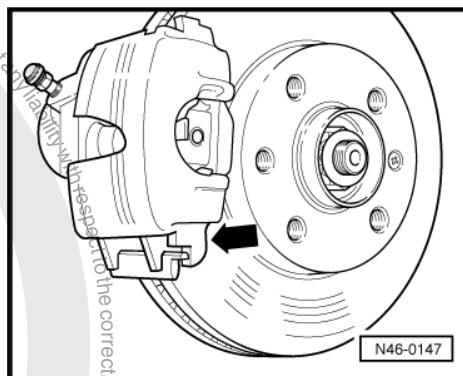


- Insert inner brake pad (piston side) -1- and outer brake pad -2- into brake caliper with retaining springs.
- ◆ Inner brake pad (piston side) with large 3-finger clip -1-.
- ◆ Outer brake pad with small 3-finger clip -2- (coloured black).



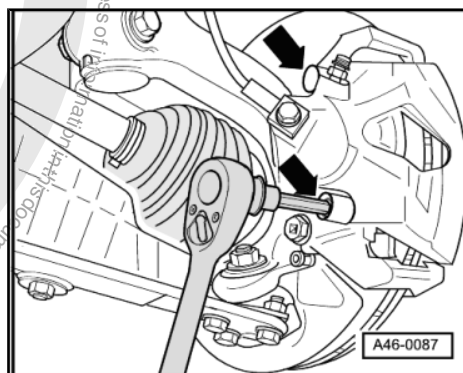


- First position brake caliper with brake pads at bottom -arrow- of brake carrier.



- Bolt brake caliper to brake carrier with both guide pins.
- Brake caliper stud must be positioned behind brake carrier guide!
- Fit both cover caps.
- Reconnect connector for brake pad wear indicator.
- Fit wheels.

Specified torque of wheel bolts  $\Rightarrow$  Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts.



#### Note

- ♦ Every time after changing pads, depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in their normal operating position.
- ♦ Check brake fluid level after changing brake pads.

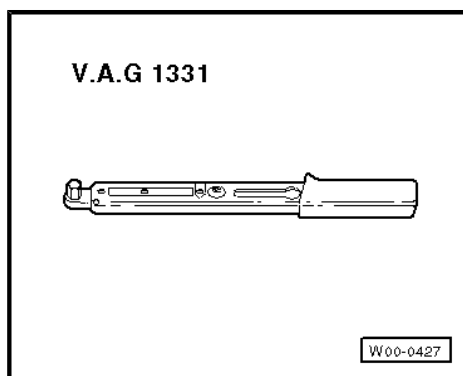
#### Specified torques

Component	Specified torque
Guide pin to brake carrier	30 Nm

## 1.2 Removing and installing brake caliper, FS III brake caliper

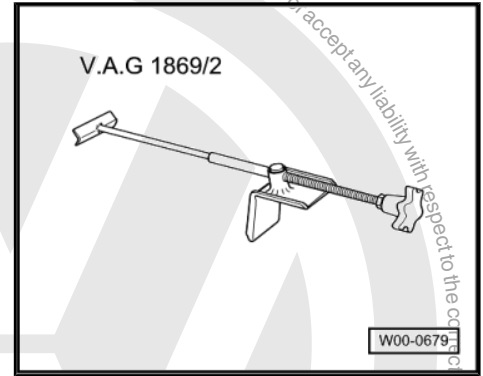
#### Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-





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



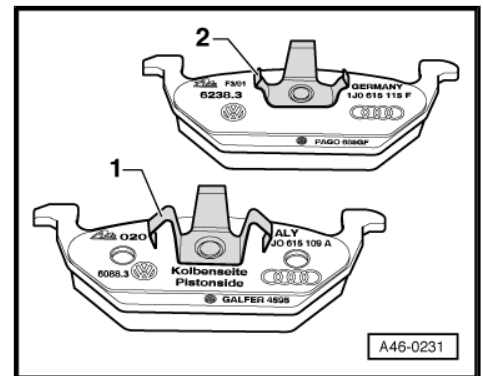
### Removing

This procedure applies only to exchanging or the following repair work on the brake caliper.

- Remove wheels.
- Separate connector for brake pad wear indicator.
- Connect bleeder bottle hose to brake caliper bleeder valve and open bleeder valve.
- Apply brake pedal depressor -V.A.G 1869/2-
- Close bleeder valve and remove bleeder bottle.
- Disconnect brake hose.
- Pull both caps out of bearing bushes of brake caliper.
- Loosen both guide pins and remove from brake caliper.
- Pull brake caliper off brake carrier.
- Remove brake pads from brake caliper.

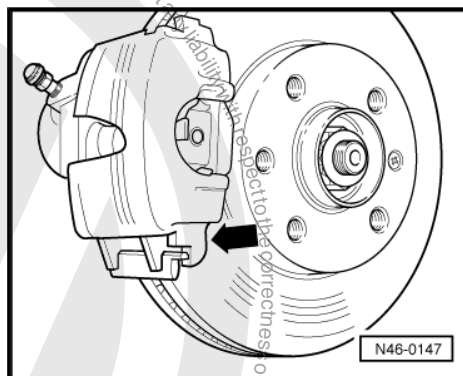
### Installing

- Piston is pressed back.
- Insert inner brake pad (piston side) -1- and outer brake pad -2- into brake caliper with retaining springs.
- ◆ Inner brake pad (piston side) with large 3-finger clip -1-.
- ◆ Outer brake pad with small 3-finger clip -2- (coloured black).

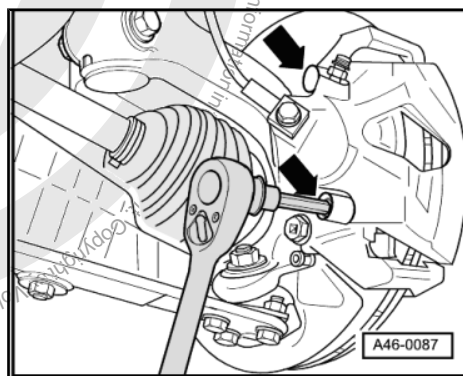




- First position brake caliper with brake pads at bottom -arrow- of brake carrier.



- Bolt brake caliper to brake carrier with both guide pins.
- Brake caliper stud must be positioned behind brake carrier guide!
- Fit both cover caps.
- Bolt brake hose to brake caliper.
- Remove brake pedal depressor -V.A.G 1869/2- .
- Reconnect connector for brake pad wear indicator.
- Bleed brake system => [page 131](#) .
- Fit wheels.



Specified torque of wheel bolts => Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts



#### Note

- ◆ *Firmly depress brake pedal several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level.*

#### Specified torques

Component	Specified torque
Guide pin to brake carrier	30 Nm
Brake hose to brake caliper	35 Nm



## 2 Repairing front brakes, FN 3 brake caliper



### Note

- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Use the brake filling and bleeding equipment -VAS 5234- or the upgrade kit and extraction unit -V.A.G 1869/4- to extract brake fluid from brake fluid reservoir.
- ◆ Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor -V.A.G 1869/2- (when doing this, release pressure in system).

### Assembly overview, FN3, 15 inch:

#### 1 - Bolt

- 4 Nm

#### 2 - Brake disc

- Ventilated, Ø 288 mm
- Thickness: 25 mm
- Wear limit: 22 mm
- Always renew on both sides of an axle.
- Unscrew brake caliper prior to removing.

#### 3 - Brake pads

- Thickness: 14 mm not including backplate
- With break pad wear indicator
- When wear reaches a predetermined limit (approx. 4 mm) the warning lamp in the dash panel insert comes on.
- Wear limit: 2 mm not including backplate
- Check thickness ⇒ Maintenance ; Booklet 20.1 .
- Always renew on both sides of an axle.
- Removing and installing ⇒ [page 70](#) .

#### 4 - Retaining spring

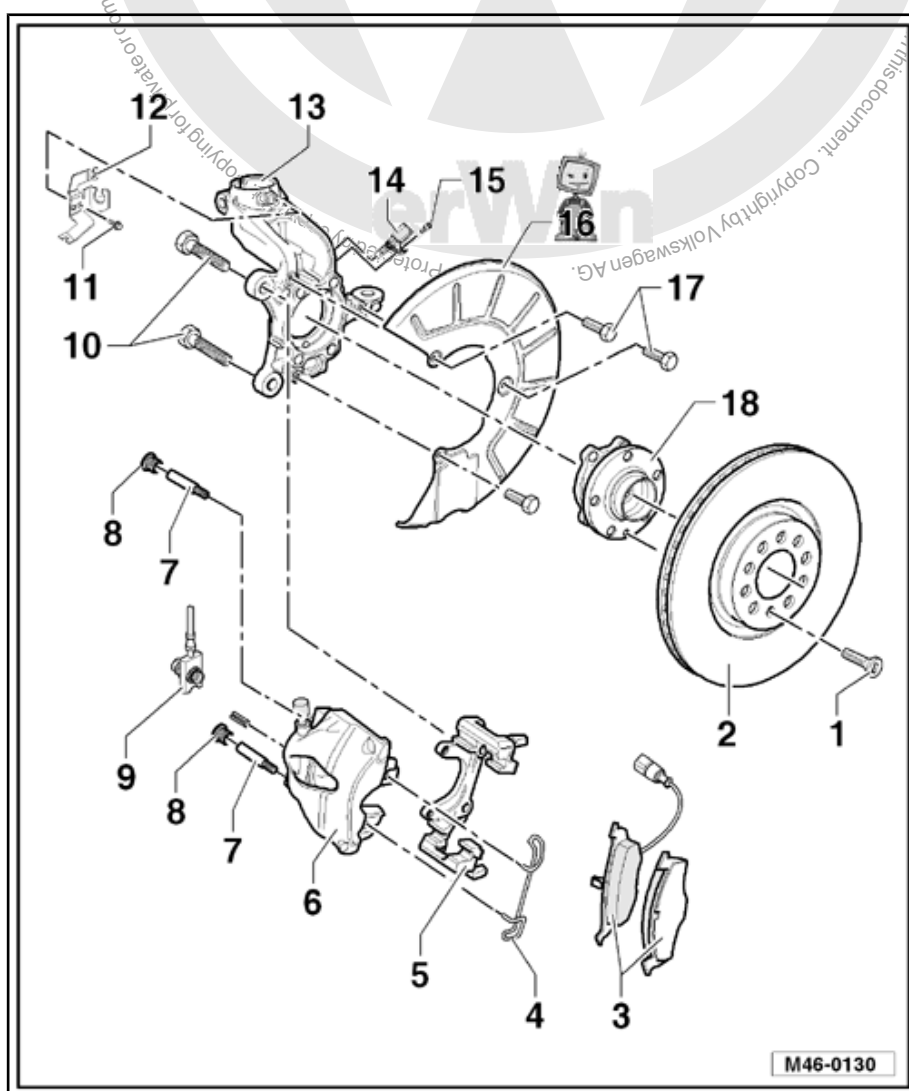
- Insert into both holes in brake caliper.

#### 5 - Brake carrier

- Bolt to wheel bearing housing.

#### 6 - Brake caliper

- Do not disconnect brake hose when changing pads.
- Removing and installing ⇒ [page 73](#) .
- Repairing ⇒ [page 117](#)





**7 - Guide pin**

- ☐ 30 Nm

**8 - Cover cap**

- ☐ Remove

**9 - Brake hose with banjo union and banjo bolt**

- ☐ 35 Nm

**10 - Ribbed combi-bolt**

- ☐ 190 Nm
- ☐ Clean if reused.

**11 - Bolt**

**12 - Bracket**

**13 - Wheel bearing housing**

- ☐ With bolted brake carrier.

**14 - ABS speed sensor**

- ☐ Before inserting sensor, clean inner surface of fitting hole and coat with hot bolt paste -G 052 112 A3-

**15 - Hexagon socket head bolt**

- ☐ 8 Nm

**16 - Splash plate**

**17 - Hexagon bolt / Torx bolt**

- ☐ 12 Nm
- ☐ M6 x 10 hexagon bolt revised to M6 x 12 Torx bolt
- ☐ Replace hexagon bolt with hexagon bolt and Torx bolt with Torx bolt

**18 - Wheel bearing/hub unit**

- ☐ ABS sensor ring is installed in wheel bearing.

**Assembly overview, FN3, 16 inch:**



### 1 - Bolt

- ☐ 12 Nm

### 2 - Brake disc

- ☐ Ventilated,  $\varnothing$  312 mm
- ☐ Thickness: 25 mm
- ☐ Wear limit: 22 mm
- ☐ Always renew on both sides of an axle.
- ☐ Remove brake caliper and brake carrier prior to removing.

### 3 - Bolt

- ☐ 4 Nm

### 4 - Brake pads

- ☐ Thickness: 14 mm not including backplate
- ☐ With break pad wear indicator
- ☐ When wear reaches a predetermined limit (approx. 4 mm) the warning lamp in the dash panel insert comes on.
- ☐ Wear limit: 2 mm not including backplate
- ☐ Check thickness  $\Rightarrow$  Maintenance ; Booklet 20.1 .
- ☐ Always renew on both sides of an axle.
- ☐ Removing and installing  $\Rightarrow$  [page 70](#) .

### 5 - Retaining spring

- ☐ Insert into both holes in brake caliper.

### 6 - Brake carrier

- ☐ Bolt to wheel bearing housing.

### 7 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing  $\Rightarrow$  [page 73](#) .
- ☐ Repairing  $\Rightarrow$  [page 117](#)

### 8 - Guide pin

- ☐ 30 Nm

### 9 - Cover cap

- ☐ Remove

### 10 - Brake hose with banjo union and banjo bolt

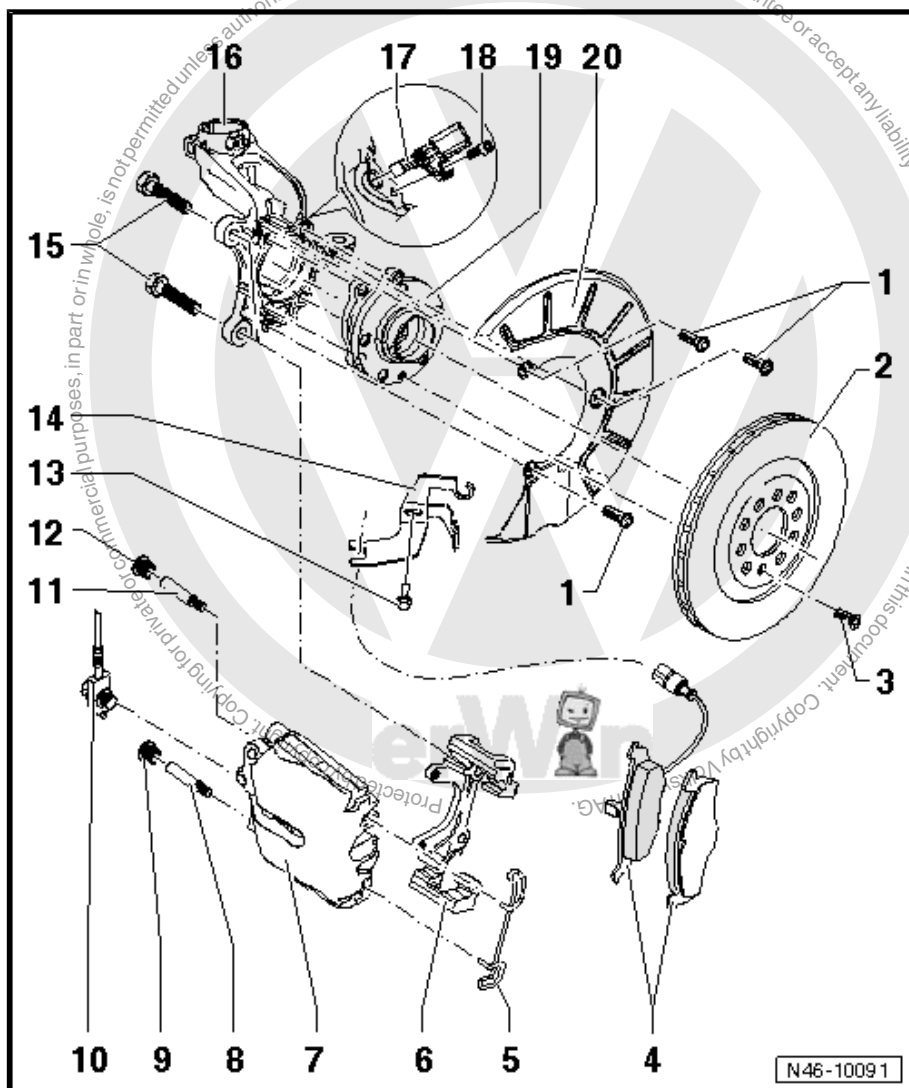
- ☐ 35 Nm

### 11 - Guide pin

- ☐ 30 Nm

### 12 - Cover cap

- ☐ Remove





**13 - Bolt**

**14 - Bracket**

**15 - Ribbed combi-bolt**

- ☐ 190 Nm
- ☐ Clean if reused.

**16 - Wheel bearing housing**

- ☐ With bolted brake carrier.

**17 - ABS speed sensor**

- ☐ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.

**18 - Hexagon socket head bolt**

- ☐ 8 Nm

**19 - Wheel bearing/hub unit**

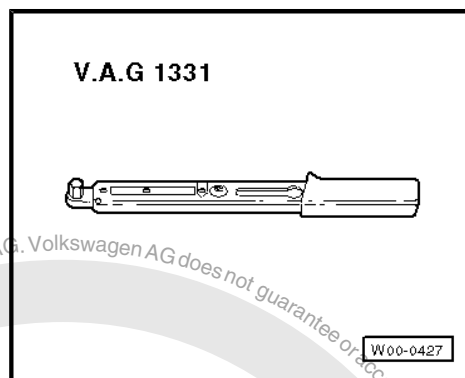
- ☐ ABS sensor ring is installed in wheel bearing.

**20 - Splash plate**

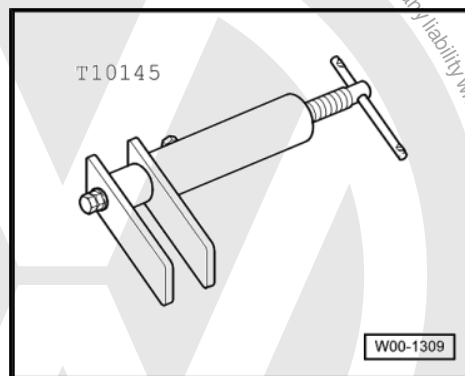
## 2.1 Removing and installing brake pads, brake caliper FN 3

**Special tools and workshop equipment required**

- ◆ Torque wrench -V.A.G 1331-



- ◆ Piston resetting appliance -T10145-



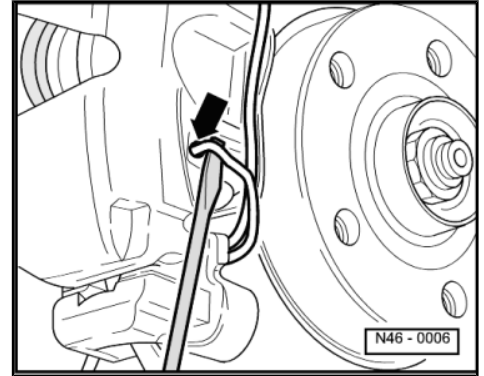
### Removing

**Mark brake pads/linings when removing if they are to be reused.  
Fit in same position when installing, or braking will be uneven.**

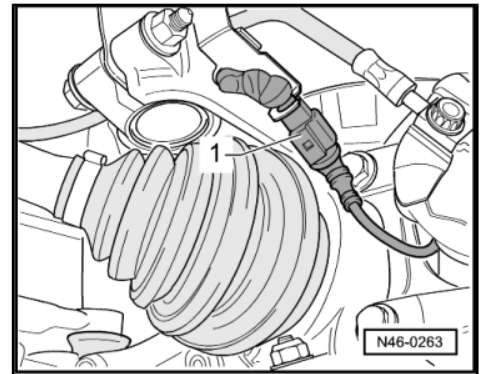
- Remove wheels.



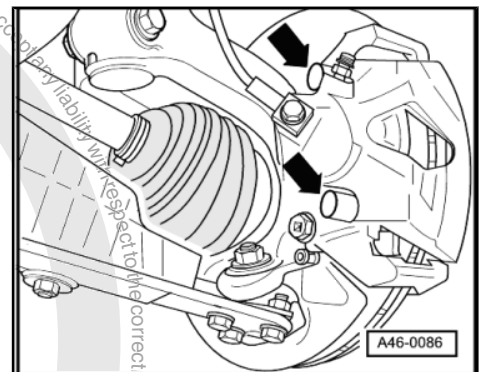
- Lever brake pad retaining spring out from brake caliper -arrow- with a screwdriver and remove.



- Disconnect connector -1- for brake pad wear indicator.



- Remove cover caps -arrows-.





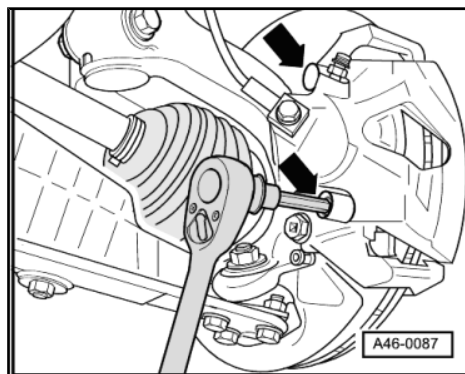
- Unscrew both guide pins -arrows- and remove from brake caliper.
- Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.
- Take brake pad out of brake caliper or from brake carrier.

#### Cleaning:



#### WARNING

**Do not blow out brake system with compressed air; the resulting dust constitutes a health hazard!**



- Thoroughly clean brake carrier and contact surfaces for brake pads and remove corrosion.
- Clean brake caliper, in particular the bonding surface for the brake pad. It must be free of adhesive and grease residues.

**Use only methylated spirits for cleaning the brake caliper housing.**

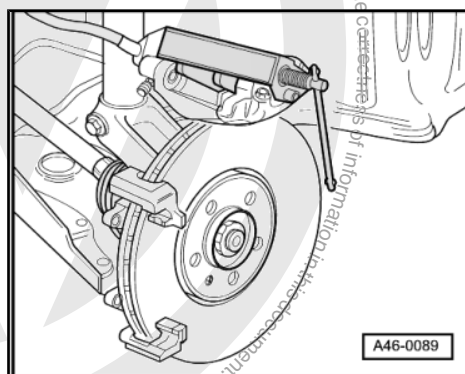
#### Installing

**Before pressing piston back into cylinder with piston resetting tool, draw off brake fluid from brake fluid reservoir. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.**

- Press piston back.
- Pull protective foil off outer brake pad backplate.
- Fit outer brake pad to brake carrier.
- Insert inner brake pad with retaining spring into brake caliper (piston).

When positioning the brake caliper, ensure that the brake pad does not stick to the brake caliper housing before it is positioned correctly.

Do not damage adhesive surface.



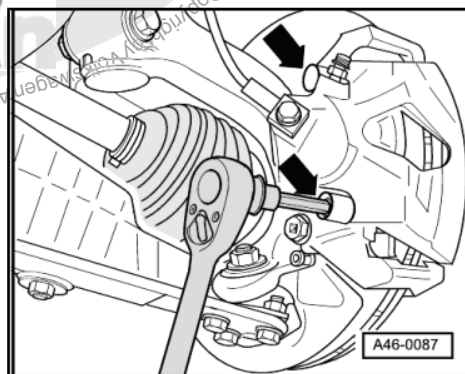
- Bolt brake caliper to brake carrier with both guide pins.
- Fit both cover caps.
- Insert retaining spring into brake caliper.
- Reconnect connector for brake pad wear indicator.
- Fit wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques for fitting wheels .



#### Note

- ◆ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level after changing brake pads.*





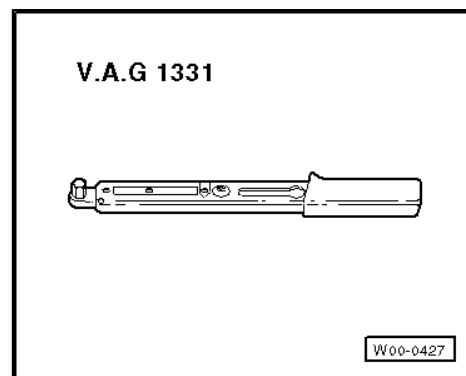
## Specified torques

Component	Specified torque
Guide pin to brake carrier	30 Nm

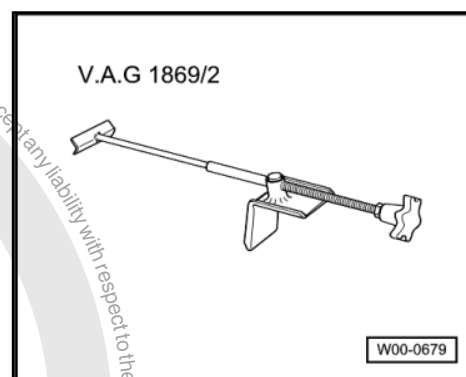
## 2.2 Removing and installing brake caliper, FS III brake caliper

### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



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



### Removing

**This procedure applies only to exchanging or the following repair work on the brake caliper.**

- Remove wheels.
- Lever brake pad retaining spring out from brake caliper with a screwdriver and remove.
- Separate connector for brake pad wear indicator.
- Connect bleeder bottle hose to brake caliper bleeder valve and open bleeder valve.
- Apply brake pedal depressor -V.A.G 1869/2-.
- Close bleeder valve and remove bleeder bottle.
- Disconnect brake hose.
- Pull both caps out of bearing bushes of brake caliper.
- Loosen both guide pins and remove from brake caliper.
- Pull brake caliper off brake carrier.
- Remove brake pads from brake caliper.



## Installing

- Piston is pressed back.
- Outer brake pad is seated on brake carrier.
- Insert inner brake pad with retaining spring into brake caliper (piston).

When positioning the brake caliper, ensure that the brake pad does not stick to the brake caliper housing before it is positioned correctly.

Do not damage adhesive surface.

- Bolt brake caliper to brake carrier with both guide pins.
- Fit both cover caps.
- Bolt brake hose to brake caliper.
- Remove brake pedal depressor -V.A.G 1869/2- .
- Insert retaining spring into brake caliper.
- Reconnect connector for brake pad wear indicator.
- Bleed brake system ➔ [page 131](#) .
- Fit wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques for fitting wheels .



### Note

- ◆ *Firmly depress brake pedal several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level.*

## Specified torques

Component	Specified torque
Guide pin to brake carrier	30 Nm
Brake hose to brake caliper	35 Nm



### 3 Repairing rear brake C 38



#### Note

- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Use the brake filling and bleeding equipment -VAS 5234- or the extraction unit -V.A.G 1869/4- to draw off brake fluid from the brake fluid reservoir.
- ◆ Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor -V.A.G 1869/2- (when doing this, release pressure in system).

#### 1 - ABS speed sensor

- ❑ Before inserting sensor, clean inner surface of fitting hole and coat with hot bolt paste -G 052 112 A3-

#### 2 - Hexagon socket head bolt

- ❑ 8 Nm

#### 3 - Multi-point socket head bolt

- ❑ 90 Nm and turn 90° further
- ❑ Always renew after removing

#### 4 - Wheel bearing housing

#### 5 - Splash plate

#### 6 - Hexagon bolt

- ❑ 9 Nm

#### 7 - Wheel bearing/hub unit

#### 8 - Brake disc

- ❑ Ø 255 mm
- ❑ Thickness: 10 mm
- ❑ Wear limit: 8 mm
- ❑ When worn, renew on both sides of axle.
- ❑ Unscrew brake caliper prior to removing.

#### 9 - Cross-head screw

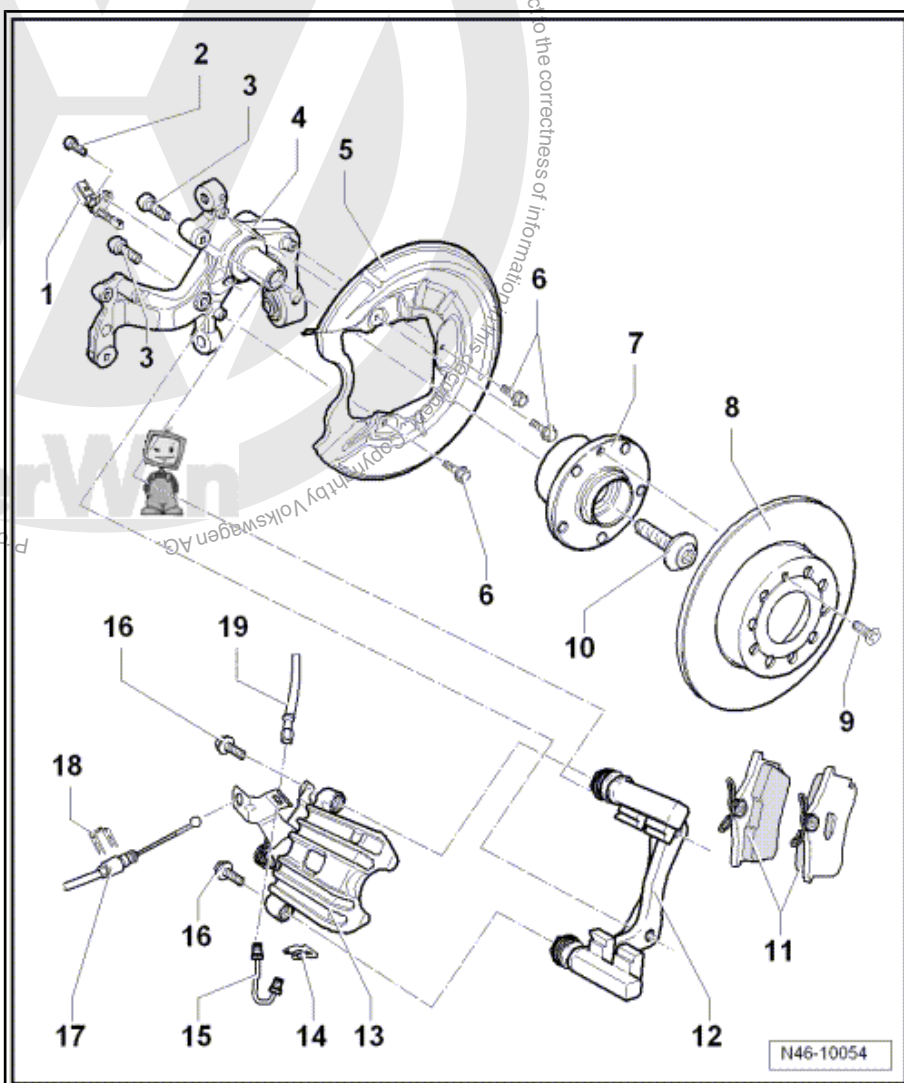
- ❑ 4 Nm

#### 10 - Bolt

- ❑ ⇒ Running gear, axles, steering; Rep. Gr. 42 ; Assembly overview: wheel bearing housing, trailing arm (front-wheel drive)

#### 11 - Brake pads

- ❑ Thickness: 11 mm not including backplate
- ❑ Wear limit: 2 mm not including backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 20.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ [page 76](#) .





## 12 - Brake carrier with guide pin(s) and protective cap

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.

## 13 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 78](#) .
- ☐ Repairing ⇒ [page 121](#)
- ☐ Adjust handbrake cable first after repairing or replacement.
- ☐ Adjusting handbrake ⇒ [page 101](#) .

## 14 - Hose retainer

## 15 - Brake line

- ☐ 14 Nm

## 16 - Hexagon bolt (self-locking)

- ☐ 35 Nm
- ☐ Renew.

## 17 - Handbrake cable

- ☐ Adjusting handbrake ⇒ [page 101](#) .
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

## 18 - Spring clip

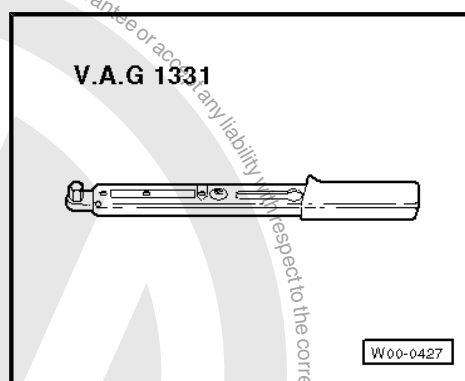
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

## 19 - Brake hose

## 3.1 Removing and installing brake pads for C 38 brake caliper

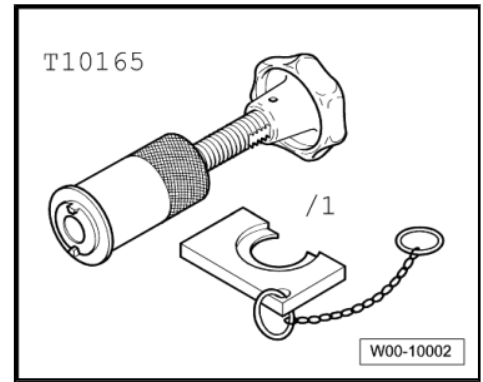
### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-





◆ Resetting and removal tool -T 10165-



### Removing

**Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.**

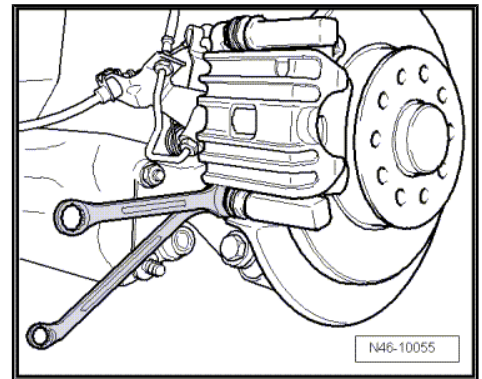
- Remove wheels.
- Remove securing bolts from brake caliper, to do this counter-hold on guide pins.
- Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.
- Remove brake pads.

### Cleaning:



#### WARNING

***Do not blow out brake system with compressed air; the resulting dust constitutes a health hazard!***



- Thoroughly clean brake carrier and contact surfaces for brake pads and remove corrosion.
- Clean brake caliper, particularly the bonding surfaces for the brake pads. These must be free of adhesive and grease residues.

**Use only methylated spirits for cleaning the brake caliper housing.**

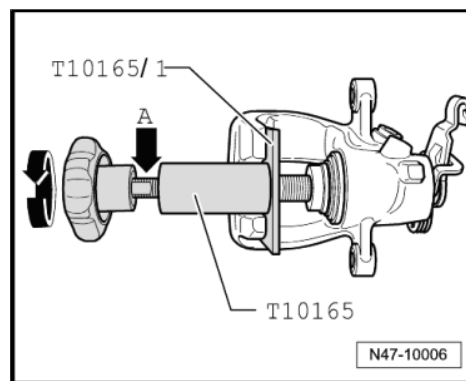
### Installing

**Before pressing pistons back, draw off some brake fluid from reservoir with a bleeder bottle. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.**

- Screw in piston by turning knurled wheel of piston compressing tool - T 10165 - clockwise, do not damage protective cap when doing this.



- To aid screwing in, use special tool T10165/1.
- ◆ If pistons are difficult to move, a 13 mm open-end spanner can be used on intended flats -arrow A-.
- Pull protective foil off backing plates for brake pads.

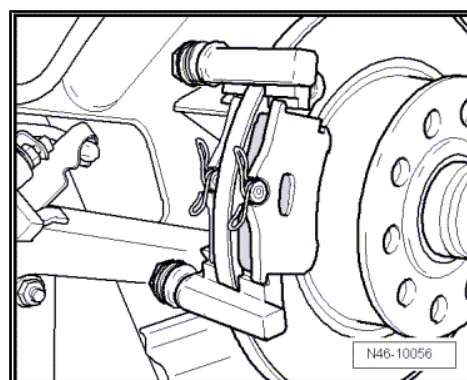


- Insert brake pads into brake carrier.

When positioning the brake caliper, ensure that the brake pads do not stick to the brake caliper before it is positioned correctly.

- Secure brake caliper with new self-locking bolts.
- ◆ The repair kit includes four self-locking hexagon bolts which must always be installed.
- Fit wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts .



#### Note

- ◆ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level after changing brake pads.*

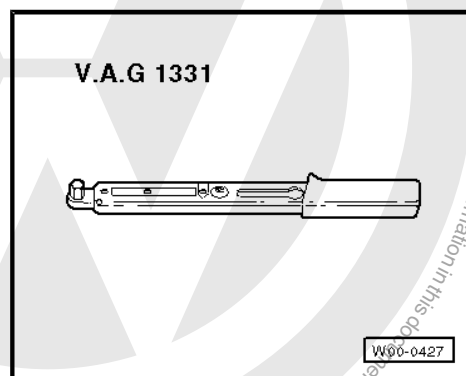
#### Specified torques

Component	Specified torque
Hexagon bolt, brake caliper to brake carrier ◆ Use new bolts!	35 Nm

## 3.2 Removing and installing brake caliper C 38

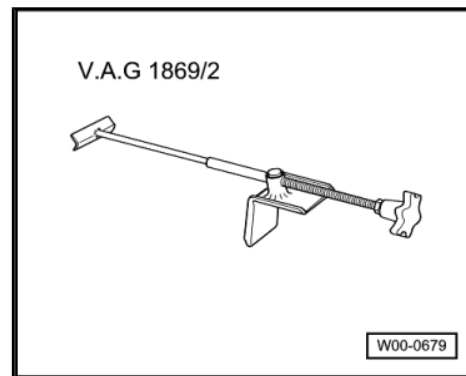
#### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-





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



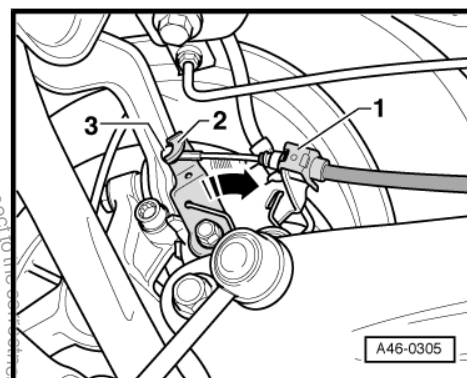
**Removing**

**This procedure applies only to exchanging or the following repair work on the brake caliper.**

- Remove wheels.

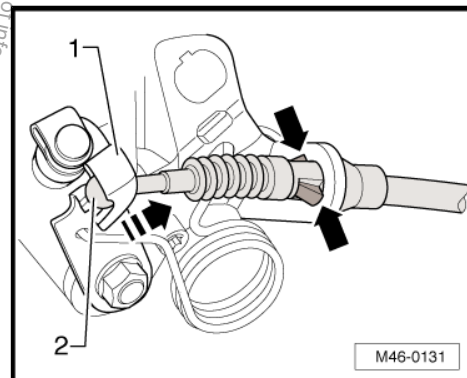
**Vehicles with spring clip on handbrake cable**

- Lever spring clips off -1-.
- Press lever on brake caliper -2- in -direction of arrow- and detach handbrake cable -3-.



**Vehicles with locking lugs on handbrake cable**

- Press locking pins -arrows- inwards.
- Press lever on brake caliper -1- in -direction of arrow- and detach handbrake cable -2-.



**Continuation for all vehicles**

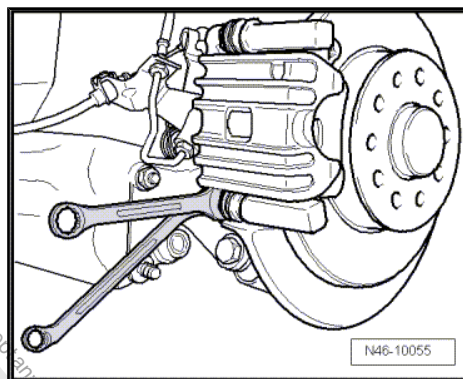
- Connect bleeder bottle hose to brake caliper bleeder valve and open bleeder valve.
- Apply brake pedal depressor -V.A.G 1869/2- .
- Close bleeder valve and remove bleeder bottle
- Unscrew brake line.



- Remove both securing bolts from brake caliper; to do this, counterhold on guide pin.
- Pull brake caliper off brake carrier.

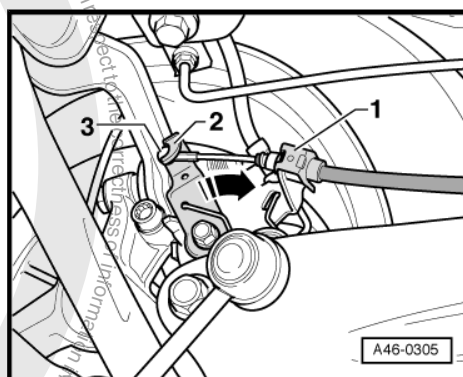
#### Installing

- Piston is pressed back.
- The brake pads are seated on the brake carrier.
- Secure brake caliper to brake carrier with new self-locking bolts.
- Screw brake line to brake caliper.
- Bleed brake system ➔ [page 131](#) .



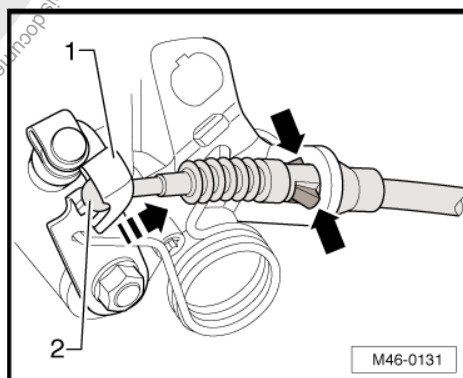
#### Vehicles with spring clip on handbrake cable

- Press lever on brake caliper -2- in -direction of arrow- and attach handbrake cable -3-.
- Press spring clips -1- onto handbrake cable.



#### Vehicles with locking lugs on handbrake cable

- Push handbrake cable into brake caliper bracket so that the locking pins -arrows- engage.
- Press lever on brake caliper -1- in -direction of arrow- and attach handbrake cable -2-.



#### Continuation for all vehicles

- Adjusting handbrake ➔ [page 101](#) .
- Fit wheels.

Specified torque of wheel bolts ➔ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts .



#### Note

- ♦ *Firmly depress brake pedal several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.*
- ♦ *Check brake fluid level.*

#### Specified torques

Component	Specified torque
Hexagon bolt, brake caliper to brake carrier ♦ Use new bolts!	35 Nm
Brake line to brake caliper	14 Nm



## 4 Repairing rear brakes CII 38/CII 41 (front-wheel drive)



### Note

- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Use the brake filling and bleeding equipment -VAS 5234- or the upgrade kit and extraction unit -V.A.G 1869/4- to extract brake fluid from brake fluid reservoir.
- ◆ Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor -V.A.G 1869/2- (when doing this, release pressure in system).

### 1 - ABS speed sensor

- ☐ Before inserting sensor, clean inner surface of fitting hole and coat with hot bolt paste -G 052 112 A3-

### 2 - Hexagon socket head bolt

- ☐ 8 Nm

### 3 - Multi-point socket head bolt

- ☐ 90 Nm and turn 90° further
- ☐ Always renew after removing.

### 4 - Wheel bearing housing

### 5 - Splash plate

### 6 - Hexagon bolt

- ☐ 9 Nm

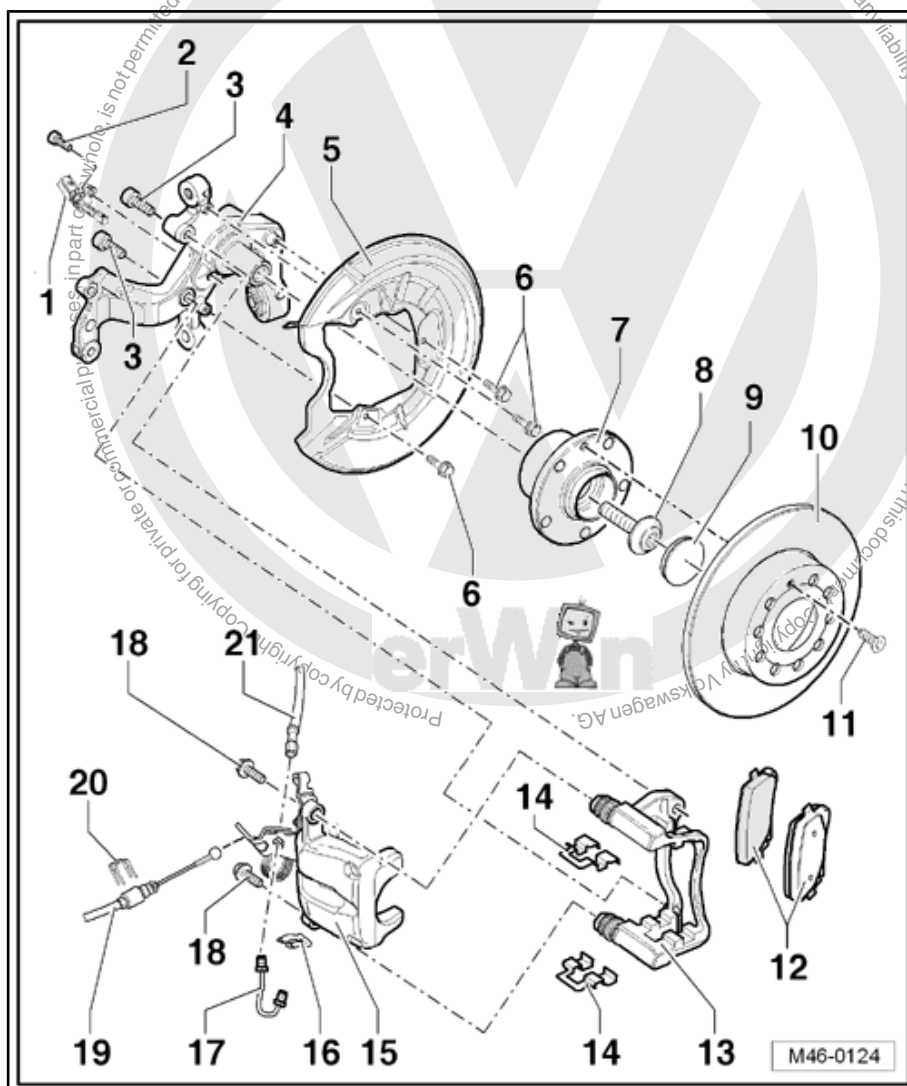
### 7 - Wheel bearing/hub unit

### 8 - Bolt

- ☐ ⇒ Running gear, axles, steering; Rep. Gr. 42 ; Assembly overview: wheel bearing housing, trailing arm (front-wheel drive)

### 9 - Dust cap

- ☐ Pressing off and driving in ⇒ Running gear, axles, steering; Rep. Gr. 42 ; Removing and installing wheel bearing/hub unit



### 10 - Brake disc

- ☐ Brake caliper CII 38: Ø 286 mm
- ☐ Brake caliper CII 41 (15"): Ø 260 mm
- ☐ Brake caliper CII 41 (16"): Ø 286 mm
- ☐ Thickness: 12 mm
- ☐ Wear limit: 10 mm
- ☐ When worn, renew on both sides of axle.
- ☐ Unscrew brake caliper prior to removing.



- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

#### 11 - Bolt

- ☐ 4 Nm

#### 12 - Brake pads

- ☐ Thickness: 11 mm not including backplate
- ☐ Wear limit: 2 mm not including backplate
- ☐ Check thickness ⇒ Maintenance ; Booklet 20.1 .
- ☐ Always renew on both sides of an axle.
- ☐ Removing and installing ⇒ [page 82](#) .

#### 13 - Brake carrier with guide pin(s) and protective cap

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

#### 14 - Pad retainer

- ☐ Always renew when changing pads.

#### 15 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 85](#) .
- ☐ Repairing ⇒ [page 121](#)
- ☐ Adjust handbrake cable first after repairing or renewing.
- ☐ Adjusting handbrake ⇒ [page 101](#) .

#### 16 - Hose retainer

#### 17 - Brake line

- ☐ 14 Nm

#### 18 - Hexagon bolt

- ☐ 35 Nm
- ☐ Self-locking
- ☐ Renew.

#### 19 - Handbrake cable

- ☐ Adjusting handbrake ⇒ [page 101](#) .
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

#### 20 - Spring clip

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

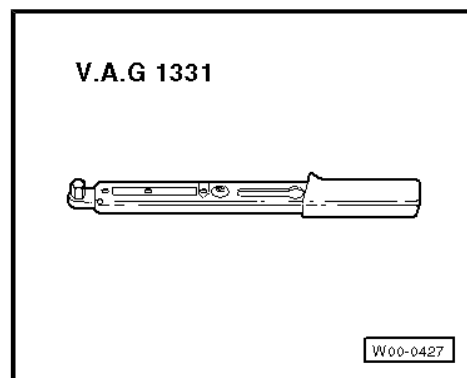
#### 21 - Brake hose

### 4.1 Removing and installing brake pads for C 38 brake caliper

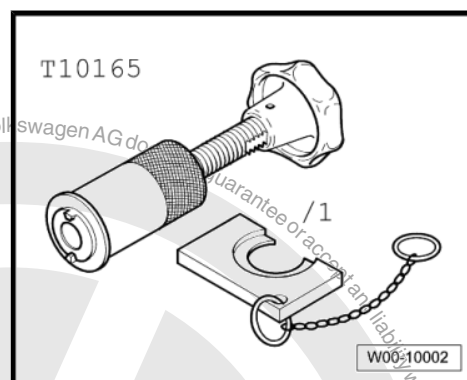
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



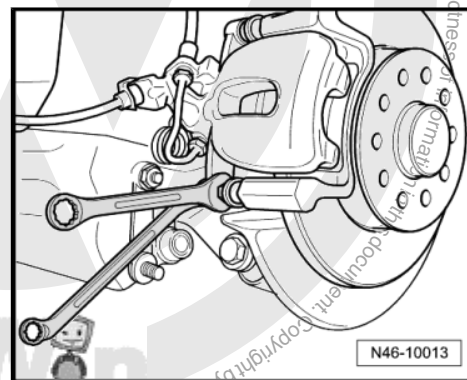
- ◆ Piston compressing tool -T10165-



## Removing

**Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.**

- Remove wheels.
- Remove securing bolts from brake caliper, to do this counter-hold on guide pins.
- Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.





- Remove brake pads and pad retainers -arrows-.

#### Cleaning:



#### WARNING

*Do not blow out brake system with compressed air; the resulting dust constitutes a health hazard!*

- Thoroughly clean contact surfaces for pad retainers (brake pads) on brake carrier, and remove corrosion.
- Clean brake caliper.

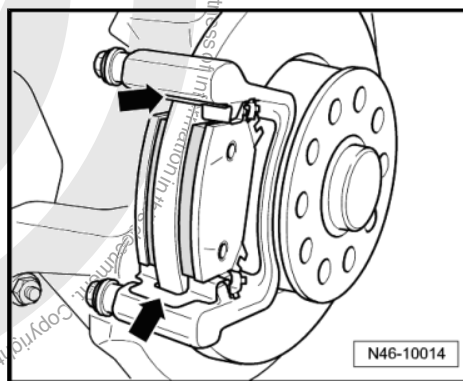
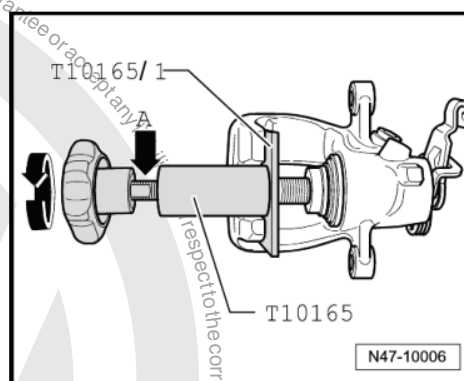
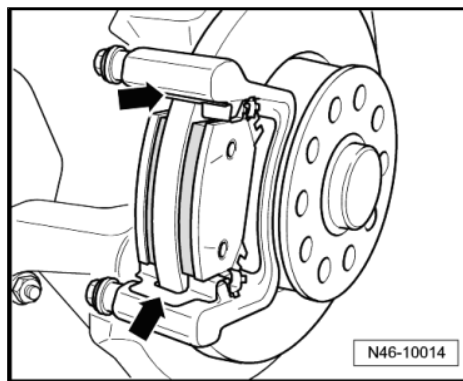
Use only methylated spirits for cleaning the brake caliper housing.

#### Installing

Before pressing pistons back, draw off some brake fluid from reservoir with a bleeder bottle. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.

- Screw in piston by turning knurled wheel of piston compressing tool -T10165- clockwise, do not damage protective cap when doing so.
- To aid screwing in, use plate -T10165/1- .
- ♦ If pistons are difficult to move, a 13 mm open-end spanner can be used on intended flats -arrow A-.

- Insert pad retainers -arrows- and brake pads into brake carrier.





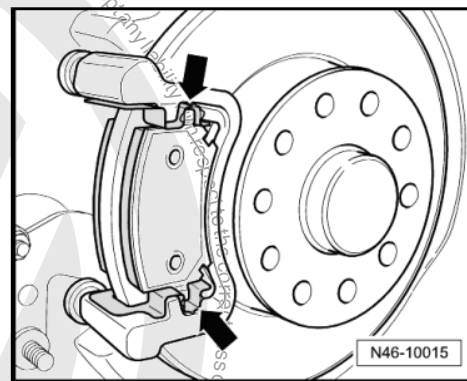
- Ensure that brake pads are seated correctly in pad retainers -arrows-.
- Secure brake caliper with new self-locking bolts.
- ◆ The repair kit includes four self-locking hexagon bolts which must always be installed.
- Fit wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44; Specified torques for fitting wheels .



#### Note

- ◆ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level after changing brake pads.*



#### Specified torques

Component	Specified torque
Brake caliper to brake carrier ◆ Use new bolts!	35 Nm

## 4.2 Removing and installing brake caliper CII 38/CII 41

#### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

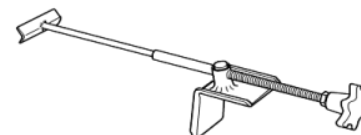
V.A.G 1331



W00-0427

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

V.A.G 1869/2



W00-0679



## Removing

This procedure applies only to exchanging or the following repair work on the brake caliper.

- Remove wheel.

### Vehicles with spring clip on handbrake cable

- Lever spring clips off -1-.
- Press lever on brake caliper -2- in -direction of arrow- and detach handbrake cable -3-.

### Vehicles with locking lugs on handbrake cable

- Press locking pins -arrows- inwards.
- Press lever on brake caliper -1- in -direction of arrow- and detach handbrake cable -2-.

### Continuation for all vehicles

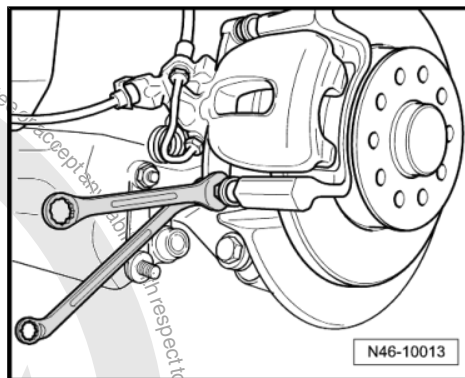
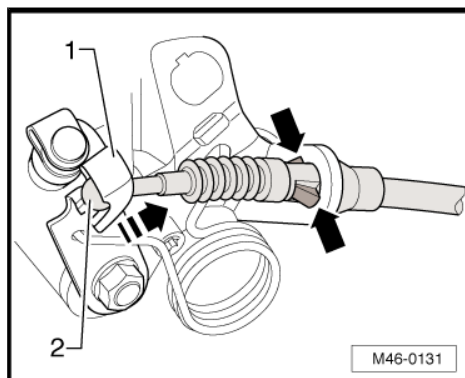
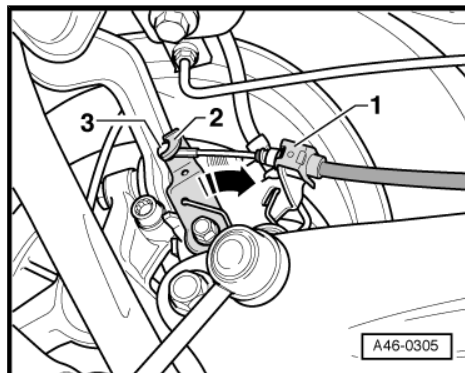
- Connect bleeder bottle hose to brake caliper bleeder valve and open bleeder valve.
- Apply brake pedal depressor -V.A.G 1869/2- .
- Close bleeder valve and remove bleeder bottle.
- Unscrew brake line.

- Remove both securing bolts from brake caliper, to do this, counterhold on guide pin.
- Pull brake caliper off brake carrier.

## Installing

- Piston is pressed back.
- The brake pads are seated in the retaining springs on the brake carrier.
- Secure brake caliper to brake carrier with new self-locking bolts.
- Screw brake line to brake caliper.
- Bleed brake system ➔ [page 131](#) .

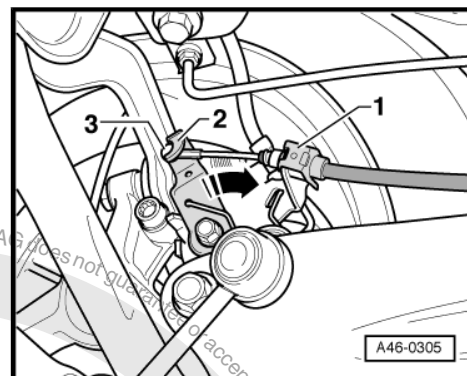
### Vehicles with spring clip on handbrake cable





- Press lever on brake caliper -2- in -direction of arrow- and attach handbrake cable -3-.
- Press spring clips -1- onto handbrake cable.

#### Vehicles with locking lugs on handbrake cable

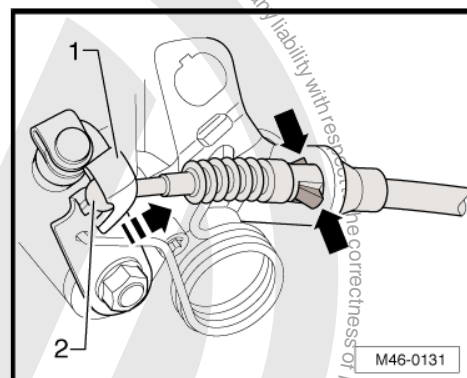


- Push handbrake cable into brake caliper bracket so that the locking pins -arrows- engage.
- Press lever on brake caliper -1- in -direction of arrow- and attach handbrake cable -2-.

#### Continuation for all vehicles

- Adjust handbrake ➔ [page 101](#) .
- Fit wheel.

Specified torque of wheel bolts ➔ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques for fitting wheels .



#### Note

- ◆ *Firmly depress brake pedal several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level.*

#### Specified torques

Component	Specified torque
Hexagon bolt, brake caliper to brake carrier ◆ Use new bolts!	35 Nm
Brake line to brake caliper	14 Nm



## 5 Repairing rear brake CII 41 (four-wheel drive)



### Note

- ◆ Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.
- ◆ Use the brake filling and bleeding equipment -VAS 5234- or the extraction unit -V.A.G 1869/4- to draw off brake fluid from the brake fluid reservoir.
- ◆ Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor -V.A.G 1869/2- (when doing this, release pressure in system).

### 1 - Multi-point socket head bolt

- ☐ 90 Nm and turn 90° further
- ☐ Always renew after removing.

### 2 - ABS speed sensor

- ☐ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.

### 3 - Hexagon socket head bolt

- ☐ 8 Nm

### 4 - Wheel bearing housing

### 5 - Splash plate

### 6 - Bolt

- ☐ M6 x 12
- ☐ 12 Nm

### 7 - Wheel bearing/hub unit

### 8 - Brake disc

- ☐ Ø 15 inch: 260 mm
- ☐ Thickness 15 inch: 12 mm,
- ☐ Wear limit 15 inch: 10 mm
- ☐ When worn, renew on both sides of axle.
- ☐ Unscrew brake caliper prior to removing.

### 9 - Bolt

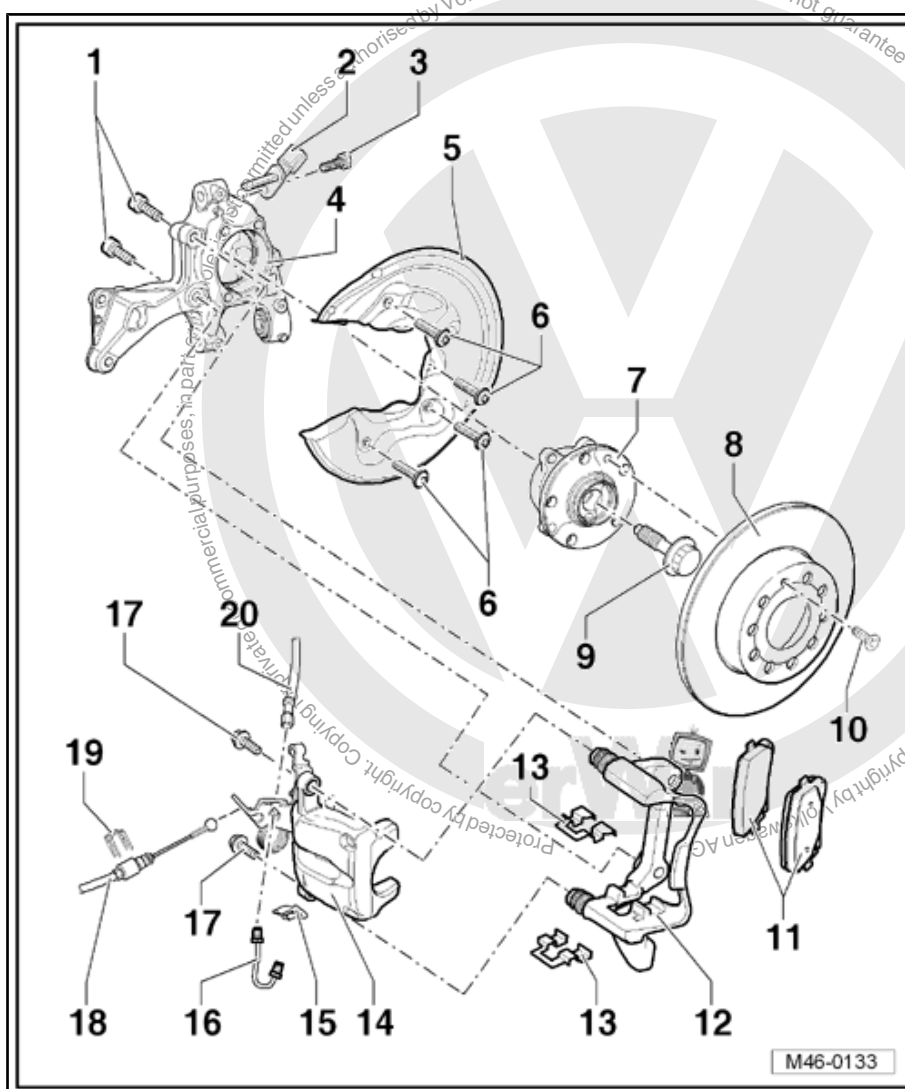
- ☐ ⇒ Running gear, axles, steering; Rep. Gr. 42 ; Assembly overview: drive shaft

### 10 - Cross-head screw

- ☐ 4 Nm

### 11 - Brake pads

- ☐ Thickness: 11 mm not including backplate
- ☐ Wear limit: 2 mm not including backplate
- ☐ Check thickness ⇒ Maintenance ; Booklet 20.1 .
- ☐ Always renew on both sides of an axle.





- ☐ Removing and installing ⇒ [page 89](#) .

## 12 - Brake carrier with different guide pins and protective cap

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.
- ☐ Installation instructions ⇒ [page 89](#)

## 13 - Pad retainer

- ☐ Always renew when changing pads.

## 14 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 92](#) .
- ☐ Repairing ⇒ [page 121](#)
- ☐ Adjust handbrake cable first after repairing or replacement.
- ☐ Adjusting handbrake ⇒ [page 101](#) .

## 15 - Hose retainer

## 16 - Brake line

- ☐ 14 Nm

## 17 - Hexagon bolt

- ☐ 35 Nm
- ☐ Self-locking
- ☐ Always renew after removing.

## 18 - Handbrake cable

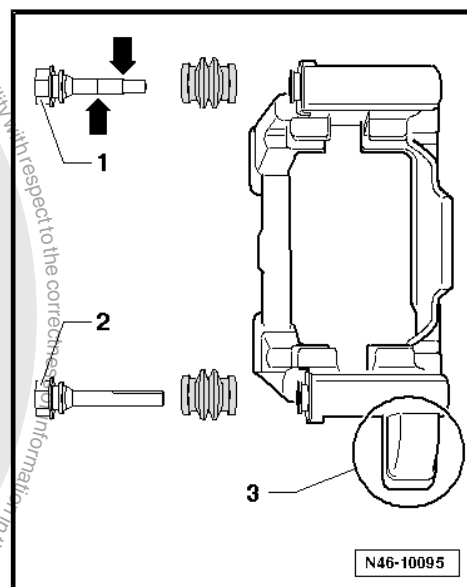
- ☐ Adjusting handbrake ⇒ [page 101](#) .
- ☐ Removing and installing ⇒ [page 103](#) .

## 19 - Spring clip

## 20 - Brake hose

### Installation instructions for brake carrier:

- 1 - Shorter guide pin with steps -arrows-, leading side
- 2 - Longer guide pins, phasing out
- 3 - Balance weight, phasing out

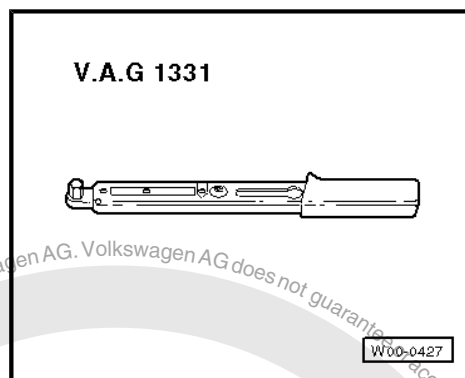


## 5.1 Removing and installing brake pads/linings

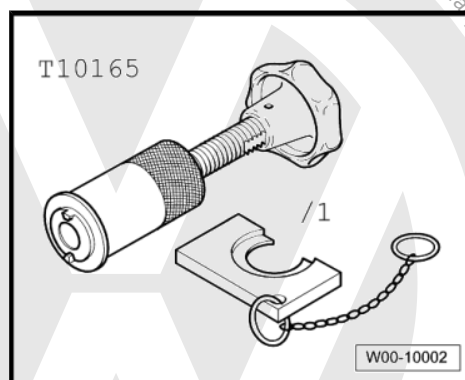
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



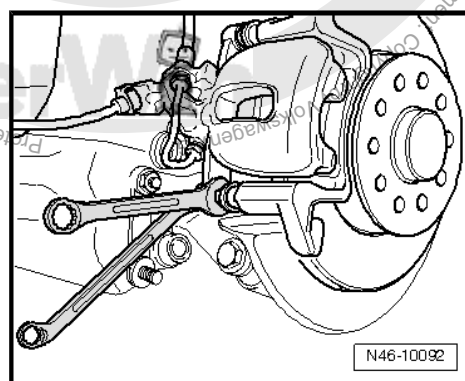
- ◆ Resetting and removal tool -T 10165-



## Removing

**Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.**

- Remove wheels.
- Remove securing bolts from brake caliper, to do this counter-hold on guide pins.
- Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.





- Remove brake pads and pad retainers -arrows-.

#### Cleaning:



#### WARNING

***Do not blow out brake system with compressed air; the resulting dust constitutes a health hazard!***

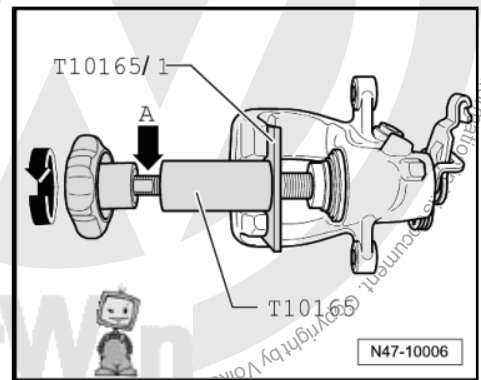
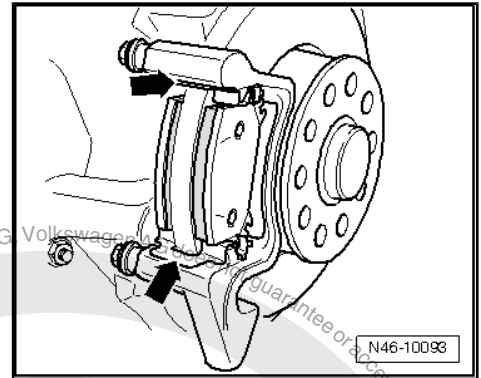
- Thoroughly clean contact surfaces for pad retainers (brake pads) on brake carrier, and remove corrosion.
- Clean brake caliper.

**Use only methylated spirits for cleaning the brake caliper housing.**

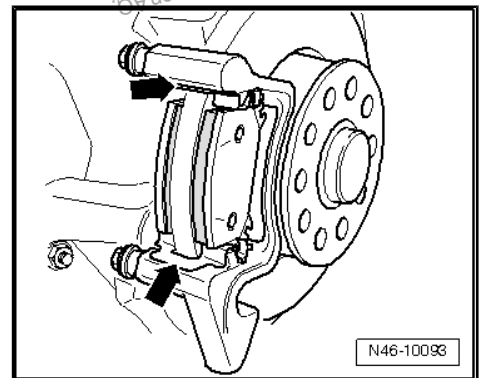
#### Installing

**Before pressing pistons back, draw off some brake fluid from reservoir with a bleeder bottle. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.**

- Screw in piston by turning knurled wheel of piston compressing tool - T 10165 - clockwise, do not damage protective cap when doing this.
- To aid screwing in, use special tool T 10165/1.
- ♦ If pistons are difficult to move, a 13 mm open-end spanner can be used on intended flats -arrow A-.



- Insert pad retainers -arrows- and brake pads into brake carrier.





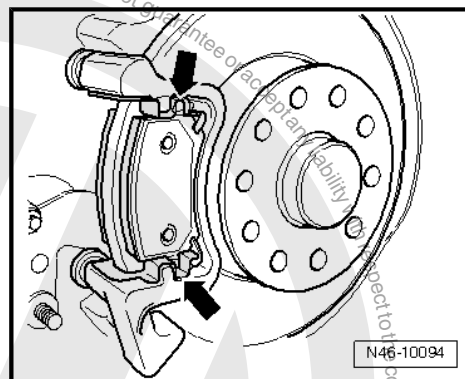
- Ensure that brake pads are seated correctly in pad retainers -arrows-.
- Secure brake caliper with new self-locking bolts.
- ◆ The repair kit includes four self-locking hexagon bolts which must always be installed.
- Fit wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts .



#### Note

- ◆ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level after changing brake pads.*



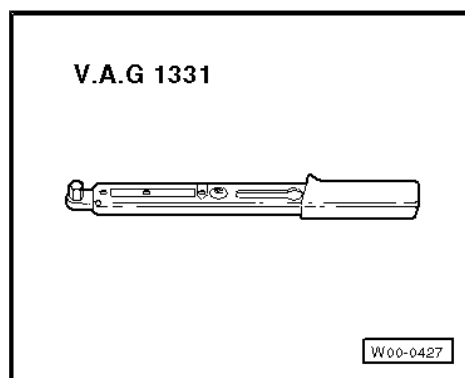
#### Specified torques

Component	Specified torque
Hexagon bolt, brake caliper to brake carrier ◆ Use new bolts!	35 Nm

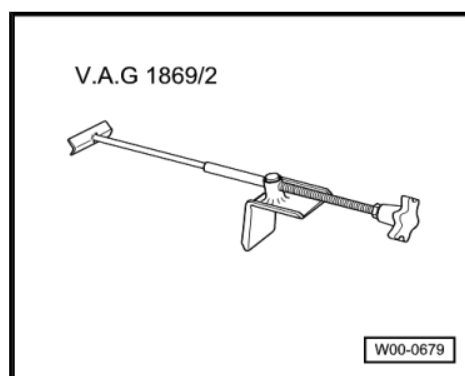
## 5.2 Removing and installing brake caliper

### Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



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

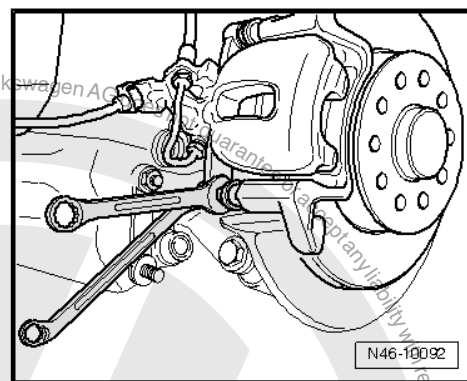




## Removing

This procedure applies only to exchanging or the following repair work on the brake caliper.

- Remove wheels.
- Unclip brake cable from lever on brake caliper.
- Pull spring clip downwards and pull handbrake cable out of retainer on brake caliper.
- Connect bleeder bottle hose to brake caliper bleeder valve and open bleeder valve.
- Apply brake pedal depressor -V.A.G 1869/2- .
- Close bleeder valve and remove bleeder bottle.
- Unscrew brake line.
- Remove both securing bolts from brake caliper; to do this, counterhold on guide pin.
- Pull brake caliper off brake carrier.



## Installing

- Piston is pressed back.
- The brake pads are seated in the retaining springs on the brake carrier.
- Secure brake caliper to brake carrier with new self-locking bolts.
- Screw brake line to brake caliper.
- Bleed brake system ➔ [page 131](#) .
- Hook in handbrake cable and secure on retainer with spring clip.
- Adjusting handbrake ➔ [page 101](#) .
- Fit wheels.

Specified torque of wheel bolts : Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts .



### Note

- ◆ *Firmly depress brake pedal several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level.*

## Specified torques

Component	Specified torque
Hexagon bolt, brake caliper to brake carrier ◆ Use new bolts!	35 Nm
Brake line to brake caliper	14 Nm



## 6 Repairing rear brakes, Bosch



### Note

- ◆ Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.
- ◆ After work for which the brake system had to be opened, bleed the brake system with brake charge and bleed system -VAS 5234- or extraction unit -V.A.G 1869/4-.
- ◆ Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor -V.A.G 1869/2- (when doing this, release pressure in system).

### 1 - ABS speed sensor

- ❑ Before inserting sensor, clean inner surface of hole and coat with high-temperature paste -G 052 112 A3-.

### 2 - Bolt

- ❑ 8 Nm.

### 3 - Bolt

- ❑ 90 Nm and turn 90° further.
- ❑ Always renew after removing

### 4 - Wheel bearing housing

### 5 - Splash plate

### 6 - Bolt

- ❑ 12 Nm.
- ❑ M6 x 12

### 7 - Wheel hub with wheel bearing

- ❑ Different for front- and four-wheel drive.
- ❑ Allocation ⇒ Electronic parts catalogue "ETKA"
- ❑ ⇒ Running gear, axles, steering; Rep. Gr. 42 ; Repairing rear wheel suspension, drive shaft

### 8 - Bolt

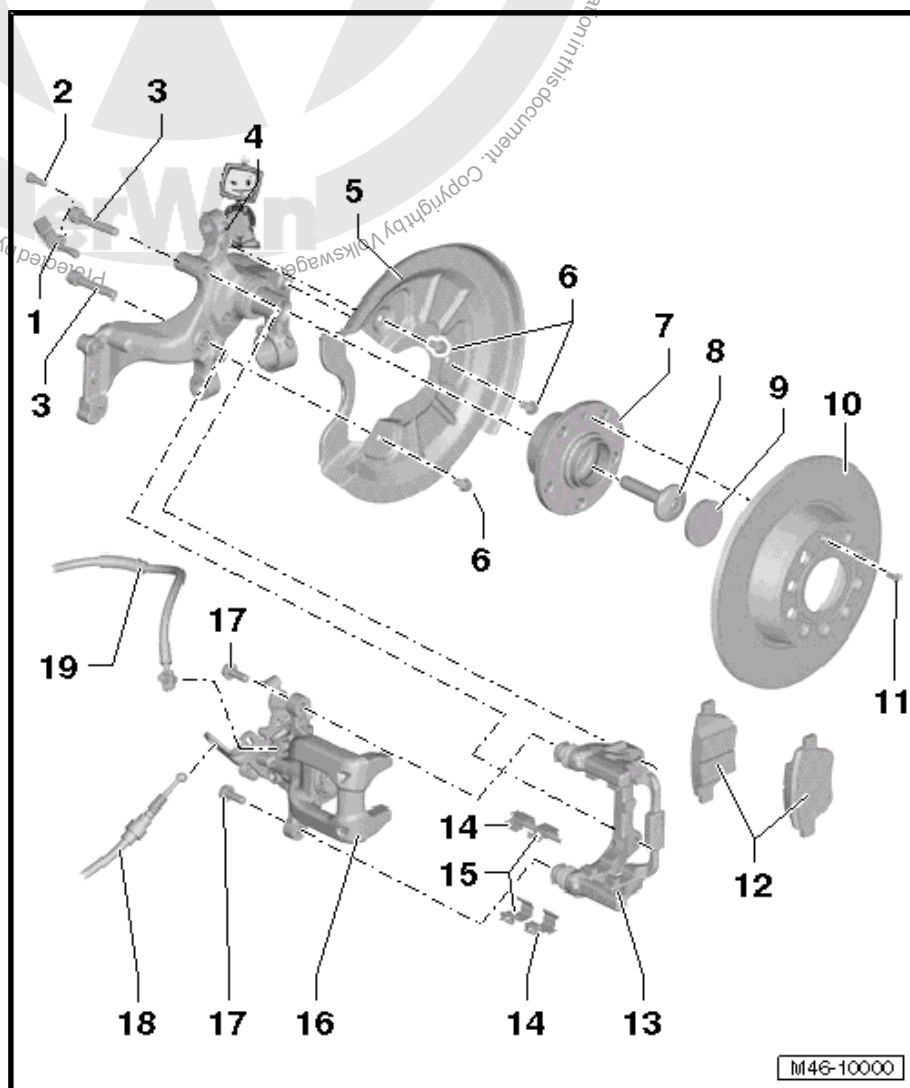
- ❑ Different for front- and four-wheel drive.
- ❑ Allocation ⇒ Electronic parts catalogue "ETKA"
- ❑ ⇒ Running gear, axles, steering; Rep. Gr. 42 ; Repairing rear wheel suspension, drive shaft

### 9 - Dust cap

- ❑ Front-wheel drive only

### 10 - Brake disc

- ❑ Ø 272 mm
- ❑ Thickness: 10 mm
- ❑ Wear limit: 8 mm





- ☐ When worn, renew on both sides of axle.
- ☐ Unscrew brake caliper prior to removing.

#### 11 - Bolt

- ☐ 4 Nm.
- ☐ For locating brake disc.

#### 12 - Brake pads

- ☐ Thickness: 12 mm not including backplate
- ☐ Wear limit: 2 mm not including backplate
- ☐ Checking thickness: Maintenance Booklet ⇒ Maintenance ; Booklet ; Front and rear brake pads/linings: Checking thickness .
- ☐ Always replace on both sides
- ☐ Removing and installing ⇒ [page 95](#)

#### 13 - Brake carrier with different guide pins and protective caps

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.

#### 14 - Pad retainer

- ☐ Always renew when changing pads.

#### 15 - Pad retainer

- ☐ Always renew when changing pads.

#### 16 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 98](#)
- ☐ Repairing ⇒ [page 126](#)
- ☐ Adjust handbrake cable first after repairing or renewing.
- ☐ Adjusting handbrake ⇒ [page 102](#)

#### 17 - Bolt

- ☐ 35 Nm.
- ☐ Self-locking
- ☐ Always renew after removing.

#### 18 - Handbrake cable

- ☐ Both locking lugs must be engaged on brake caliper bracket.
- ☐ Adjusting handbrake ⇒ [page 102](#) .

#### 19 - Brake hose

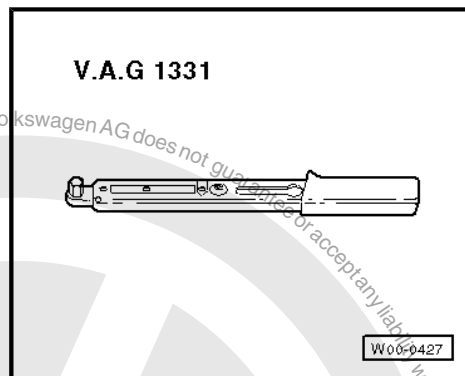
- ☐ With banjo bolt and seals
- ☐ 35 Nm.

## 6.1 Removing and installing brake pads/linings

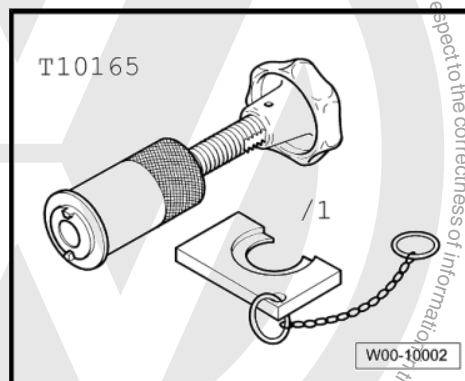
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



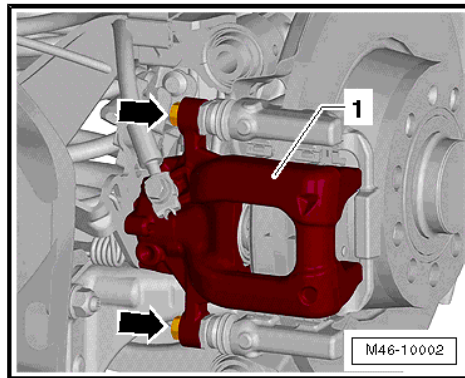
- ◆ Piston compressing tool -T10165-



## Removing

Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.

- Raise vehicle.
- Remove rear wheels.
- Unscrew bolts -arrows- from brake caliper -1-; to do this counterhold on guide pin.
- Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.





- Remove brake pads and pad retainers -arrows-.

#### Cleaning:



#### WARNING

**Do not blow out brake system with compressed air; the resulting dust constitutes a health hazard!**

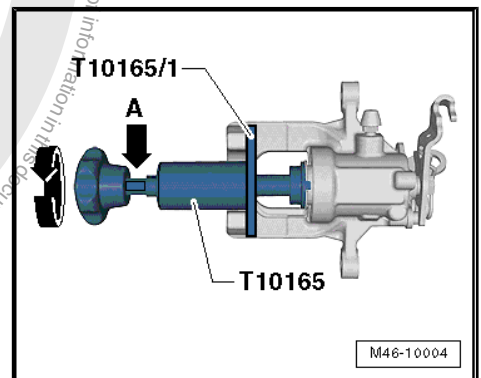
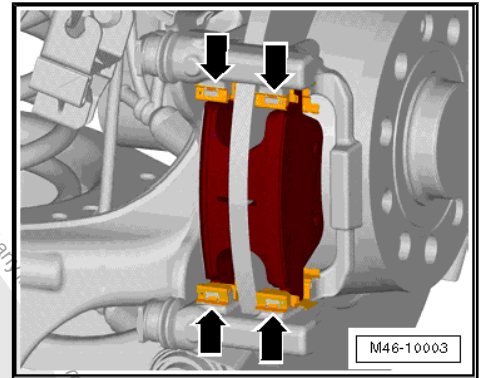
- Thoroughly clean contact surfaces for anti-rattle springs (brake pads) on brake carrier, and remove corrosion.
- Clean brake caliper.

**Use only methylated spirits for cleaning the brake caliper housing.**

#### Installing

**Before pressing pistons back, draw off some brake fluid from reservoir with a bleeder bottle. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.**

- Screw in piston by turning thumb wheel on piston compressing tool -T10165- clockwise. Do not damage protective cap.
- Use plate -T10165/1- for assistance when screwing in.
- ♦ If pistons are difficult to move, a 13 mm open-end spanner can be used on intended flats -arrow A-.



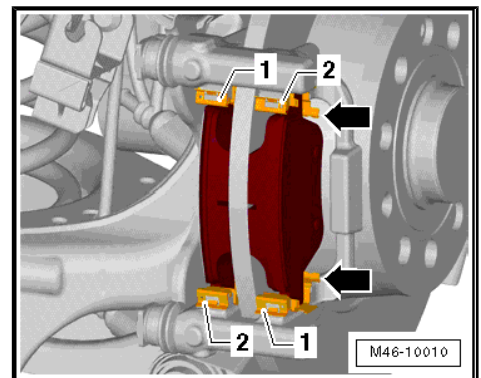
- Insert anti-rattle springs -1- and -2- into brake carrier.



#### Note

*Anti-rattle springs -1- and -2- are different. They can only be installed diagonally to each other.*

- Insert anti-rattle springs -1- and -2- so that guide lugs -arrows- on both sides of brake carrier point outwards.
- Insert brake pads into brake carrier.





- Ensure that brake pads are seated correctly in anti-rattle springs -arrows-.
- Secure brake caliper with new self-locking bolts.
- Fit wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts .



#### Note

- ♦ *Repair kit contains 4 self-locking hexagon bolts for securing brake caliper. These must be installed under all circumstances.*
- ♦ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.*
- ♦ *Check brake fluid level after changing brake pads.*

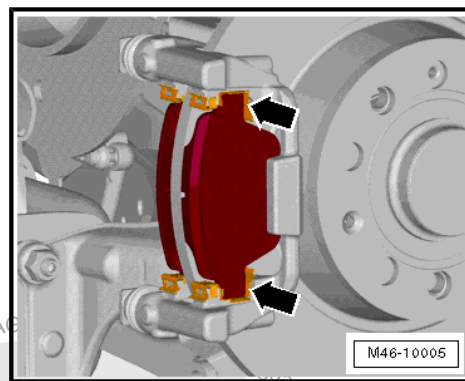
#### Specified torque:

Hexagon bolt, brake caliper to brake carrier	35 Nm.
--	--------

## 6.2 Removing and installing brake caliper

### Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-



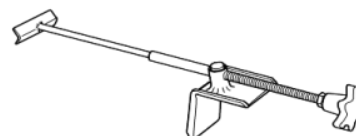
V.A.G 1331



W00-0427

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

V.A.G 1869/2



W00-0679

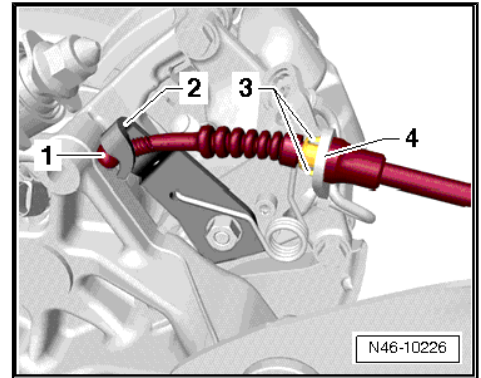
### Removing

This procedure applies only to exchanging or the following repair work on the brake caliper.

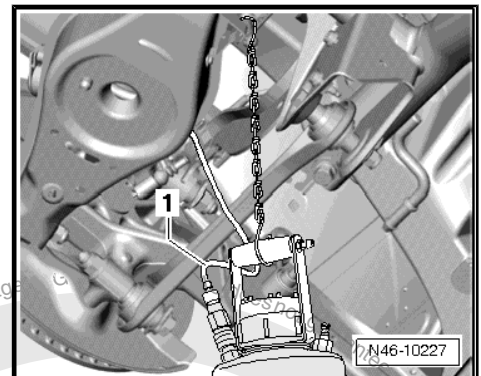
- Raise vehicle.
- Remove rear wheels.



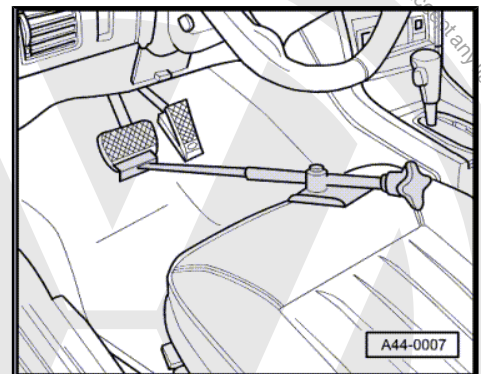
- Unhook handbrake cable -1- from lever on brake caliper -2-.
- Press locking lugs -3- together and remove handbrake cable from bracket -4- on brake caliper.



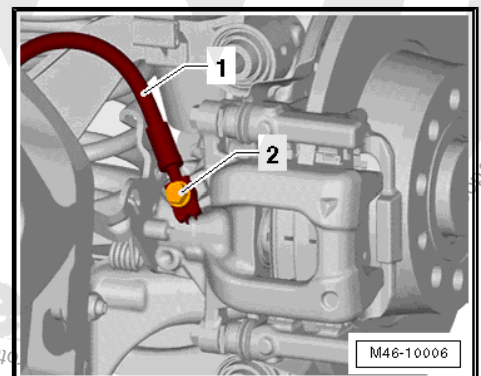
- Connect bleed bottle bleed hose -1- to brake caliper bleed valve and open bleed valve.



- Apply brake pedal depressor -V.A.G 1869/2-
- Close bleed valve and remove bleed bottle



- Release brake hose -1- connection with banjo bolt -2- on brake caliper.

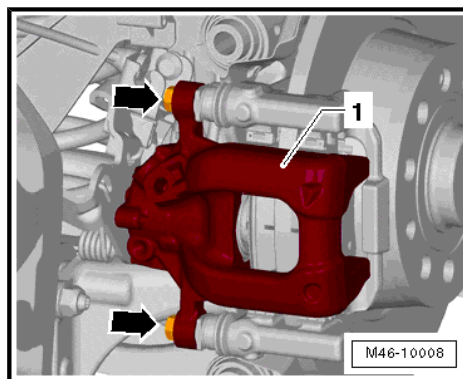




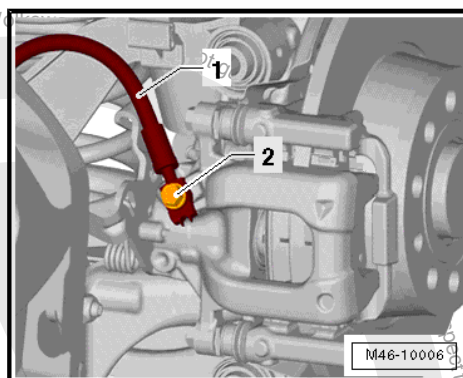
- Unscrew bolts -arrows- from brake caliper -1-; to do this counterhold on guide pin.
- Pull brake caliper from brake carrier.

### Installing

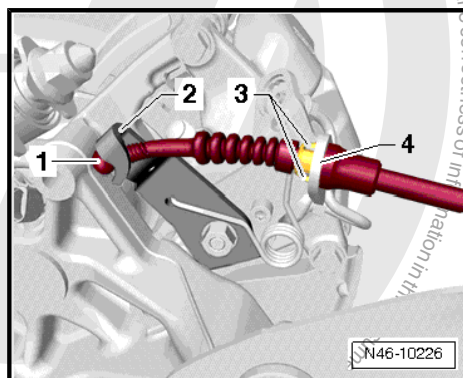
- Piston is pressed back.
- The brake pads are seated in the retaining springs on the brake carrier.
- Secure brake caliper to brake carrier with new self-locking bolts.



- Screw brake hose -1- with banjo bolt -2- on brake caliper.



- Guide handbrake cable through bracket -4- on brake caliper until locking lugs -3- engage.
- Attach handbrake cable -1- to lever -2- on brake caliper.
- Bleed brake system ⇒ [page 131](#) .
- Adjust handbrake ⇒ [page 102](#)
- Fit wheels.



Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques of wheel bolts .



### Note

- ◆ *Firmly depress brake pedal several times with vehicle stationary so that the brake pads are properly seated in their normal operating position.*
- ◆ *Check brake fluid level.*

### Specified torques:

Hexagon bolt, brake caliper to brake carrier	35 Nm.
◆ Use new bolts!	

Brake hose with banjo bolt to brake caliper	35 Nm.
---	--------



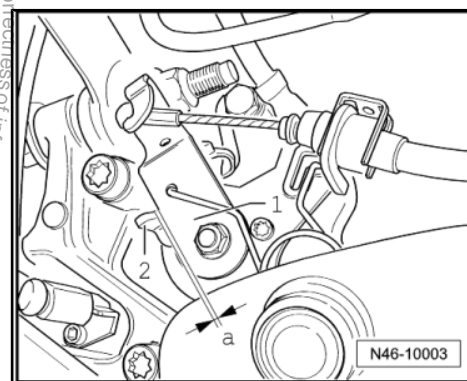
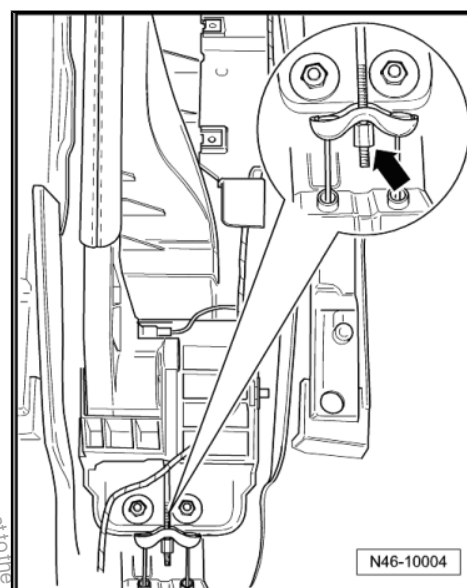
## 7 Adjusting handbrake up to week 50/2009

A new adjustment is only necessary after renewing, handbrake cables, brake calipers and brake discs.

- Depending on equipment version of centre console, remove only cup holder, rear cover or complete centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .
- Depress brake pedal forcefully at least three times.
- Pull handbrake on three times and then release again.

Below the first notch, the handbrake lever must return to its released position.

- Handbrake lever in rest position.
- Tighten adjusting nut -arrow (enlargement)- ...



- ... until lever -1- at brake calipers lift off stop (projection) -2-.
- The total distance -a- to stops -2- on left and right brake calipers must not be  $\leq 1.5$  mm.
- Check that both wheels turn freely.

Due to the automatic rear wheel brake adjustment there is no requirement to adjust the handbrake after making new/initial adjustment.



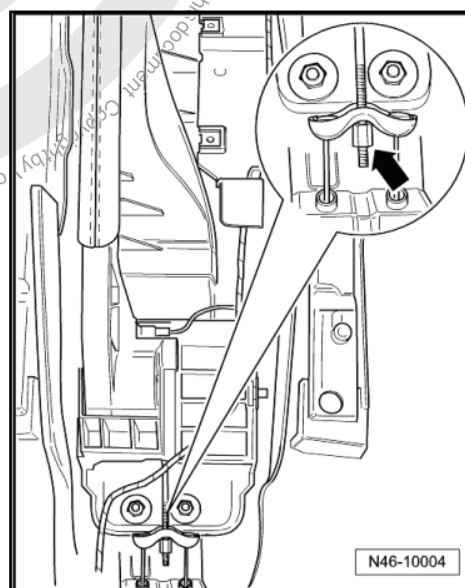
## 8 Adjusting handbrake as of week 50/2009

A new adjustment is only necessary after renewing, handbrake cables, brake calipers and brake discs.

- Depending on equipment version of centre console, remove only cup holder, rear cover or complete centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .
- Depress brake pedal forcefully at least three times.
- Pull handbrake on three times and then release again.

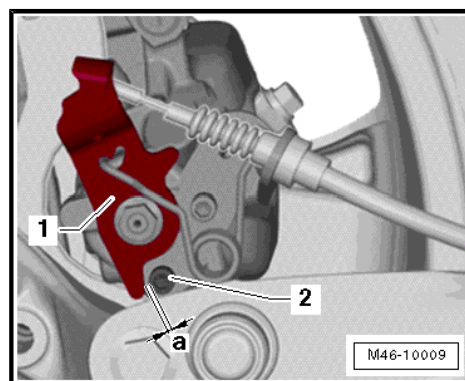
Below the first notch, the handbrake lever must return to its released position.

- Handbrake lever in rest position.
- Tighten adjusting nut -arrow (enlargement)- ...



- ... until lever -1- at brake calipers lift off stop (projection) -2-.
- The total distance -a- between lever -1- and stops -2- on left and right brake calipers must be  $\leq 1.5$  mm.
- Check that both wheels turn freely.

Due to the automatic rear wheel brake adjustment there is no requirement to adjust the handbrake after making new/initial adjustment.





## 9 Assembly overview - handbrake lever

### 1 - Handbrake lever

- ☐ Before removing take out centre console.

### 2 - Hexagon nut

- ☐ 20 Nm

### 3 - Handbrake lever trim

- ☐ Pull off forwards.
- ☐ Lever up release tab in rear, lower area of handle -arrow- with a screw-driver.
- ☐ If leather upholstery is fitted, leather is cut in area of locking mechanism.

### 4 - Pull rod

### 5 - Compensator

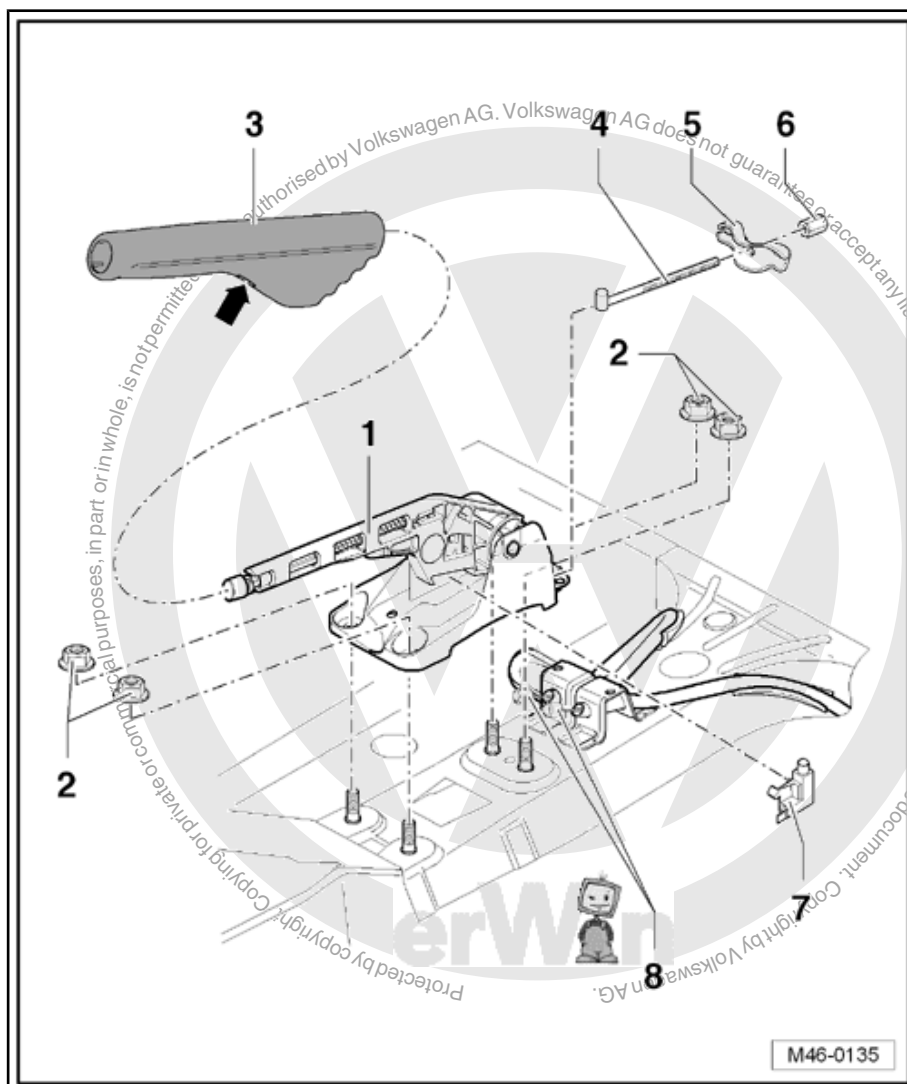
### 6 - Adjustment nut

- ☐ Adjusting handbrake  
⇒ [page 101](#) .

### 7 - Handbrake warning switch

### 8 - Handbrake cables

- ☐ Removing and installing up to model year 2007  
⇒ [page 103](#)
- ☐ Removing and installing from model year 2008  
⇒ [page 106](#)



### 9.1 Removing and installing handbrake cable up to model year 2007

#### Removing

- Release handbrake
- Remove centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .



- Release adjustment nut -1- until relevant handbrake cable -2- can be detached from compensator -3-.

#### Vehicles with spring clip on handbrake cable

- Lever spring clips off -1-.
- Press lever on brake caliper -2- in -direction of arrow- and detach handbrake cable -3-.

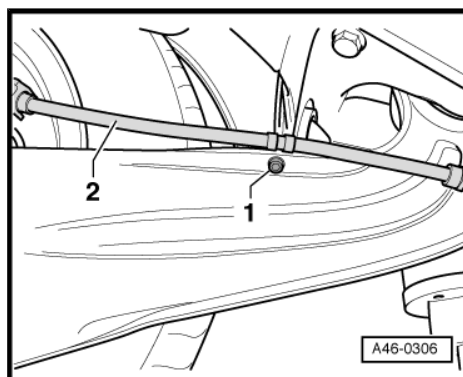
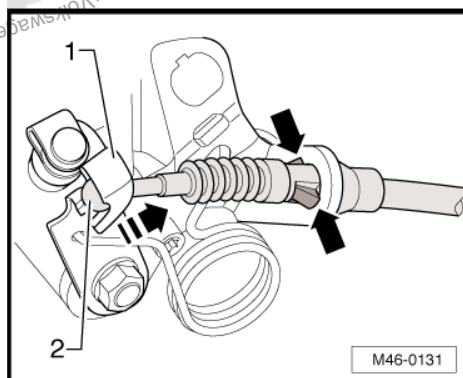
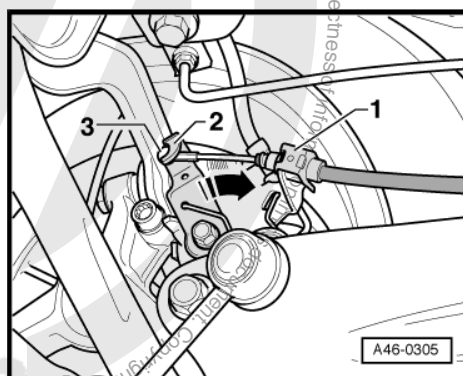
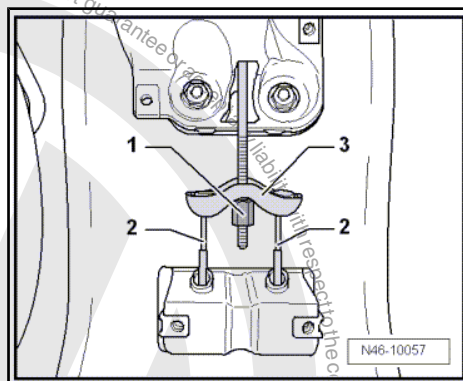
#### Vehicles with locking lugs on handbrake cable

- Press locking pins -arrows- inwards.
- Press lever on brake caliper -1- in -direction of arrow- and detach handbrake cable -2-.

#### Continuation for all vehicles

- Unscrew Torx bolt -1- and then release fastening clip from handbrake cable -2-.

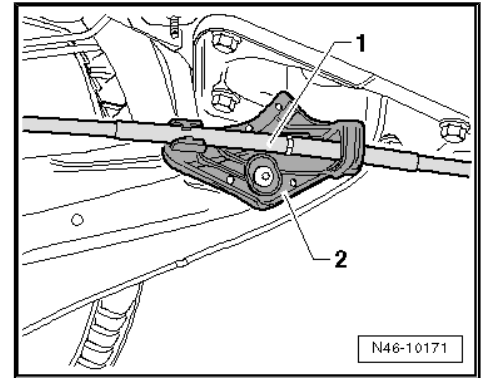
#### Vehicles with retainer for hand brake cable





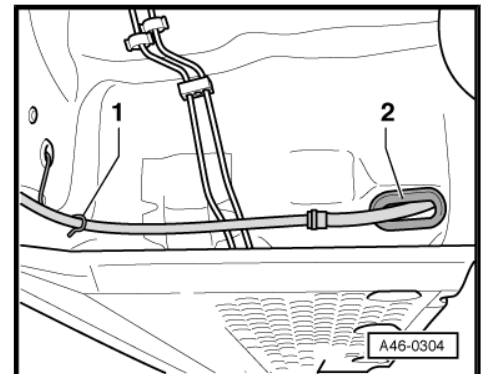
- First pull handbrake cable -1- off the locking lugs, then pull completely out of bracket -2-.

**Continuation for all vehicles**



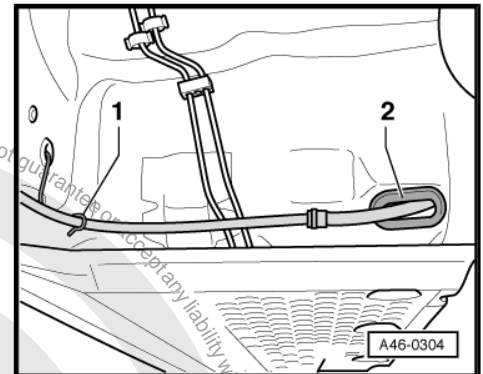
- Detach handbrake cable from bracket -1- and pull handbrake cable out of guide tube -2-.

**Installing**



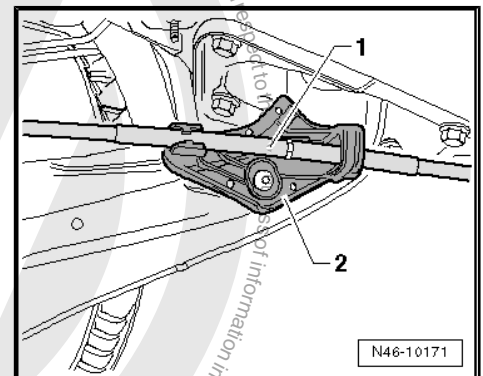
- Push handbrake cable into guide tube -2- and attach it into bracket -1-.

**Vehicles with retainer for hand brake cable**



- Insert handbrake cable -1- through aperture, then clamp it to bracket -2-.

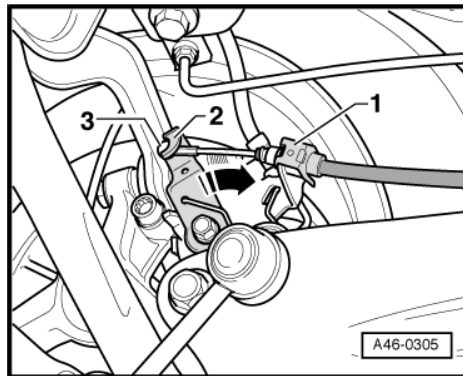
**Vehicles with spring clip on handbrake cable**





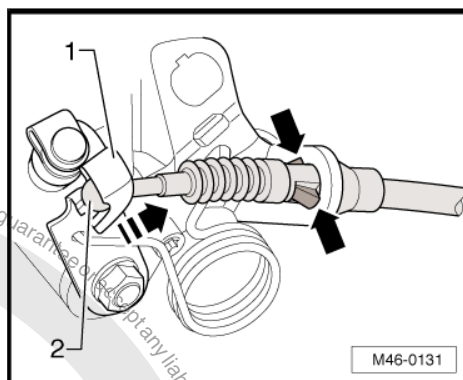
- Press lever on brake caliper -2- in -direction of arrow- and attach handbrake cable -3-.
- Press spring clips -1- onto handbrake cable.

#### Vehicles with locking lugs on handbrake cable



- Push handbrake cable into brake caliper bracket so that the locking pins -arrows- engage.
- Press lever on brake caliper -1- in -direction of arrow- and attach handbrake cable -2-.

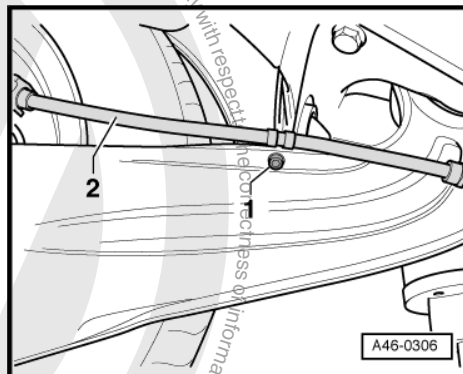
#### Vehicles without retainer for hand brake cable



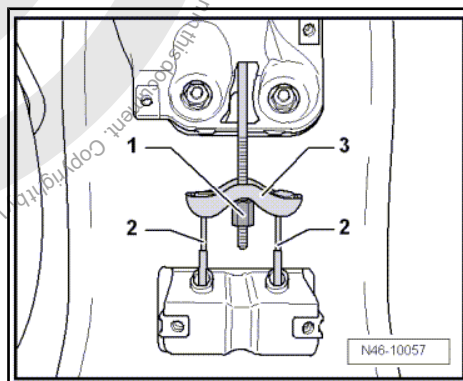
Handbrake cable -2- must be installed without tension between brake caliper bracket and fastening clip.

- Therefore, fastening clip -1- should only now be screwed onto trailing arm.

#### Continuation for all vehicles



- Attach handbrake cable -2- into compensator -3-.
- Pretension handbrake cable with adjustment nut -1-.
- Adjust handbrake ⇒ [page 101](#) .



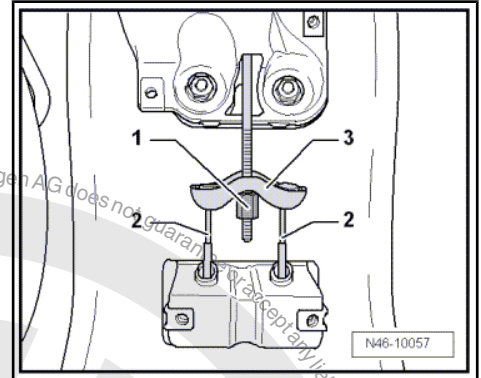
## 9.2 Removing and installing handbrake cable from model year 2008

### Removing

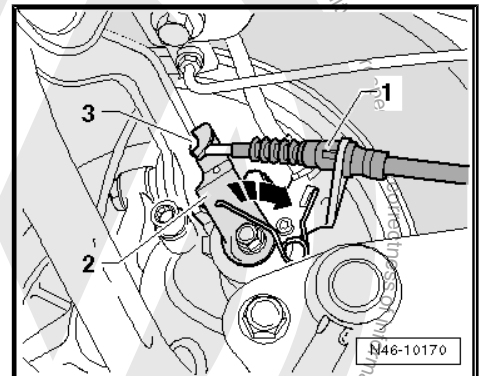
- Release handbrake
- Remove centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .



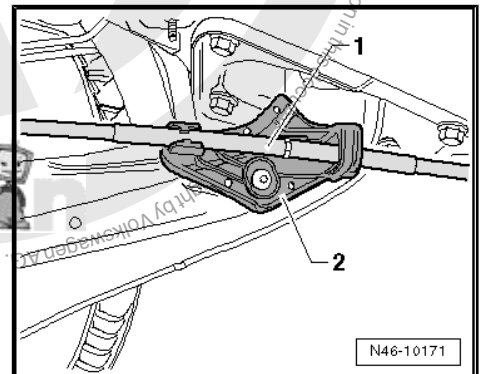
- Release adjustment nut -1- until relevant handbrake cable -2- can be detached from compensator -3-.



- Press lever on brake caliper -2- in direction of arrow and detach handbrake cable -3-.
- Compress locking lugs -1- together and pull handbrake cable out of bracket on brake caliper.

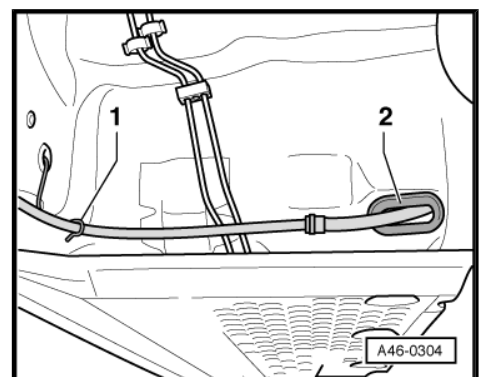


- First pull handbrake cable -1- off locking lugs, then pull completely out of bracket -2-.



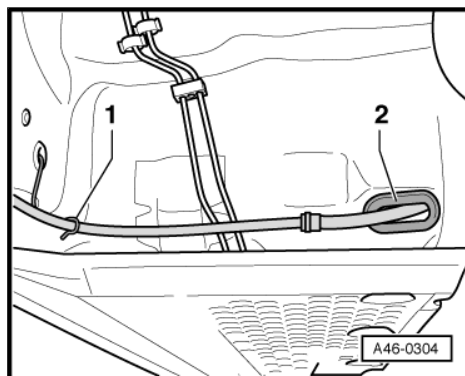
- Detach handbrake cable from bracket -1- and pull handbrake cable out of guide tube -2-.

#### Installing

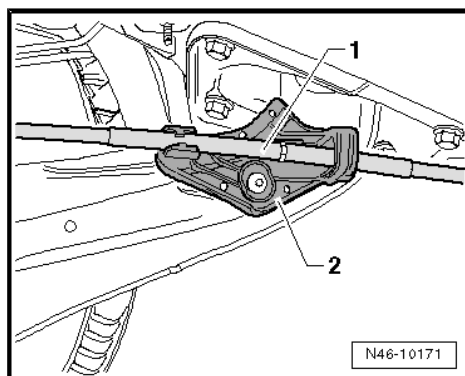




- Push handbrake cable into guide tube -2- and attach it into bracket -1-.

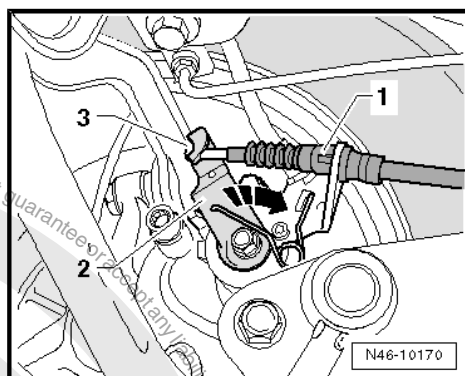


- Insert handbrake cable -1- through aperture, then clamp it to bracket -2-.

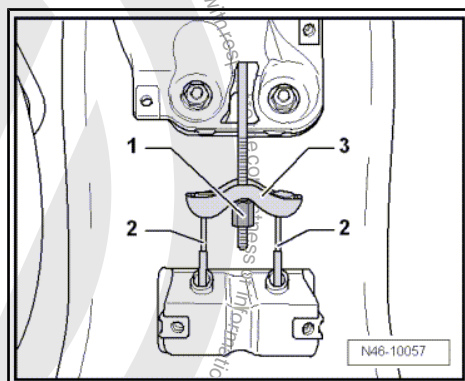


- Push handbrake cable into bracket on brake caliper until both locking lugs -1- engage.
- Press lever on brake caliper -2- in direction of arrow and attach handbrake cable -3-.

The handbrake cable must be installed without tension between the brake caliper bracket and the bracket on the trailing arm.



- Attach handbrake cable -2- into compensator -3-.
- Pretension handbrake cable with adjustment nut -1-.
- Adjust handbrake ⇒ [page 101](#) .





## 10 Assembly overview - brake pedal



### WARNING

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

Grease all bearing points with grease -G 000 602- before installing.

#### 1 - Mounting bracket

- ☐ Allocation ➔ Electronic parts catalogue "ETKA"

#### 2 - Hexagon nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew after removing.

#### 3 - Brake light switch -F-

- ☐ Including brake pedal switch -F47- .
- ☐ In vehicles from week 50/2005, the brake light switch -F- is located on the brake master cylinder ➔ [page 134](#) .
- ☐ Before installing brake light switch, connect brake pedal to brake servo push rod ➔ [page 110](#) .
- ☐ Lubricate plunger tip with polycarbamide grease -G 052 142 A2- .
- ☐ Adjusting brake light switch ➔ [page 111](#) .

#### 4 - Mounting bracket

- ☐ Allocation ➔ Electronic parts catalogue "ETKA"

#### 5 - Hexagon bolt

#### 6 - Brake pedal

#### 7 - Cap

#### 8 - Sleeve bearing

#### 9 - Mounting

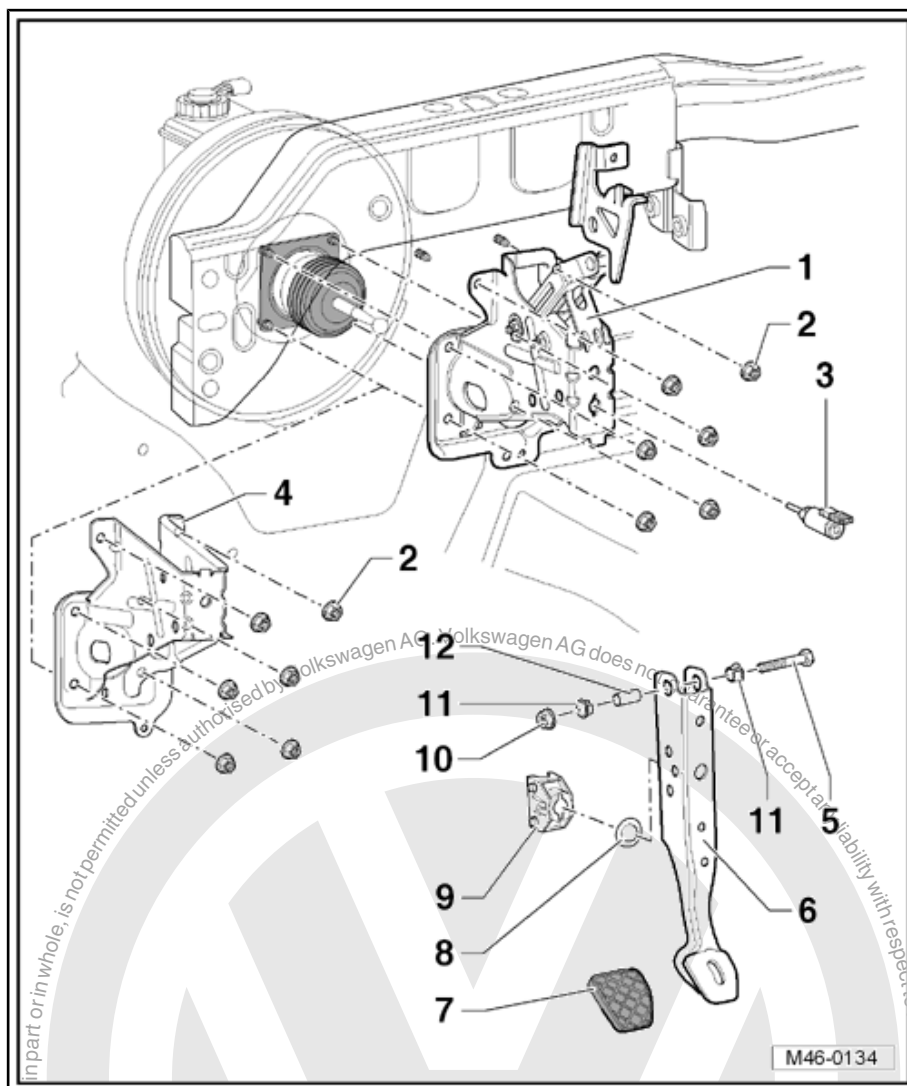
- ☐ For ball head of brake servo plunger rod.

#### 10 - Hexagon nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew after removing.

#### 11 - Sleeve bearing

#### 12 - Pivot pin

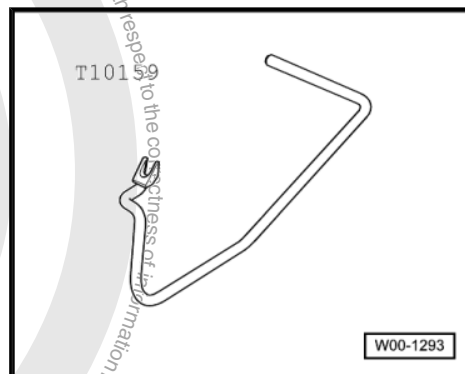




## 10.1 Separating brake pedal from brake servo

### Special tools and workshop equipment required

- ◆ Release tool -T10159-



- Remove trim on driver's side ⇒ General body repairs, interior; Rep. Gr. 70; Dash panel

Vehicles with brake light switch on mounting bracket only:

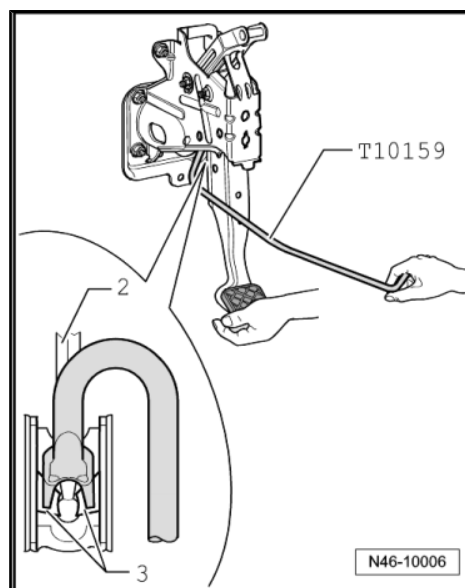
- Pull connector off brake light switch -F- .
- Remove brake light switch -F- by turning 45° to left.

Continuation for all vehicles:

- First press brake pedal in direction of brake servo and hold.
- 2 - Plunger rod
- 3 - Retaining lugs
- Insert release tool -T10159- and pull in direction of driver seat. When doing this, counter-hold on brake pedal. (At this stage the pedal must not be allowed to move backwards.) This action will press retaining lugs -3- of mounting off ball head of plunger rod -2-.

For the sake of clarity, separation of brake pedal from brake servo is shown with pedal cluster removed.

- Pull release tool -T10159- and brake pedal together towards driver seat. (This action will pull the brake pedal off the ball head of the plunger rod).

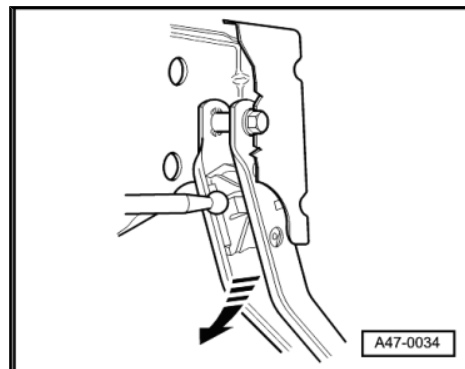


## 10.2 Clipping brake pedal to brake servo

- Hold ball head of plunger rod in front of mounting and push brake pedal in direction of brake servo, so that the ball head audibly locks into place.

Continue installation in reverse order.

- Installing and adjusting brake light switch -F- ⇒ [page 111](#) .





### 10.3 Brake light switch -F- up to week 50/05 (left-hand drive vehicles)

Including brake pedal switch -F47-

In vehicles from week 50/2005, the brake light switch is located on the brake master cylinder ➔ [page 134](#) .

**The brake light switch -F- must only be installed once, otherwise the brake light switch lock will be damaged and a tight seat is not guaranteed anymore.**

The Brake light switch -F- must be removed for adjustment.

- Remove trim on driver's side ➔ General body repairs, interior; Rep. Gr. 70 ; Dash panel

#### Removing

- Pull connector off brake light switch -F- .
- Remove brake light switch -F- by turning 45° to left.

#### Installing and adjusting

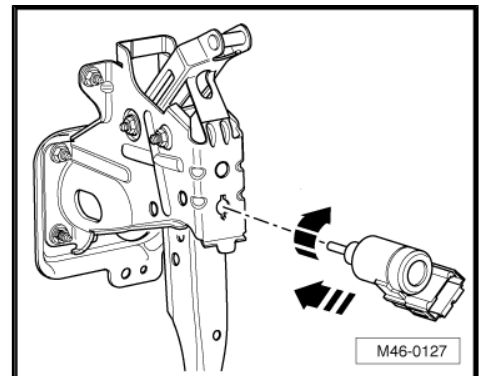
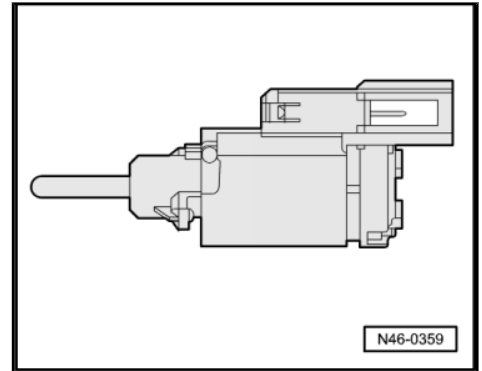
**To ensure secure installation, install brake light switch -F- only once.**

Before assembling the brake light switch, grease plunger head with polycarbamide grease -G 052 142 A2- .

- Before installing, pull plunger out fully.
- Guide switch through fitting hole, press against pedal and secure by turning 45° to right.
- Brake pedal must remain at rest position (not depressed).
- Fit brake light switch connector.
- Check function of brake light.

**After adjusting the brake light switch check whether the brake pedal is on the end stop (rest position).**

- Install trim on driver's side ➔ General body repairs, interior; Rep. Gr. 70 ; Dash panel





## 10.4 New version of brake light switch (left-hand drive vehicles)



### Note

- ◆ Use only new brake light switches.
- ◆ The most noticeable difference to the old brake light switch is the new, bright tip of the plunger -A-.

### Removing

- Remove trim on driver's side ⇒ General body repairs, interior; Rep. Gr. 70 ; Dash panel
- If necessary, remove footwell vent ⇒ Heater, air conditioning system; Rep. Gr. 80 ; Repairing heater; Removing vent .
- Pull connector off brake light switch.

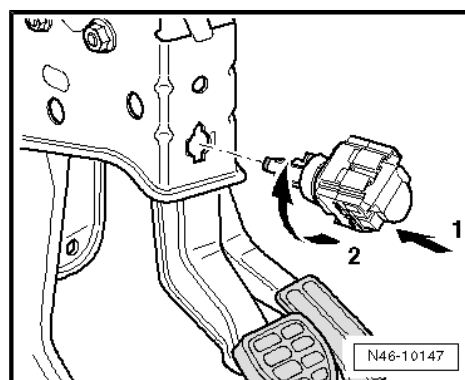
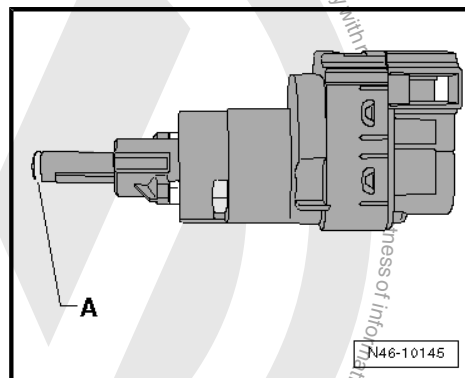
The brake light switch may be removed only while operating rod is pressed in (brake pedal is not operated), or the locking mechanism of the brake light switch will be damaged.

- Remove brake light switch by turning 45° to left.

### Installing, adjusting and locking

Before assembling the brake light switch, grease the bright tip of the plunger head with polycarbamide grease G 052 142 A2.

- The brake pedal must remain at rest position while the brake light switch is being installed. The brake pedal must not be touched by anything but the plunger head throughout the entire installation.
- Guide brake light switch through fitting hole -arrow 1- and press it against pedal with head of plunger. Then turn brake light switch 45° to right -arrow 2- until it can be felt to engage.
- Fit brake light switch connector.
- Check function of brake light.
- Install footwell vent ⇒ Heating and air conditioning system; Rep. Gr. 80 ; Repairing heating; Removing vents .
- Install trim on driver's side ⇒ General body repairs, interior; Rep. Gr. 70 ; Dash panel





## 10.5 Brake light switch (right-hand drive vehicles)

### Removing

- Remove trim on driver's side ⇒ General body repairs, interior; Rep. Gr. 70 ; Dash panel
- If necessary, remove footwell vent ⇒ Heater, air conditioning system; Rep. Gr. 80 ; Repairing heater; Removing vent .
- Pull connector off brake light switch.

The brake light switch may be removed only while operating rod is pressed in (brake pedal is not operated), or the locking mechanism of the brake light switch will be damaged.

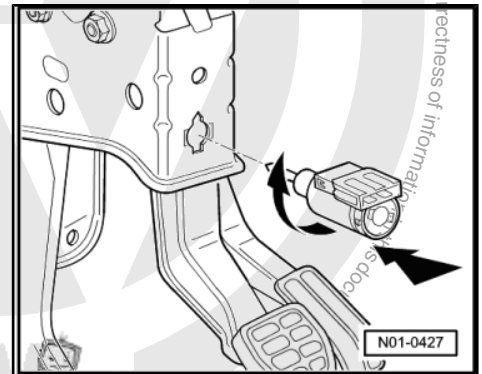
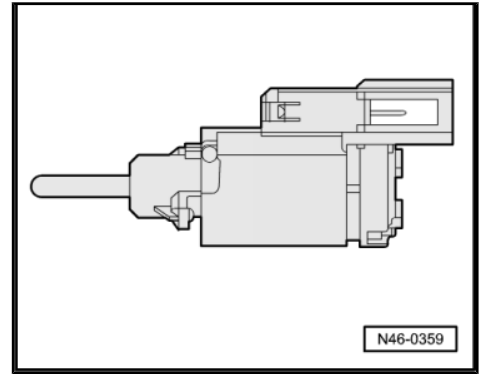
- Remove brake light switch by turning 45° to left.

### Installing, adjusting and locking

To ensure secure installation, install brake light switch only once.

Before assembling the brake light switch, grease plunger head with polycarbamide grease G 052 142 A2.

- Before installing, pull plunger out fully.
- The brake pedal must remain at rest position while the brake light switch is being installed. The brake pedal must not be touched by anything but the plunger head throughout the entire installation.
- Guide brake light switch through fitting hole and press it against pedal with plunger head. Then turn brake light switch 45° to right until it can be felt to engage.
- Fit brake light switch connector.
- Check function of brake light.
- Install footwell vent ⇒ Heating and air conditioning system; Rep. Gr. 80 ; Repairing heating; Removing vents .
- Install trim on driver's side ⇒ General body repairs, interior; Rep. Gr. 70 ; Dash panel





## 47 – Brakes - hydraulics

### 1 Repairing front FS III brake caliper

- ◆ When carrying out repairs, install all parts supplied in repair kit.
- ◆ Use only methylated spirits for cleaning the brake.
- ◆ Apply thin coat of assembly paste -G 052 150 A2- to brake cylinder, piston and seal.

#### 1 - Dust cap

- ❑ Fit onto bleeder valve.

#### 2 - Bleeder valve

- ❑ 10 Nm
- ❑ Before screwing in, apply thin coat of assembly paste -G 052 150 A2- to thread.

#### 3 - Cover caps

- ❑ Insert into sleeve bearing.

#### 4 - Guide pin

- ❑ 30 Nm

#### 5 - Sleeve bearing

- ❑ Insert into brake caliper.

#### 6 - Brake caliper

#### 7 - Protective cap

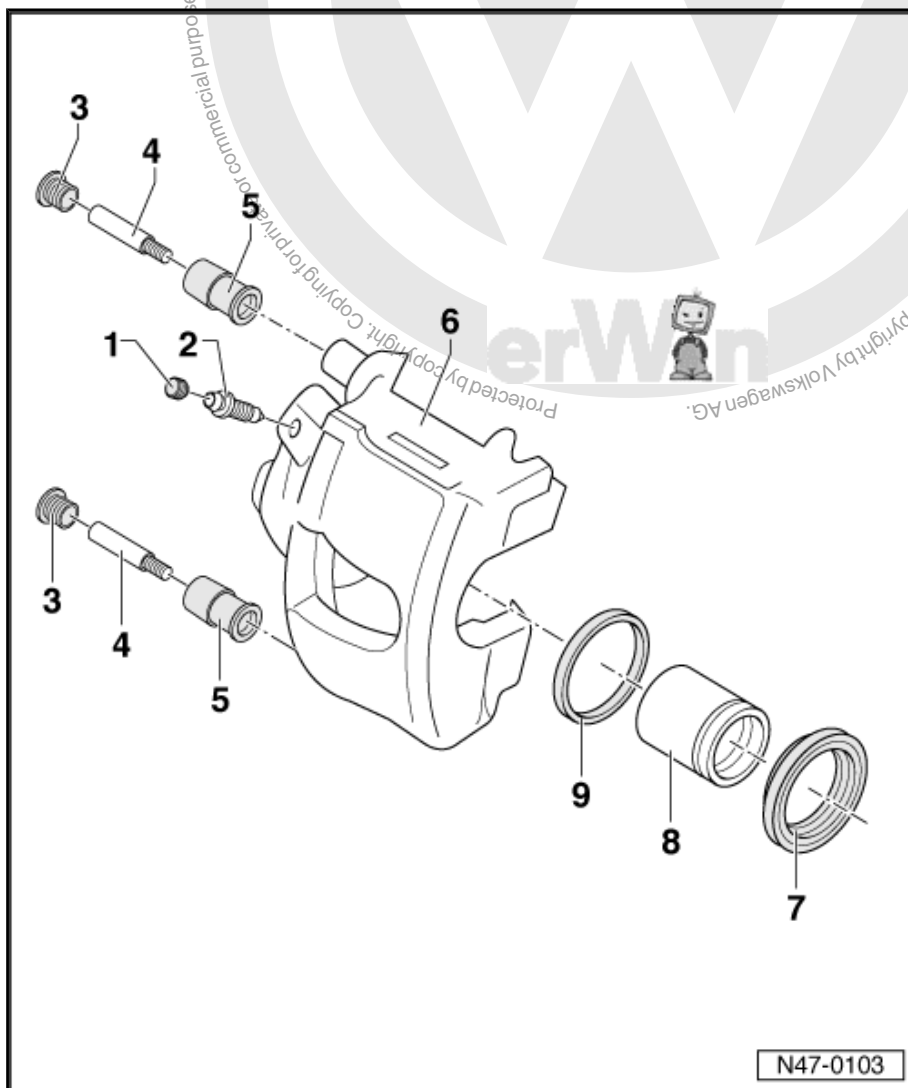
- ❑ Removing and installing  
⇒ [page 114](#) .
- ❑ Take care not to damage when inserting piston.

#### 8 - Piston

- ❑ Removing and installing  
⇒ [page 114](#) .
- ❑ Apply thin coat of assembly paste -G 052 150 A2- to piston before inserting.

#### 9 - Sealing ring

- ❑ Removing and installing  
⇒ [page 114](#) .

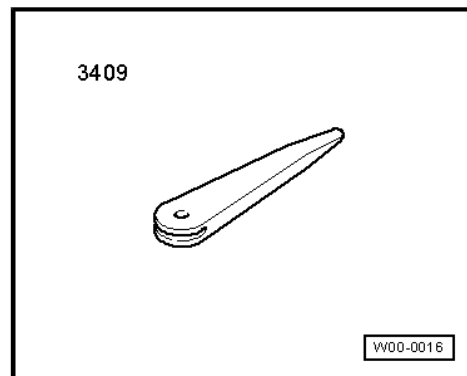


### 1.1 Removing and installing piston for brake caliper FS III

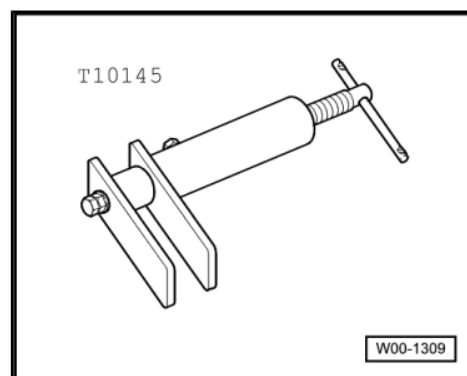
Special tools and workshop equipment required



◆ Removal wedge -3409-



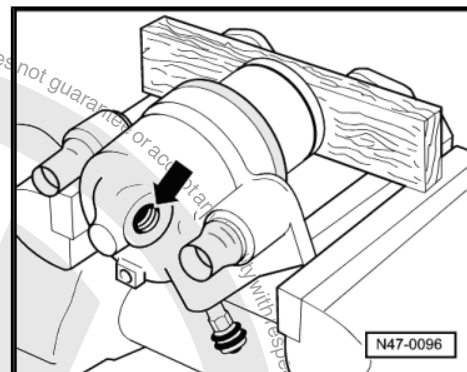
◆ Piston resetting appliance -T 10145-



**Removing**

- Press piston out of brake caliper using compressed air.

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

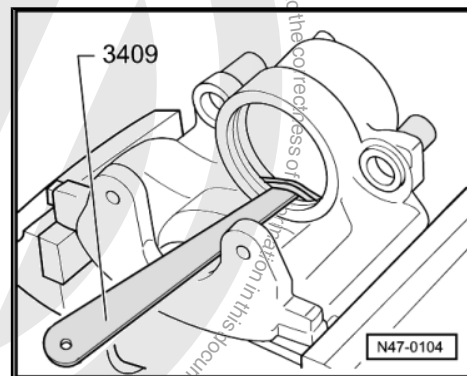


- Remove seal using removal wedge -3409- .

When removing ensure that the surface of the cylinder is not damaged.

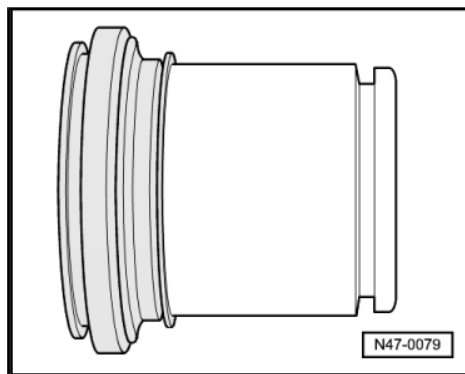
**Installing**

- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Apply thin coat of assembly paste -G 052 150 A2- to piston and sealing ring before inserting.
- Insert seal into brake caliper.

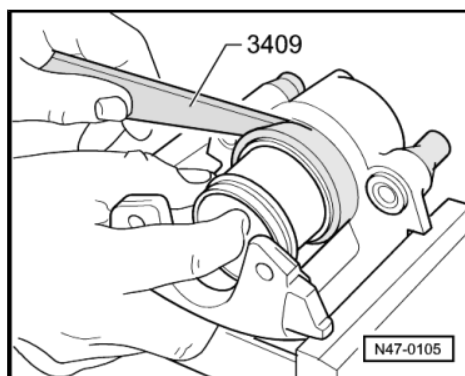




- Place outer sealing lip of protective cap on the piston.
- Using the removal wedge -3409-, insert the inner sealing lip into the groove of cylinder.

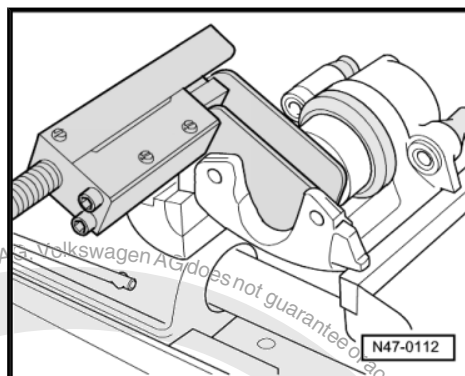


When doing this, hold piston in front of brake caliper.



- Press piston into brake caliper with piston resetting tool.

The outer sealing lip on the protective cap will then slip into the piston groove.





## 2 Repairing front FN 3 brake caliper

- ◆ When carrying out repairs, install all parts supplied in repair kit.
- ◆ Use only methylated spirits for cleaning the brake.
- ◆ Apply thin coat of assembly paste -G 052 150 A2- to brake cylinder, piston and seal.

### 1 - Dust cap

- ☐ Fit onto bleeder valve.

### 2 - Bleeder valve

- ☐ 10 Nm
- ☐ Before screwing in, apply thin coat of assembly paste -G 052 150 A2- to thread.

### 3 - Cover caps

- ☐ Insert into sleeve bearing.

### 4 - Guide pin

- ☐ 30 Nm

### 5 - Sleeve bearing

- ☐ Insert into brake caliper.

### 6 - Brake caliper

### 7 - Brake carrier

- ☐ Bolt onto brake caliper.

### 8 - Retaining spring

- ☐ Insert with both ends in holes in brake caliper.

### 9 - Sealing ring

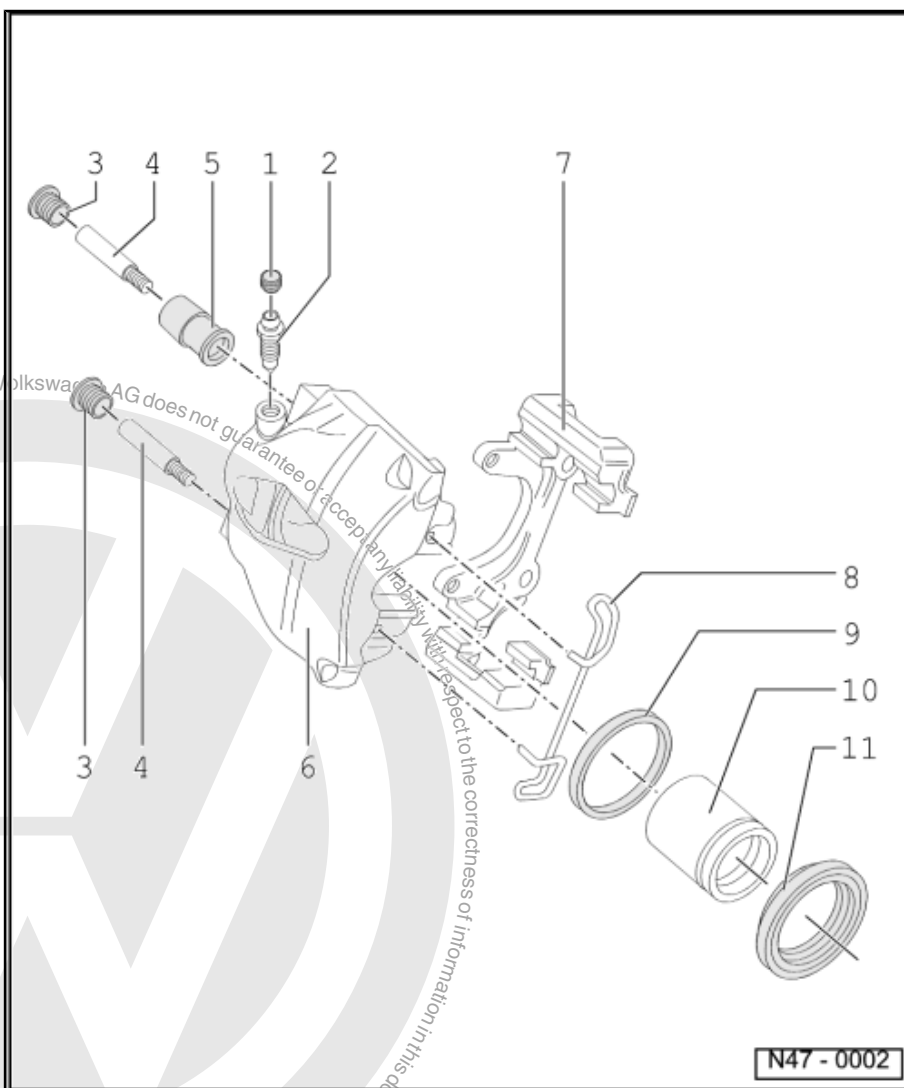
- ☐ Removing and installing  
⇒ [page 118](#) .

### 10 - Piston

- ☐ Removing and installing  
⇒ [page 118](#) .
- ☐ Apply thin coat of assembly paste -G 052 150 A2- to piston before inserting.

### 11 - Protective cap

- ☐ Removing and installing ⇒ [page 118](#) .
- ☐ Take care not to damage when inserting piston.

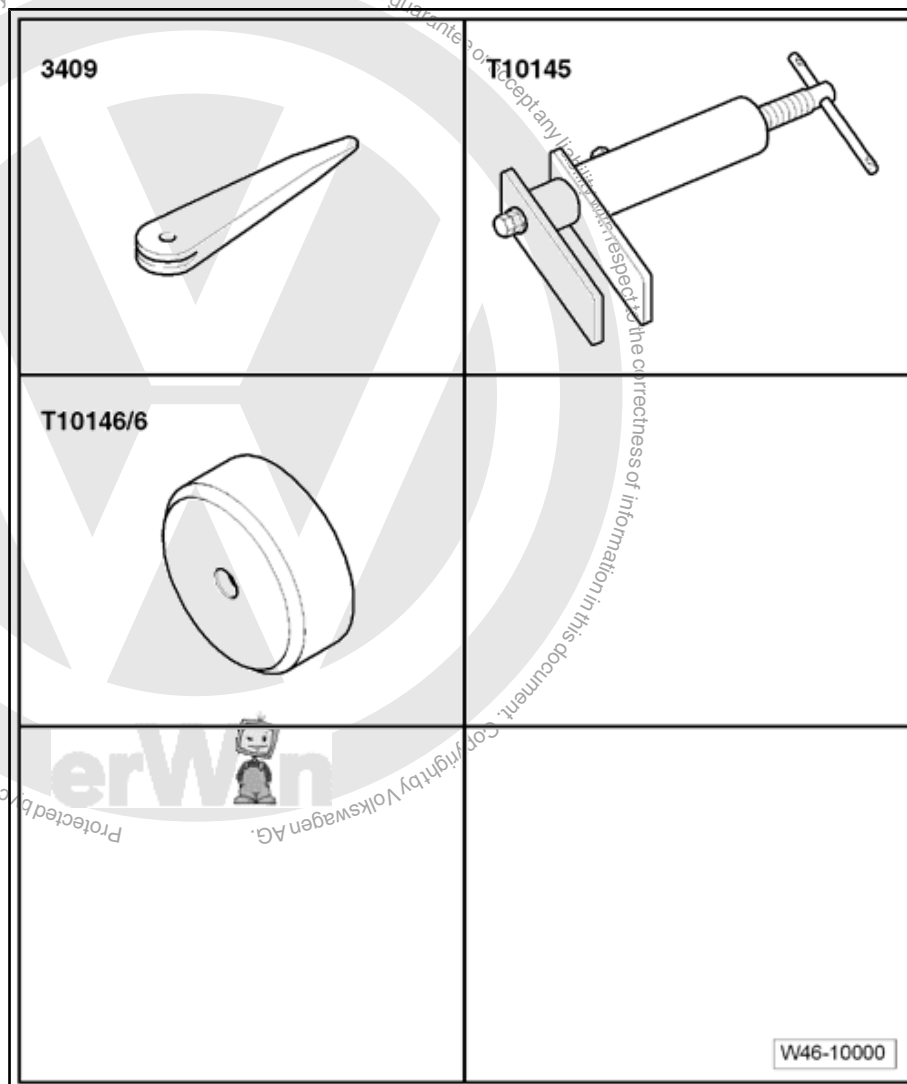




## 2.1 Removing and installing piston for brake caliper FN 3

### Special tools and workshop equipment required

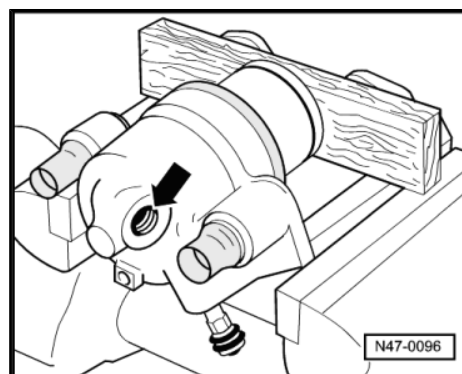
- ◆ Removal wedge - 3409-
- ◆ Piston resetting appliance - T10145-
- ◆ Assembly tool for protective caps - T10146/6-



### Removing

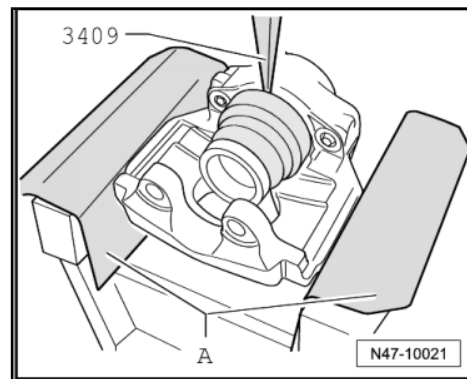
- Press piston out of brake caliper using compressed air -arrow-.

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





- Lever off protective cap from brake caliper using removal wedge -3409- .

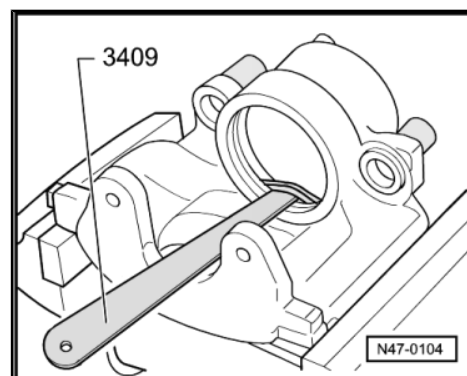


- Remove seal using removal wedge -3409- .

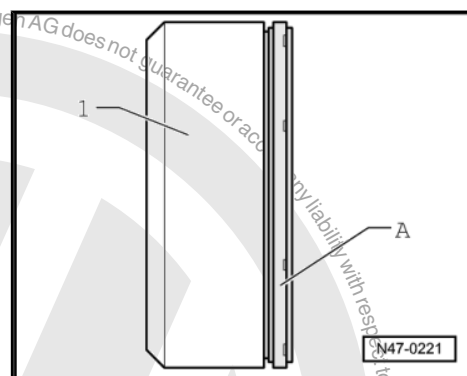
When removing ensure that the surface of the cylinder is not damaged.

#### Installing

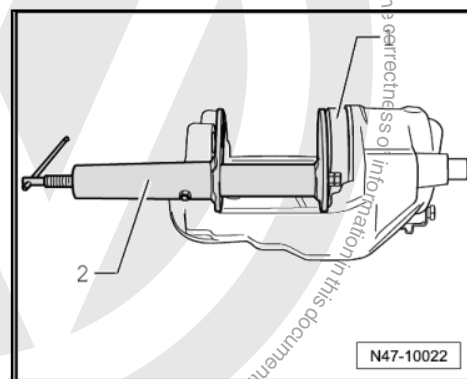
- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Apply thin coat of assembly paste -G 052 150 A2- to piston and sealing ring before inserting.
- Insert seal into brake caliper.



- Fit protective cap -A- in assembly tool -T10146/6- -1-.



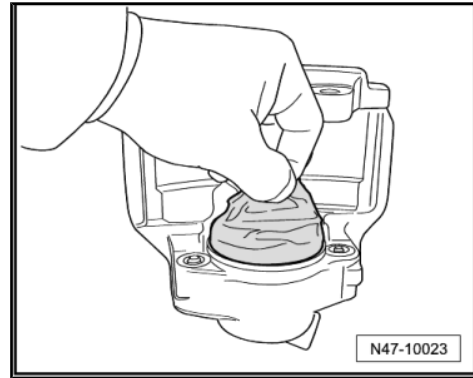
- Press protective cap onto brake caliper so that seal is fitted correctly all around using assembly tool -1- and piston resetting appliance -T10145- -2-.





### Check seat of protective cap:

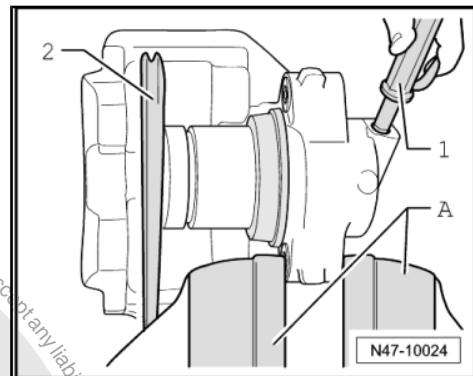
- At this stage it should not be possible to remove protective cap from brake caliper by hand.



- Press piston lightly onto protective cap and lock it in this position with, for example, an removal wedge -3409- -2-.

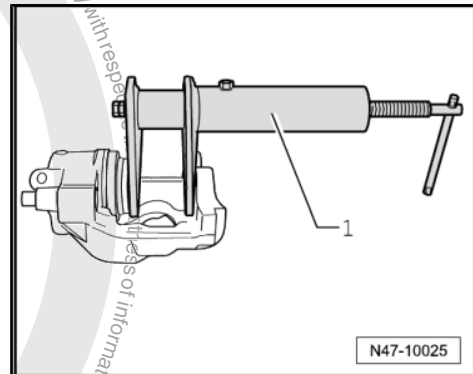
### Keep piston straight to prevent damage to sealing collar.

- Blow compressed air (max 3 bar) -1- into protective seal. During this step protective cap will spring on piston.



- Press piston into brake caliper using piston resetting appliance -1-.

The outer sealing lip on the protective cap will then slip into the piston groove.





## 3 Repairing rear brake caliper

### 3.1 Repairing brake caliper C 38/CII 38

- ◆ When carrying out repairs, install all parts supplied in repair kit.
- ◆ Use only methylated spirits for cleaning the brake.
- ◆ New brake calipers are filled with brake fluid and are pre-bled.
- ◆ Apply thin coat of assembly paste -G 052 150 A2- to brake cylinder, piston and seal.
- ◆ When repairs are performed, it is essential to appropriately pre-bleed brake calipers (without brake pads) before installing in vehicle ➔ [page 125](#) .

#### 1 - Brake caliper with hand-brake cable lever

- ☐ If there is a leak at hand-brake cable lever, re-new brake caliper.
- ☐ Following repair work, pre-bleed brake caliper ➔ [page 125](#) .

#### 2 - Dust cap

#### 3 - Bleeder valve

- ☐ 10 Nm
- ☐ Before screwing in, apply thin coat of assembly paste -G 052 150 A2- to thread.

#### 4 - Hexagon bolt

- ☐ 35 Nm
- ☐ Self-locking
- ☐ Renew.
- ☐ When loosening and tightening, counterhold on guide pin.

#### 5 - Guide pin

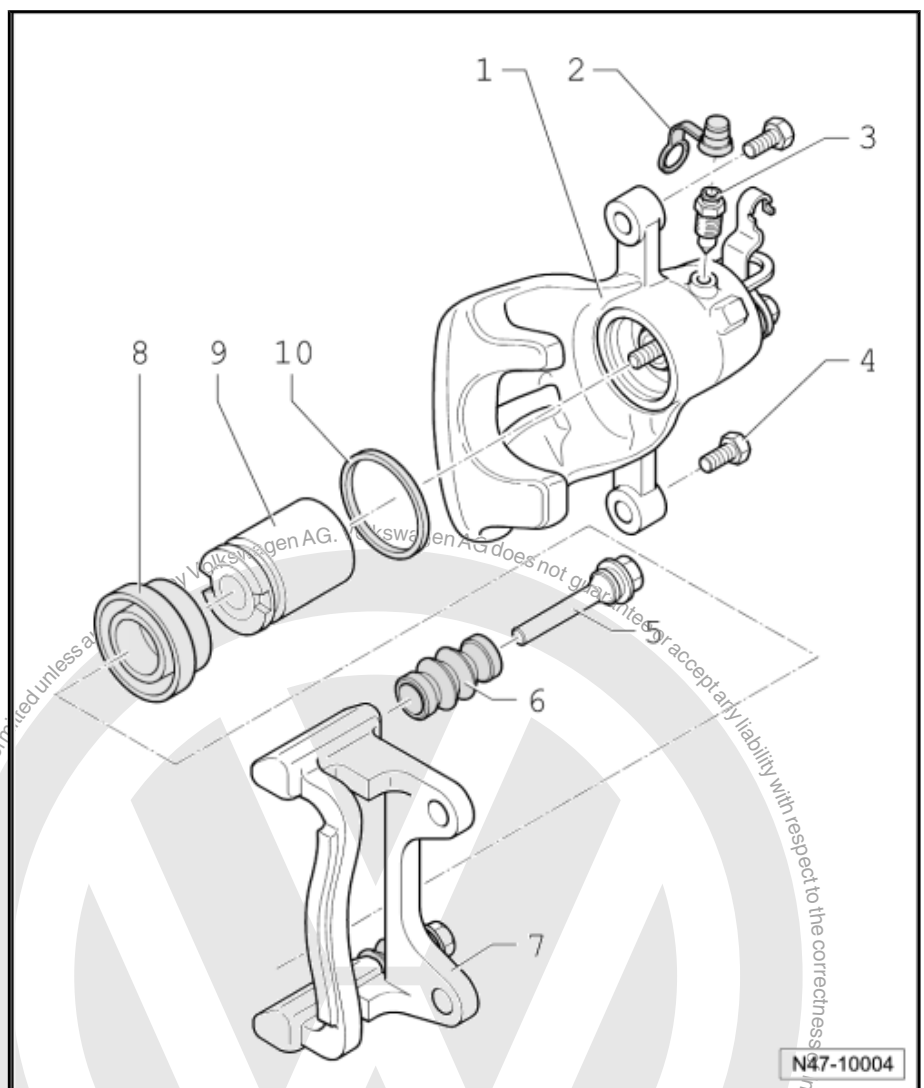
- ☐ Grease before fitting protective cap.

#### 6 - Protective cap

- ☐ Fit onto brake carrier and guide pin.

#### 7 - Brake carrier with guide pin(s) and protective cap

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.
- ☐ Allocation ➔ Electronic parts catalogue "ETKA"





#### 8 - Protective cap

- ☐ Pull on so that outer sealing lip goes over piston.
- ☐ Removing and installing ⇒ [page 124](#) .

#### 9 - Piston with automatic adjustment

- ☐ Removing and installing ⇒ [page 124](#) .
- ☐ Apply thin coat of assembly paste -G 052 150 A2- to piston before inserting.

#### 10 - Sealing ring

- ☐ Removing and installing ⇒ [page 124](#) .

### 3.2 Repairing CII 41 brake caliper

- ◆ When carrying out repairs, install all parts supplied in repair kit.
- ◆ Use only methylated spirits for cleaning the brake.
- ◆ New brake calipers are filled with brake fluid and are pre-bled.
- ◆ Apply thin coat of assembly paste -G 052 150 A2- to brake cylinder, piston and seal.





- ◆ When repairs are performed, it is essential to appropriately pre-bleed brake calipers (without brake pads) before installing in vehicle ⇒ [page 125](#) .

### 1 - Brake caliper with hand-brake cable lever

- ☐ If there is a leak at hand-brake cable lever, re-new brake caliper.
- ☐ Following repair work, pre-bleed brake caliper ⇒ [page 125](#)

### 2 - Dust cap

### 3 - Bleeder valve

- ☐ 10 Nm
- ☐ Before screwing in, apply thin coat of assembly paste -G 052 150 A2- to thread.

### 4 - Self-locking hexagon bolt, 35 Nm

- ☐ Renew.
- ☐ When loosening and tightening, counterhold on guide pin.

### 5 - Guide pins with steps

- ☐ Shorter than ⇒ [Item 6 \(page 123\)](#)
- ☐ Grease before fitting protective cap.
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

### 6 - Guide pin

- ☐ Longer than ⇒ [Item 5 \(page 123\)](#)
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

### 7 - Protective cap

- ☐ Fit onto brake carrier and guide pin.

### 8 - Brake carrier with guide pin(s) and protective cap

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

### 9 - Protective cap

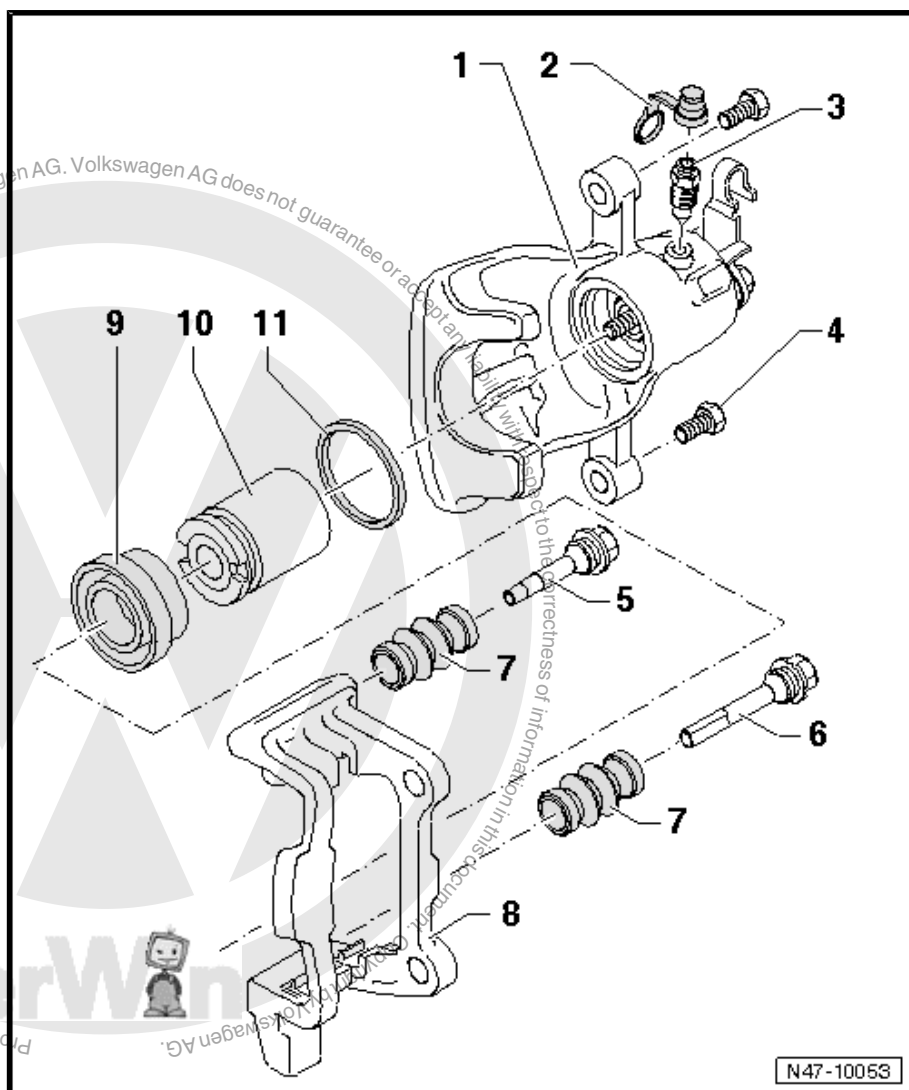
- ☐ Pull on so that outer sealing lip goes over piston.
- ☐ Removing and installing ⇒ [page 124](#) .

### 10 - Piston with automatic adjustment

- ☐ Removing and installing ⇒ [page 124](#) .
- ☐ Apply thin coat of assembly paste -G 052 150 A2- to piston before inserting.

### 11 - Sealing ring

- ☐ Removing and installing ⇒ [page 124](#) .

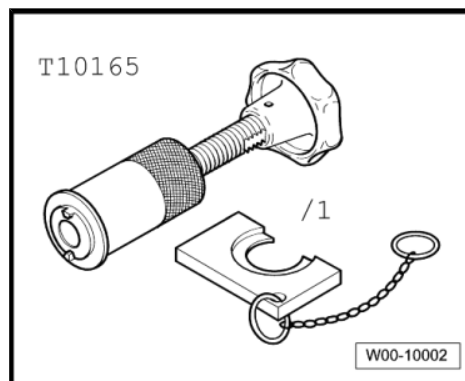




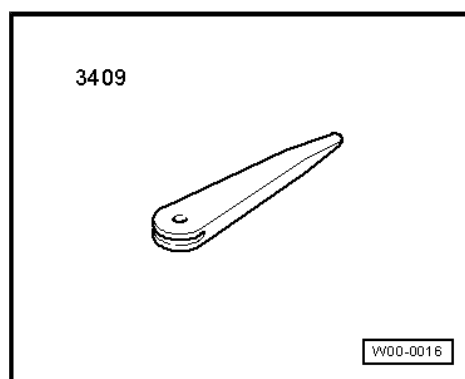
### 3.3 Removing brake caliper piston

#### Special tools and workshop equipment required

- ◆ Piston compressing tool -T10165-



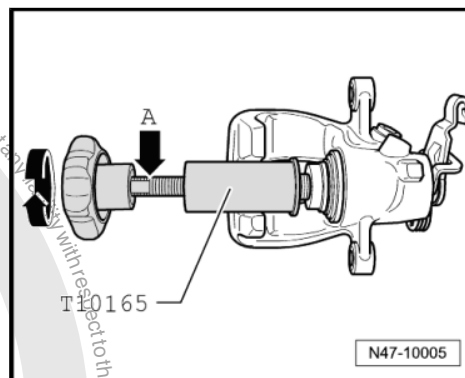
- ◆ Removal wedge -3409-



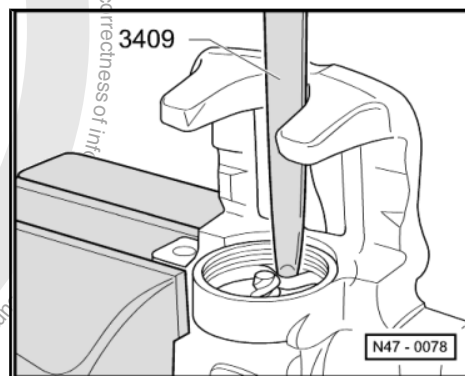
- Screw piston out of brake caliper by turning thumb wheel anti-clockwise.

Apply resetting and removal tool so that collar of tool is resting on piston.

- ◆ If pistons are difficult to move, a 13 mm open-end spanner can be used on intended flats -arrow A-.



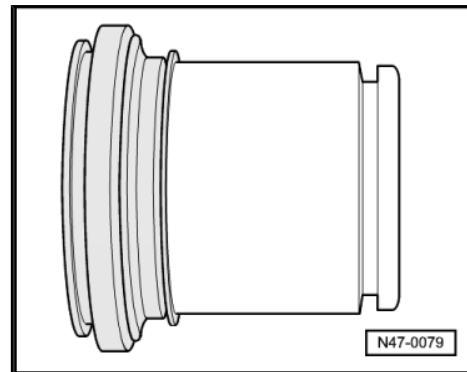
- Remove seal using removal wedge -3409- .





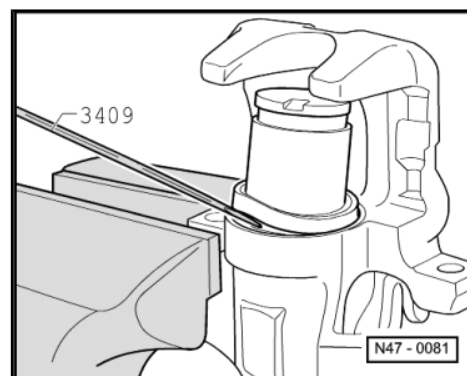
### 3.4 Installing brake caliper piston

- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Apply thin coat of assembly paste -G 052 150 A2- to piston and sealing ring before inserting.
- Place protective cap with outer sealing lip onto piston.

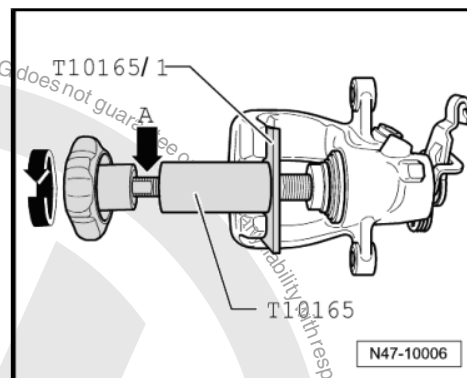


- Using removal wedge -3409- , insert inner sealing lip into cylinder groove.

When doing this, hold piston in front of brake caliper.



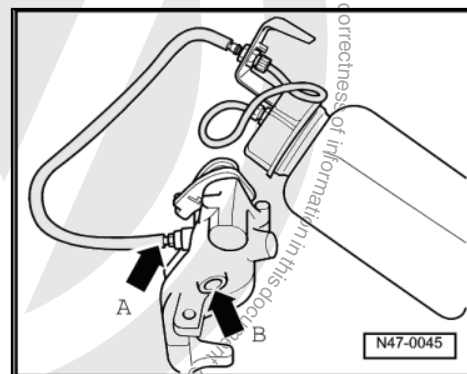
- Screw in piston by turning thumb wheel clockwise.
- To aid screwing in, use plate -T10165/1- .
- ◆ Apply resetting and removal tool so that collar of tool is resting on brake caliper.
- ◆ If the piston is pushed back with a piston resetting appliance -T10145- or by operating the foot brake the automatic adjustment in the brake caliper is destroyed.



### 3.5 Pre-bleeding brake caliper

- Open bleeder valve -arrow A- and, using a commercially available bleeder bottle, fill with brake fluid until bubble-free brake fluid flows from threaded hole of brake hose connection -arrow B-. Close bleeder valve.

Position brake caliper as illustrated to pre-bleed.





## 4 Repairing Bosch rear brake calipers

- ◆ When carrying out repairs, install all parts supplied in repair kit.
- ◆ Use only methylated spirits for cleaning the brake.
- ◆ New brake calipers are filled with brake fluid and are pre-bled.
- ◆ Apply thin coat of assembly paste -G 052 150 A2- to brake cylinder, piston and seal.
- ◆ When repairs are performed, it is essential to appropriately pre-bleed brake calipers (without brake pads) before installing in vehicle ⇒ [page 129](#) .

### 1 - Brake caliper with hand-brake cable lever

- ☐ If there is a leak at hand-brake cable lever, re-new brake caliper.
- ☐ Following repair work, pre-bleed brake caliper ⇒ [page 129](#) .

### 2 - Bleeder valve

- ☐ 10 Nm.
- ☐ Before screwing in, apply thin coat of assembly paste -G 052 150 A2- to thread.

### 3 - Dust cap

### 4 - Bolt

- ☐ 35 Nm.
- ☐ Self-locking
- ☐ Renew.
- ☐ When loosening and tightening, counterhold on guide pin.

### 5 - Upper guide pin

- ☐ Grease before fitting protective cap.
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

### 6 - Protective cap

- ☐ Fit onto brake carrier and guide pin.

### 7 - Lower guide pin

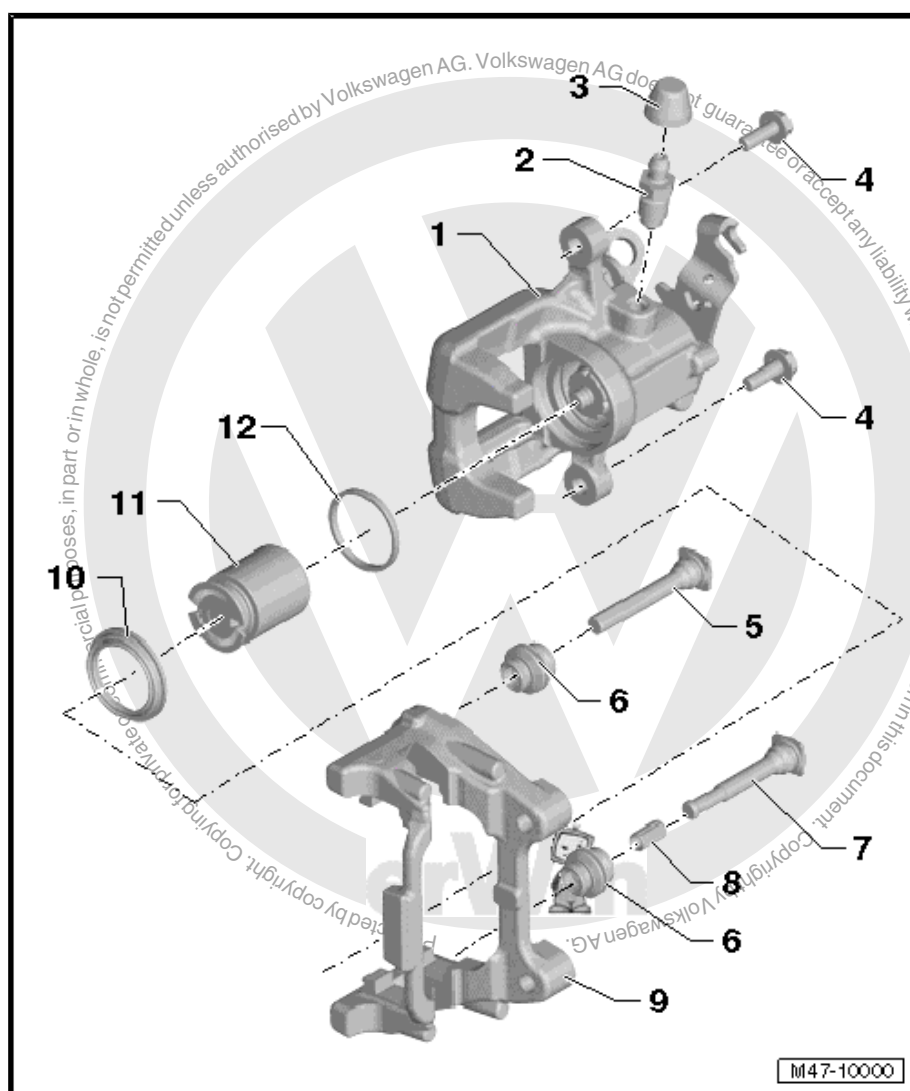
- ☐ With recess.
- ☐ Grease before fitting protective cap.
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

### 8 - Guide grommet

- ☐ On lower guide pin.

### 9 - Brake carrier

- ☐ Supplied as genuine part, assembled with sufficient grease on guide pins.
- ☐ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.





- ❑ Allocation ⇒ Electronic parts catalogue "ETKA"

#### 10 - Protective cap

- ❑ Pull on so that outer sealing lip goes over piston.
- ❑ Removing and installing ⇒ [page 127](#)

#### 11 - Piston with automatic adjustment

- ❑ Removing and installing ⇒ [page 127](#)
- ❑ Apply thin coat of assembly paste -G 052 150 A2- to piston before inserting.

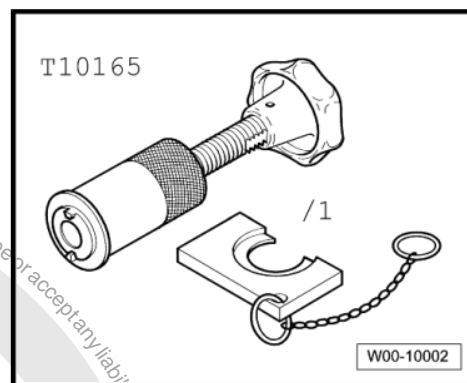
#### 12 - Sealing ring

- ❑ Removing and installing ⇒ [page 127](#)

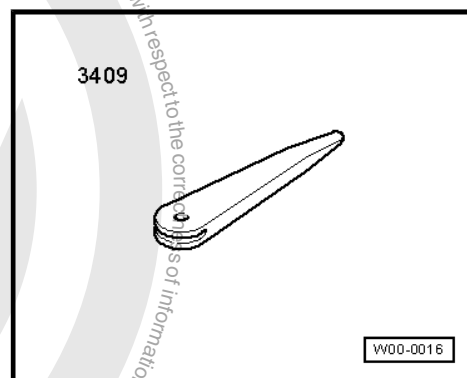
## 4.1 Removing and installing brake caliper piston

### Special tools and workshop equipment required

- ◆ Piston compressing tool -T10165-



- ◆ Removal wedge -3409-



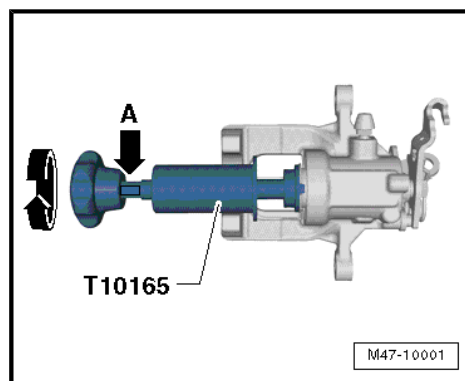
### Removing

- Screw piston out of brake caliper by turning thumb wheel anti-clockwise.



Insert piston compressing tool -T10165- so that collar rests on piston.

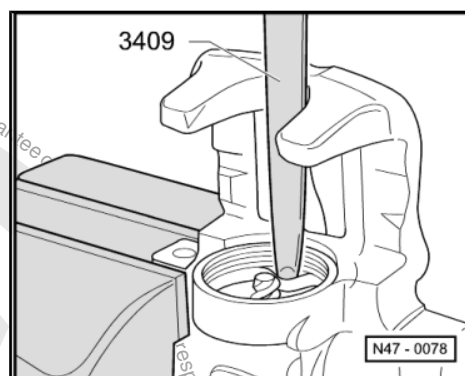
- ♦ If pistons are difficult to move, a 13 mm open-end spanner can be used on intended flats -arrow A-.



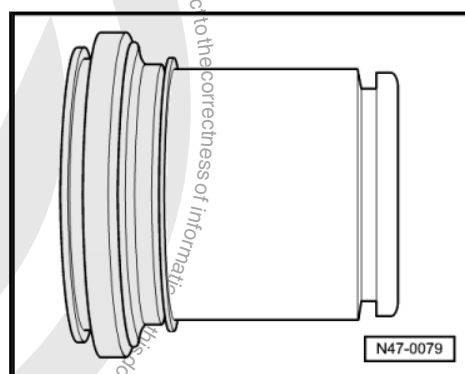
- Remove seal using removal wedge -3409- .

### Installing

- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Apply thin coat of assembly paste -G 052 150 A2- to piston and seal before installing.

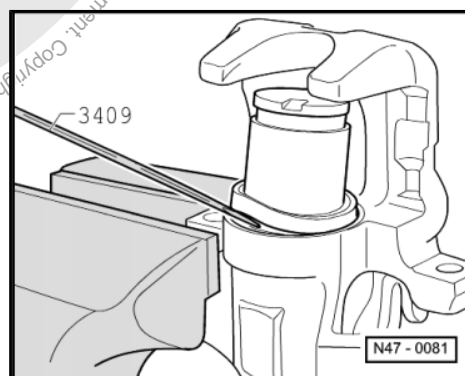


- Place protective cap with outer sealing lip on piston.



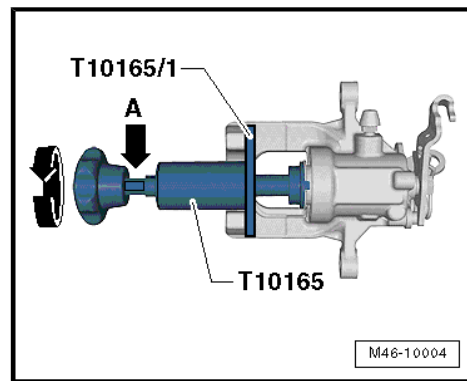
- Using removal wedge -3409- , insert inner sealing lip into cylinder groove.

When doing this, hold piston in front of brake caliper.





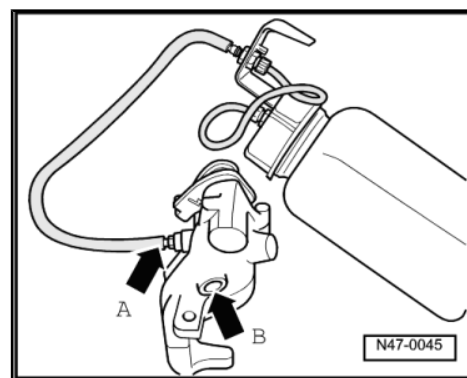
- Screw in piston by turning thumb wheel on piston compressing tool -T10165- clockwise. Do not damage protective cap.
- Use plate -T10165/1- for assistance when screwing in.
- ◆ Insert piston compressing tool -T10165- so that collar rests on plate -T10145/1- .
- ◆ If the piston is pushed back with a piston resetting appliance -T10145- or by operating the brake pedal, the automatic adjustment in the brake caliper is destroyed.



## 4.2 Pre-bleeding brake caliper

- Open bleeder valve -arrow A- and, using a commercially available bleeder bottle, fill with brake fluid until bubble-free brake fluid flows from threaded hole of brake hose connection -arrow B-. Close bleeder valve.

Position brake caliper as illustrated to pre-bleed.

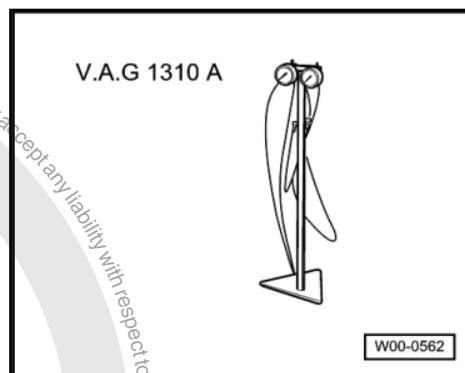




## 5 Pressurised leak test

### Special tools and workshop equipment required

- ◆ Tester for brake pressure regulator -V.A.G 1310 A-



- ◆ Adapter M10 -V.A.G 1310/6-

### 5.1 Test prerequisites:

Brake system (hydraulic unit, brake hoses, brake lines and brake calipers) operating properly and free of leaks.

- Remove bleeder valve at one of front brake calipers. Connect tester for brake pressure regulator -V.A.G 1310 A- and bleed.
- Apply pressure to brake pedal until gauge indicates a pressure of 50 bar. The pressure must not drop by more than 4 bar within the test period of 45 seconds. Renew brake master cylinder if drop in pressure exceeds specification.



## 6 Bleeding brake system using brake filling and bleeding equipment -VAS 5234- or -V.A.G 1869-

Bleeding the brake system is described for brake filling and bleeding equipment -VAS 5234- and -V.A.G 1869- .



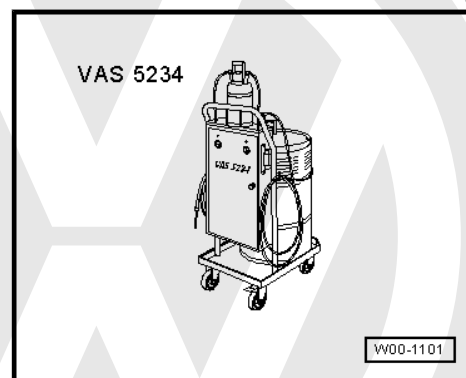
### Note

- ◆ *Bleeding brake system on vehicles with ABS is performed in same way as vehicles with a conventional brake system.*
- ◆ *Only use new brake fluid conforming to US standard FMVSS 116 DOT 4.*
- ◆ *Genuine VW/Audi brake fluid conforms to this specification.*
- ◆ *Brake fluid is poisonous. Also due to its corrosive effect brake fluid must not come into contact with paintwork.*
- ◆ *Brake fluid is hygroscopic, which means it absorbs moisture from the ambient air and should therefore always be stored in air tight containers.*
- ◆ *Wash away spilt brake fluid using plenty of water.*

**A pre-pressure of 2 bar is required for bleeding the hydraulic unit.**

### Special tools and workshop equipment required

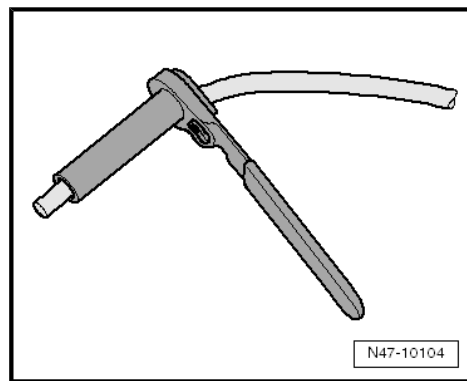
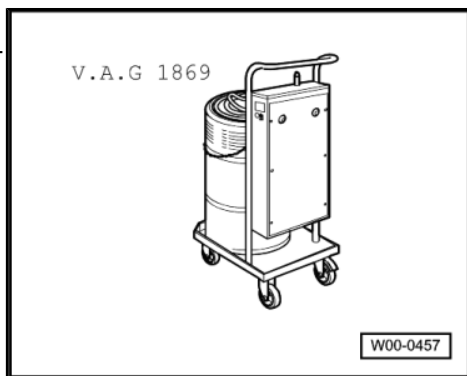
- ◆ Brake filling and bleeding equipment -VAS 5234-



or



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



- ◆ Upgrade kit and extraction unit -V.A.G 1869/4-

**Commercially available tool:**



**Note**

*If, in vehicles with ABS/ TCS or ABS/EDL/TCS/ ESP, a chamber in brake fluid reservoir is completely empty (e.g. brake system leaking), brake system must be pre-bled first ➔ [page 132](#) .*

- Remove rear wheels.

## 6.1 Pre-bleeding

- Connect brake filling and bleeding equipment -VAS 5234- or -V.A.G 1869- .

Bleeding sequence:

- 1 - Bleed front left and front right brake calipers simultaneously.
  - 2 - Bleed rear left and rear right brake calipers simultaneously.
- Leave bleeder valves open with brake fluid hoses connected until brake fluid free from air bubbles flows out.

The hydraulic unit must then be bled again via function “basic settings” with ➔ Vehicle diagnosis, testing and information system VAS 5051.

Initiate basic setting (to bleed brake system):

- Connecting -VAS 5051- and selecting functions ➔ [page 12](#) .
- Then bleed brake system as normal ➔ [page 132](#)

## 6.2 Bleeding (normal)

**Adhere strictly to work sequence when bleeding brake system.**

- Connect brake filling and bleeding equipment -VAS 5234- or -V.A.G 1869- .
- Open bleeder valves in specified order and bleed brake calipers.

- 1 - Front left brake caliper



- 2 - Front right brake caliper
- 3 - Rear left brake caliper
- 4 - Rear right brake caliper

**Use suitable bleeder hose. It must sit tightly on the bleeder valve so that no air can enter the brake system.**

- Leave bleeder valve of each brake caliper open with bleeder hose fitted until brake fluid discharges free of air bubbles.

### 6.3 Subsequent bleeding

This requires the assistance of a second mechanic:

- Depress brake pedal firmly and hold.
- Open bleeder valve on brake caliper.
- Fully depress brake pedal.
- Close bleed screw with pedal held down.
- Release brake pedal slowly.

**This bleed sequence must be carried out 5 times per brake caliper.**

Bleeding sequence:

- 1 - Front left brake caliper
- 2 - Front right brake caliper
- 3 - Rear left brake caliper
- 4 - Rear right brake caliper

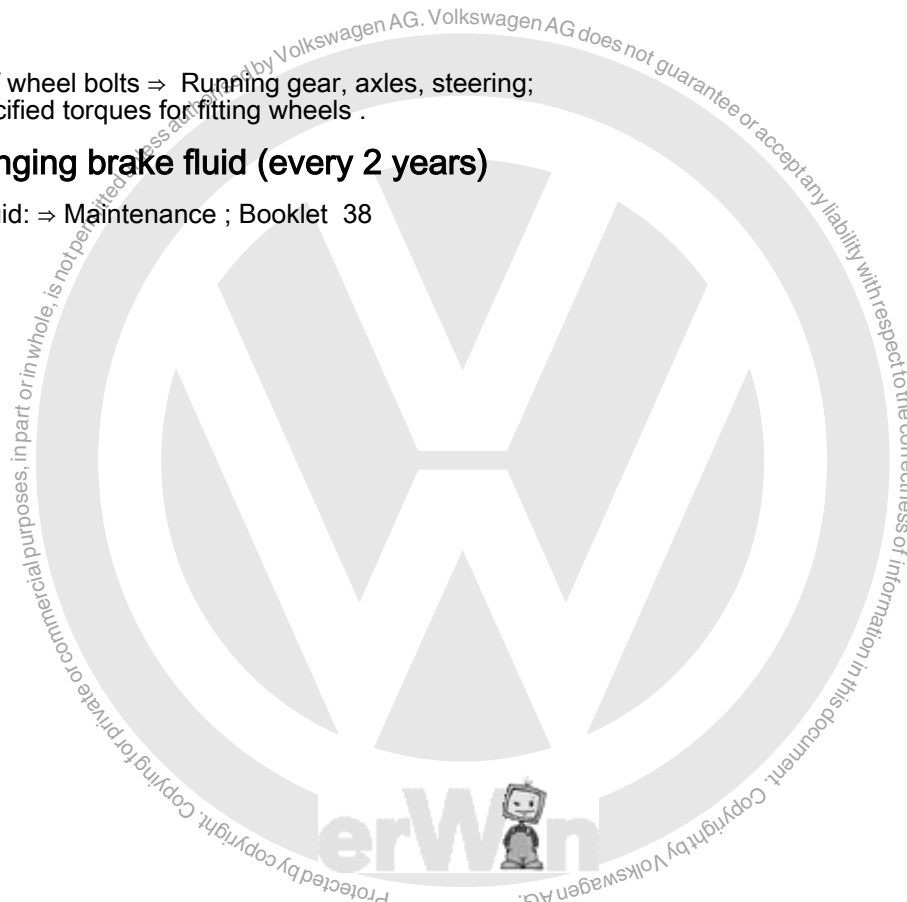
**A road test must be carried out after the brakes have been bled. When doing this an ABS regulation must be performed at least once!**

- Fit rear wheels.

Specified torque of wheel bolts ⇒ Running gear, axles, steering;  
Rep. Gr. 44 ; Specified torques for fitting wheels .

### 6.4 Changing brake fluid (every 2 years)

Changing brake fluid: ⇒ Maintenance ; Booklet 38





## 7 Brake servo and master brake cylinder

### 7.1 Assembly overview - brake servo/brake master cylinder (left-hand drive vehicle)



#### Note

Use only new brake fluid. Observe information on brake fluid reservoir!

#### 1 - Pedal cluster

- ❑ Various versions
- ❑ Allocation ⇒ Electronic parts catalogue "ETKA"

#### 2 - Hexagon nut

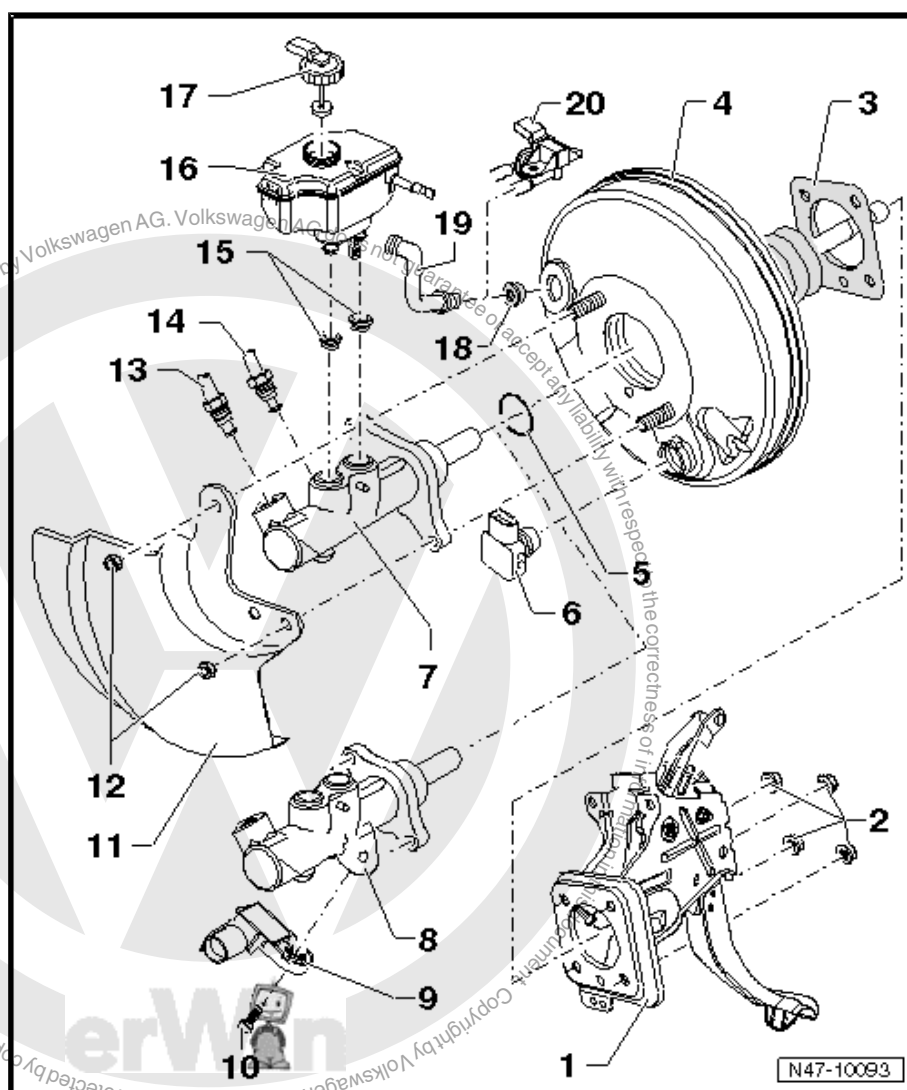
- ❑ 25 Nm
- ❑ Self-locking
- ❑ Always renew after re moving.

#### 3 - Seal

- ❑ For brake servo.

#### 4 - Brake servo

- ❑ On petrol engines, the required vacuum is taken from the intake manifold.
- ❑ Certain vehicles with a petrol engine and an automatic gearbox are equipped with a brake vacuum pump -V192- .  
⇒ [page 138](#)
- ❑ A vacuum sender is fitted in vehicles with HBV  
⇒ [page 58](#) .
- ❑ Diesel engines are fitted with a vacuum pump to create the required vacuum  
⇒ [page 137](#) .
- ❑ Functional check:
  - With engine switched off, depress brake pedal firmly several times. (This will release the vacuum in the unit.)



- Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.
- ❑ If faulty, renew as a complete unit.
- ❑ Removing and installing ⇒ [page 144](#) .



## 5 - Sealing ring

### 6 - Brake servo vacuum sender -G483-

- ☐ Only on vehicles having HBV
- ☐ Removing and installing ⇒ [page 58](#) .

### 7 - Brake master cylinder without brake light switch

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ Cannot be repaired. If faulty, renew as a complete unit.
- ☐ Removing and installing ⇒ [page 141](#) .

### 8 - Brake master cylinder with brake light switch

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ Cannot be repaired. If faulty, renew as a complete unit.
- ☐ Removing and installing ⇒ [page 141](#) .

### 9 - Brake light switch -F-

- ☐ Including brake pedal switch -F47- .
- ☐ In vehicles prior to week 50/2005, the brake light switch -F- is located on the brake pedal ⇒ [page 109](#) .
- ☐ Removing and installing ⇒ [page 139](#) .

### 10 - Torx bolt

- ☐ 5 Nm

### 11 - Heat shield

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

### 12 - Hexagon nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew after removing.

### 13 - Brake line

- ☐ 14 Nm
- ☐ From secondary piston circuit of brake master cylinder to hydraulic unit

### 14 - Brake line

- ☐ 14 Nm
- ☐ From primary piston circuit of brake master cylinder to hydraulic unit

### 15 - Sealing plug

- ☐ Moisten with brake fluid and press into brake fluid reservoir

### 16 - Brake fluid reservoir

### 17 - Cap

### 18 - Sealing plug

- ☐ Connection for vacuum hose

### 19 - Vacuum hose

- ☐ Fit in brake servo

### 20 - Brake servo pressure sensor -G294-

- ☐ In vehicles with an FSI engine without HBV (hydraulic brake with vacuum servo)
- ☐ Removing and installing ⇒ [page 138](#) .



## 7.2 Assembly overview - brake servo/brake master cylinder (right-hand drive vehicle)



### Note

Use only new brake fluid. Observe information on brake fluid reservoir!

#### 1 - Pedal cluster

#### 2 - Bolt

- ☐ 25 Nm

#### 3 - Hexagon nut

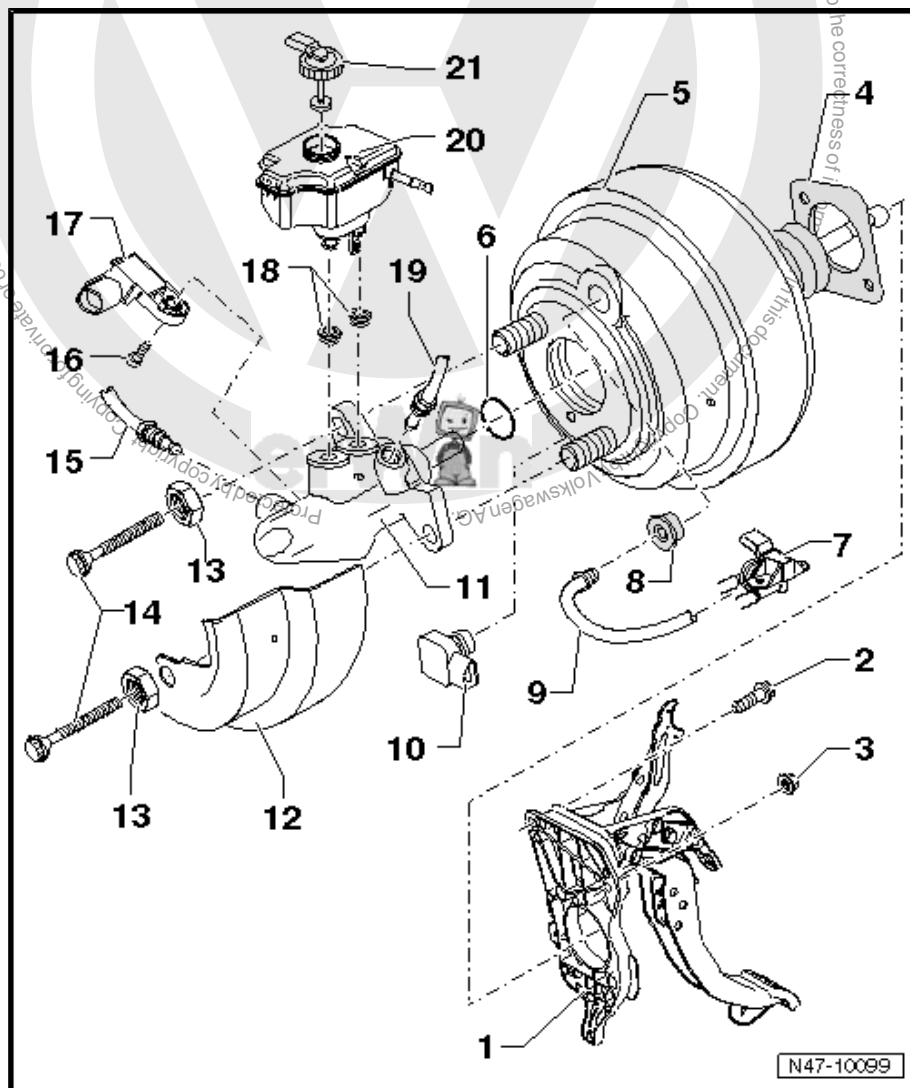
- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew after removing.

#### 4 - Seal

- ☐ For brake servo.

#### 5 - Brake servo

- ☐ On petrol engines, the required vacuum is taken from the intake manifold.
- ☐ Certain vehicles with a petrol engine and an automatic gearbox are equipped with a brake vacuum pump -V192-.
- ☐ A vacuum sender is fitted in vehicles with HBV ⇒ [page 58](#).
- ☐ Diesel engines are fitted with a vacuum pump to create the required vacuum ⇒ [page 137](#).
- ☐ Functional check:
  - With engine switched off, depress brake pedal firmly several times. (This will release the vacuum in the unit.)



- Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.

- ☐ If faulty renew complete (check all vacuum lines first).

- ☐ Removing and installing ⇒ [page 144](#).

#### 6 - Sealing ring

#### 7 - Brake servo pressure sensor -G294-

- ☐ In vehicles with an FSI engine without HBV (hydraulic brake with vacuum servo)
- ☐ Removing and installing ⇒ [page 138](#).

#### 8 - Sealing plug

- ☐ Connection for vacuum hose



## 9 - Vacuum hose

- ☐ Fit in brake servo

## 10 - Brake servo vacuum sender -G483-

- ☐ Only on vehicles having HBV
- ☐ Removing and installing ⇒ [page 58](#) .

## 11 - Brake master cylinder

- ☐ With brake light switch -F- from week 50/2005
- ☐ In vehicles prior to week 50/2005, the brake light switch -F- is located on the brake pedal ⇒ [page 109](#) .
- ☐ Allocation ⇒ Electronic Parts Catalogue (ETKA) .
- ☐ Cannot be repaired. If faulty, renew as a complete unit.
- ☐ Removing and installing ⇒ [page 141](#) .

## 12 - Heat shield

### 13 - Nut

- ☐ 50 Nm

### 14 - Bolt

- ☐ 25 Nm

### 15 - Brake line

- ☐ 14 Nm
- ☐ From secondary piston circuit of brake master cylinder to hydraulic unit

### 16 - Bolt

- ☐ 5 Nm

### 17 - Brake light switch -F-

- ☐ Including brake pedal switch -F47- .
- ☐ In vehicles prior to week 50/2005, the brake light switch -F- is located on the brake pedal ⇒ [page 109](#) .
- ☐ Removing and installing ⇒ [page 139](#) .

### 18 - Sealing plug

- ☐ Moisten with brake fluid and press into brake fluid reservoir.

### 19 - Brake line

- ☐ 14 Nm
- ☐ From primary piston circuit of brake master cylinder to hydraulic unit

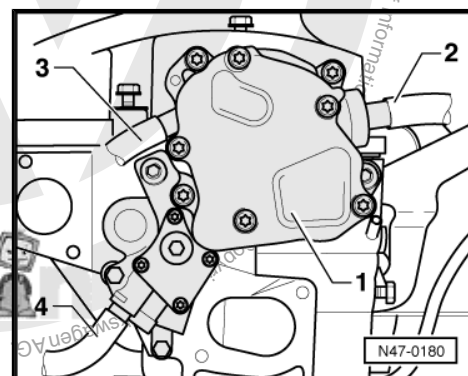
### 20 - Brake fluid reservoir

### 21 - Cap

## 7.3 Overview - vacuum pump for brake servo (diesel vehicles)

### Exhauster pump for 4-cylinder diesel engine (2-valve):

- 1 - Tandem pump (vacuum pump and fuel pump)
  - 2 - Vacuum hose to brake servo with non-return valve.
  - 3 - Supply hose
  - 4 - Return hose
- Removing and installing tandem pump ⇒ Rep. Gr. 20 ; Removing and installing parts of fuel supply system .





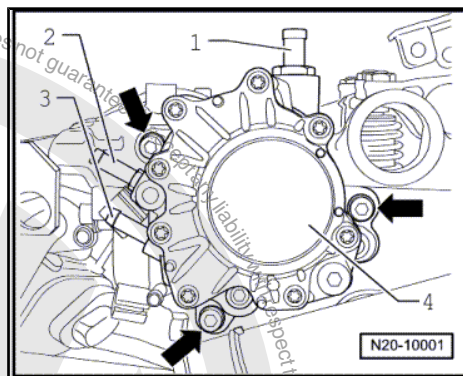
### Exhauster pump for 4-cylinder diesel engine (4-valve).

Tandem pump -4- (vacuum pump and fuel pump)

Vacuum hose to brake servo -1- with non-return valve.

Fuel lines -2- and -3-.

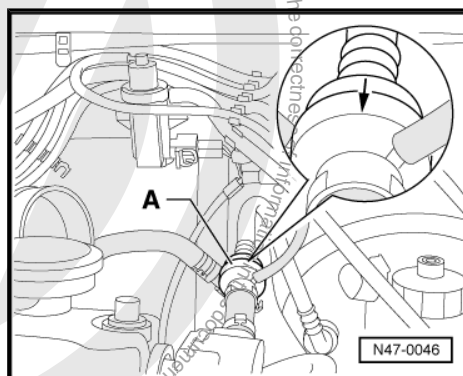
- Removing and installing tandem pump ⇒ Rep. Gr. 20 ; Removing and installing parts of fuel supply system .



## 7.4 Checking non-return valve :

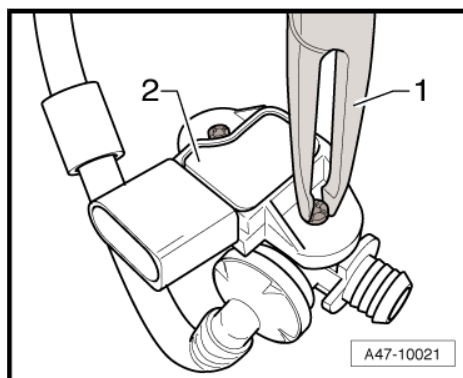
- ♦ Air must pass through non-return valve -A- in -direction of arrow-.
- ♦ Non-return valve must remain closed in opposite direction.

Observe correct installation position!



## 7.5 Removing and installing brake servo pressure sensor -G294-

- Remove engine cover panel.
- Pull vacuum hose together with brake servo pressure sensor -G294- out of brake servo.
- Release clips with pliers -1-.
- Carefully lever off brake servo pressure sensor -G294- -2-.



## 7.6 Vacuum pump for brakes -V192-

Location for vacuum pump for brakes -V192- is on automatic gearbox at front in direction of travel.

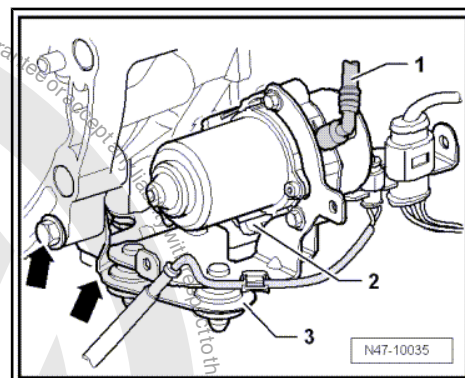
No provision is made for repairs to vacuum pump for brakes -V192- . If a fault occurs, the vacuum pump for brakes -V192- must be renewed.

Can be tested in "Guided fault finding" using -VAS 5051- .



## Removing

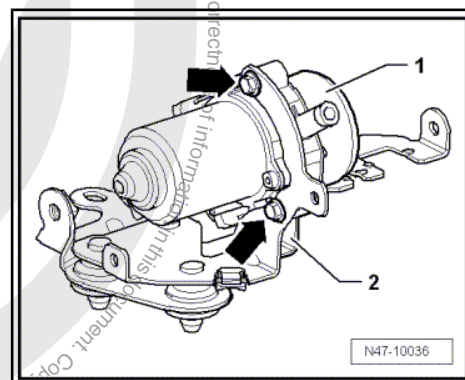
- Pull vacuum hose -1- off vacuum pump for brakes -V192- .
- Disconnect connector -2- for vacuum pump for brakes -V192- .
- Remove remaining connectors and lines from bracket -3-.
- Unscrew -arrows- bracket -3- together with vacuum pump for brakes -V192- .



- Then unscrew -arrows- vacuum pump for brakes -V192- -1- from bracket -2-.

## Installing

Install in reverse order.



## Specified torques

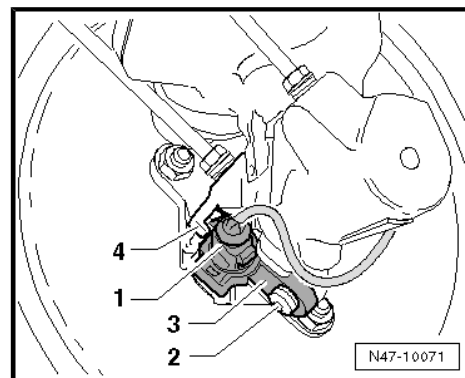
Component	Specified torque
Brake vacuum pump -V192- to bracket	8 Nm
Bracket to automatic gearbox	25 Nm

## 7.7 Removing and installing brake light switch -F- as of week 50/05

In vehicles prior to week 50/2005, the brake light switch is located on brake pedal ➔ [page 111](#) .

### Removing

- Remove engine cover panel.
- In certain vehicles, the intake hose must be removed.
- Separate connector -1- from brake light switch -F- .
- Remove bolt -2- from brake master cylinder.
- Pull brake light switch -F- -3- from brake master cylinder at bottom and remove from locking lug at top -4-.



### Installing

- Install in reverse order.



### Specified torque

Component	Specified torque
Torx bolt on brake master cylinder	5 Nm

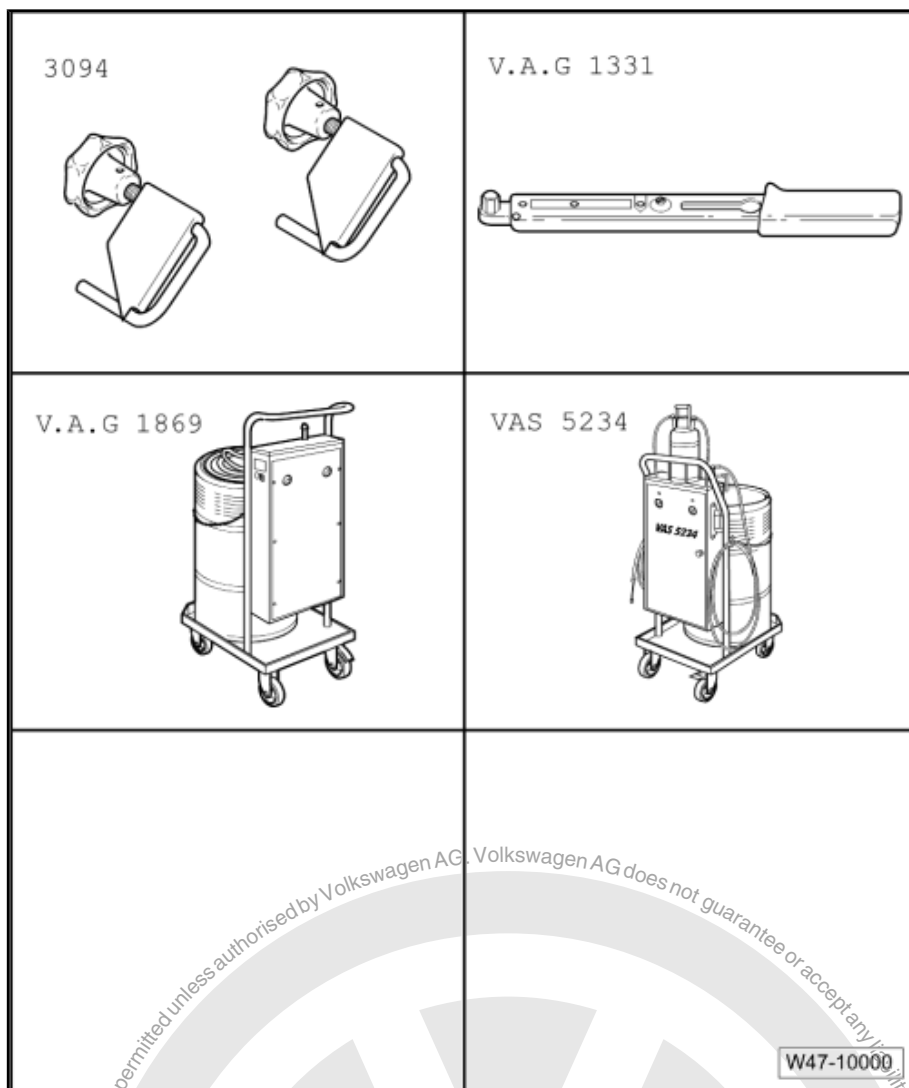




## 8 Removing and installing brake master cylinder

### Special tools and workshop equipment required

- ◆ Hose clamps -3094-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Brake filling and bleeding equipment -V.A.G 1869-
- ◆ Upgrade kit and extraction unit -V.A.G 1869/4-
- ◆ Brake filling and bleeding equipment -VAS 5234-



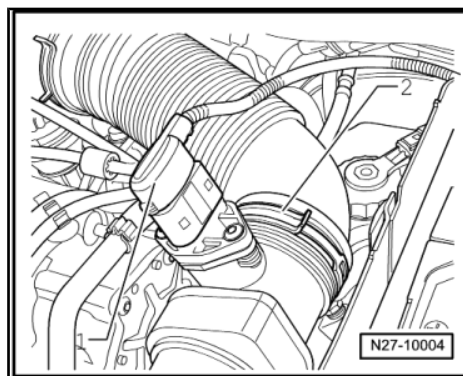
### Removing

- Note or request radio code on vehicles with coded radio if necessary.
- Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

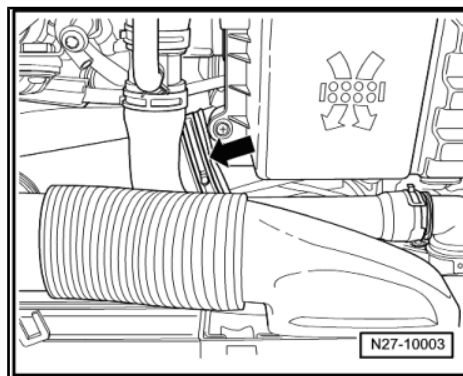


### Vehicles with diesel engine

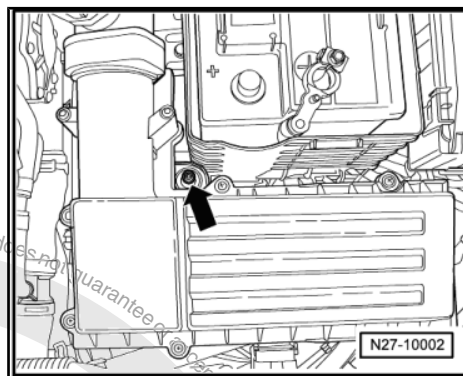
- Disconnect wiring connector -1- and loosen rear spring-type clip on intake hose.



- Loosen spring-type clip -arrow- and pull hose off air cleaner housing



- Remove securing bolt from air cleaner housing -arrow-.
- Pull air filter housing upwards out of brackets and remove it.



### Continuation for all vehicles

- Removing and installing battery.⇒ Electrical system; Rep. Gr. 27
- Remove battery tray.
- Place sufficient lint-free cloths in area of engine and gearbox.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment -VAS 5234- or extraction unit -V.A.G 1869/4- .

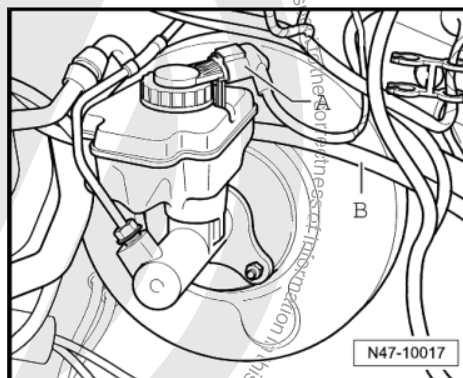
### Vehicles with manual gearboxes

- Clamp clutch master cylinder supply hose -B- with special tool 3094.
- Detach supply hose -B- for clutch master cylinder.

### Continuation for all vehicles

- Pull connector -A- off float warning indicator sender.

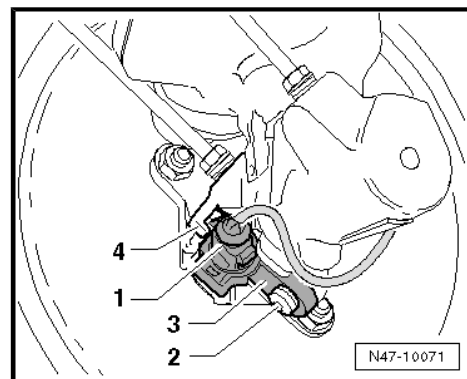
### Vehicles with brake light switch -F- on brake master cylinder



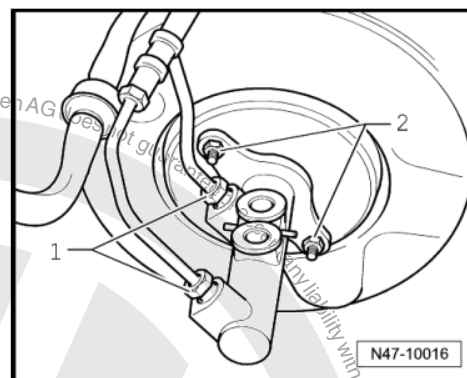


- Separate connector -1- from brake light switch -F- .

#### Continuation for all vehicles



- Remove brake fluid reservoir. To do this press locking tabs on reservoir outwards and simultaneously pull brake fluid reservoir out of sealing plugs.
- Disconnect brake lines -1- from brake master cylinder and seal brake lines using sealing plugs -1H0 698 311 A- .
- Remove nuts -2- from brake master cylinder.
- Remove heat shield (if installed).
- Carefully take brake master cylinder out of brake servo.



#### Installing

- Install in reverse order.

Observe the following important points when installing:

- When assembling brake master cylinder with brake servo, make sure plunger rod is properly positioned in brake master cylinder.
- Connect battery ⇒ Electrical system; Rep. Gr. 27 .
- Bleed brake system ⇒ [page 131](#) .

#### Specified torques

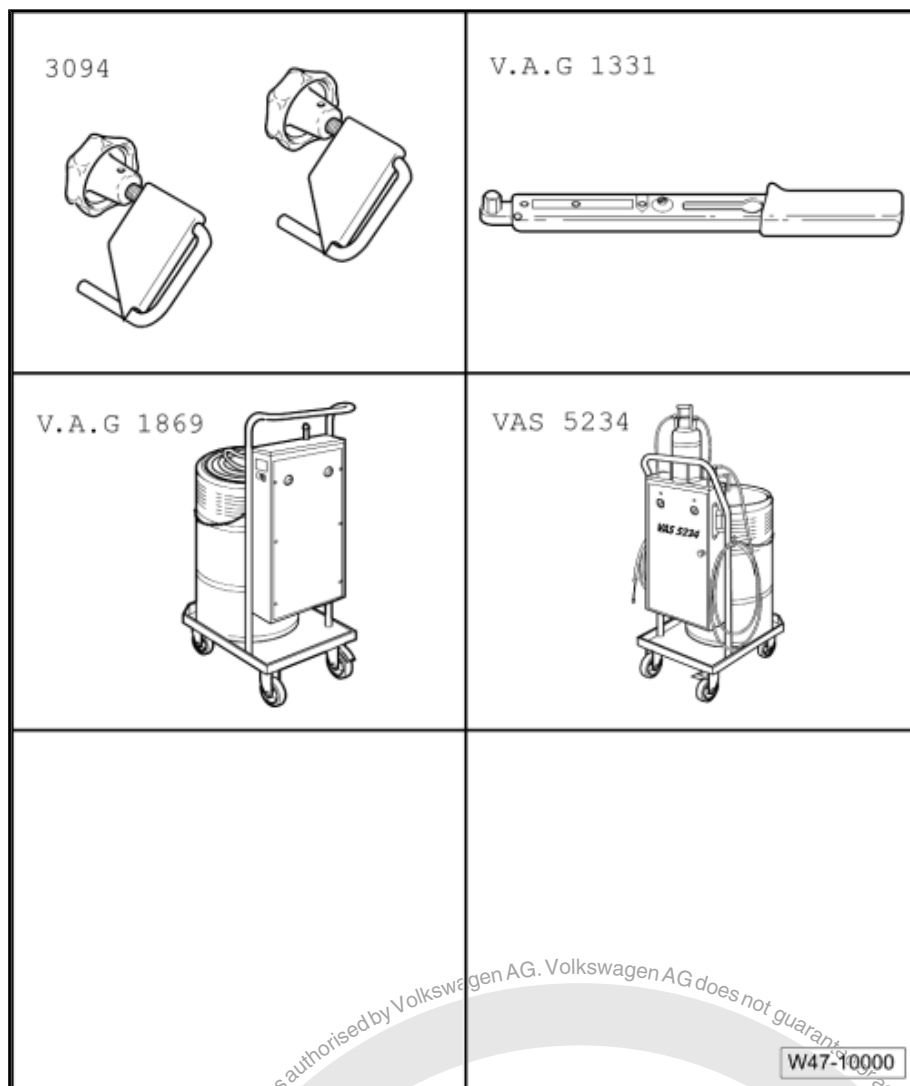
Component	Specified torque
Brake master cylinder to brake servo ♦ Use new nuts!	25 Nm
Brake lines to brake master cylinder	14 Nm
Battery retainer to body	20 Nm



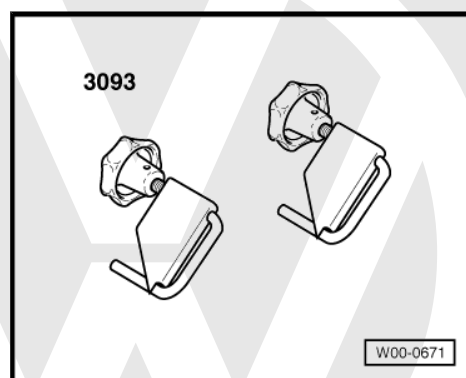
## 9 Removing and installing brake servo

### Special tools and workshop equipment required

- ◆ Hose clamps -3094-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Brake filling and bleeding equipment -V.A.G 1869-
- ◆ Upgrade kit and extraction unit -V.A.G 1869/4-
- ◆ Brake filling and bleeding equipment -VAS 5234-



- ◆ Hose clamps -3093-



### 9.1 Removing

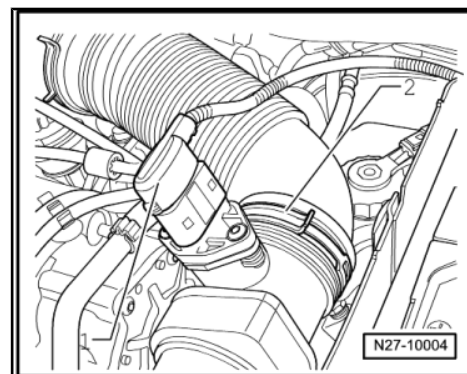
- Note or request radio code on vehicles with coded radio if necessary.



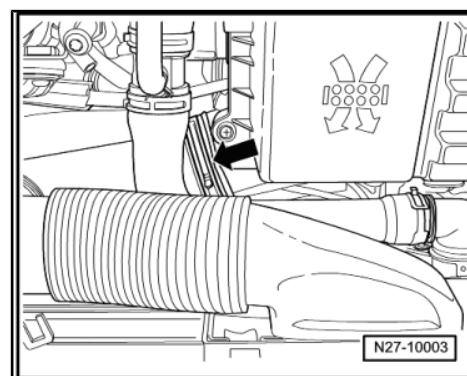
- Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

#### Vehicles with diesel engine

- Disconnect wiring connector -1- and loosen rear spring-type clip on intake hose.



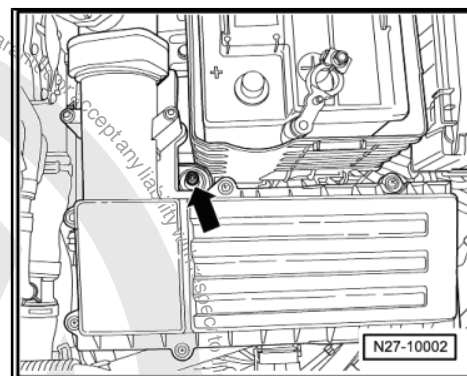
- Loosen spring-type clip -arrow- and pull hose off air cleaner housing



- Remove securing bolt from air cleaner housing -arrow-.
- Pull air filter housing upwards out of brackets and remove it.

#### Continuation for all vehicles

- Removing and installing battery.⇒ Electrical system; Rep. Gr. 27
- Remove battery tray.
- Place sufficient lint-free cloths in area of engine and gearbox.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment -VAS 5234- or extraction unit -V.A.G 1869/4- .



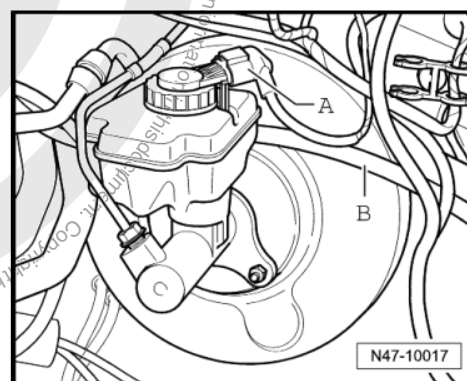
#### Vehicles with manual gearboxes

- Clamp clutch master cylinder supply hose -B- with special tool 3094.
- Detach supply hose -B- for clutch master cylinder.

#### Continuation for all vehicles

- Pull connector -A- off float warning indicator sender.

#### Vehicles with brake light switch -F- on brake master cylinder





- Separate connector -1- from brake light switch -F- .

#### Continuation for all vehicles

- Remove brake fluid reservoir. To do this press locking tabs on reservoir outwards and simultaneously pull brake fluid reservoir out of sealing plugs.
- Disconnect brake lines -1- from brake master cylinder and seal brake lines using sealing plugs -1H0 698 311 A- .
- Remove nuts -2- from brake master cylinder.
- Remove heat shield (if installed).
- Carefully take brake master cylinder out of brake servo.
- Pull vacuum hose out of brake servo.

#### Vehicles with manual gearboxes

- Release cable -1-, unbolt support bracket -2- and place it to side ⇒ Rep. Gr. 34 ; Repairing selector mechanism .

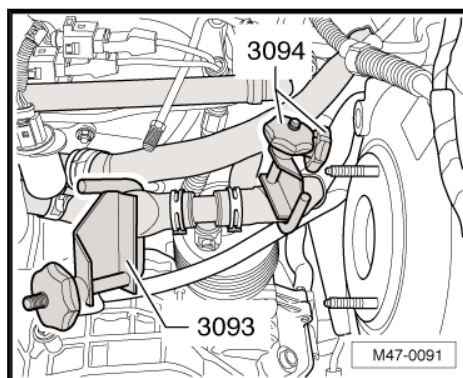
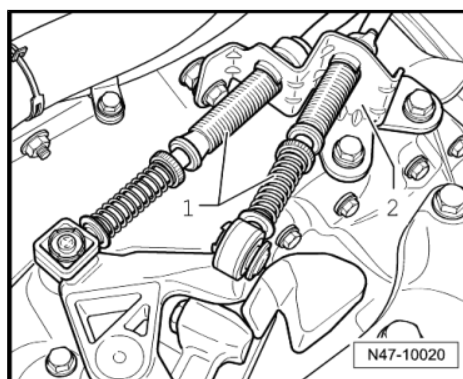
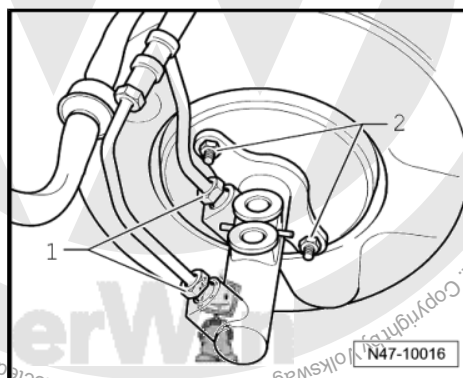
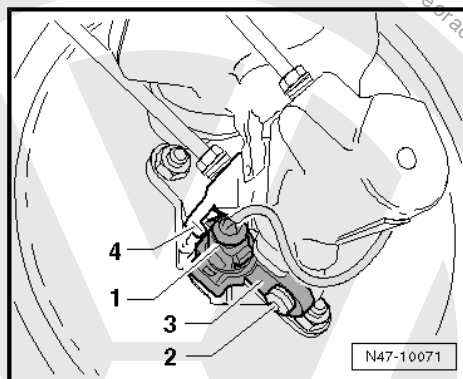
#### Vehicles with automatic gearbox

- Clamp coolant line on automatic gearbox radiator with hose clamp -3093- and two hose clamps -3094- and remove from automatic gearbox radiator.

#### Continuation for all vehicles

- Remove driver side footwell cover ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .

#### Vehicles with brake light switch -F- on brake pedal

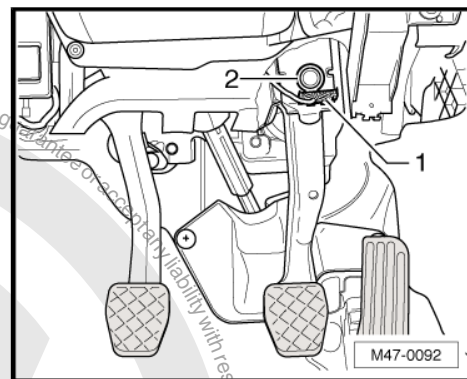




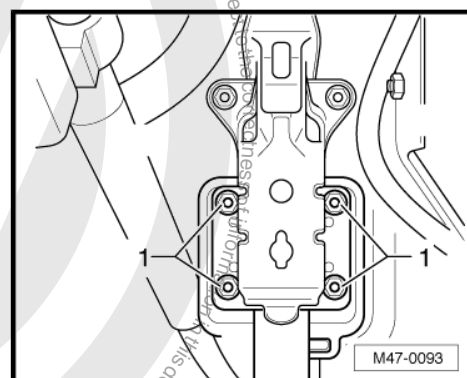
- Pull connector -1- off brake light switch.
- Remove brake light switch -2- by turning 45° to left.

#### Continuation for all vehicles

- Separate brake pedal from brake servo ➔ [page 110](#) .



- Unscrew nuts -1- from brake servo.
- Carefully remove brake servo from vehicle.



## 9.2 Installing

- Install in reverse order.

Observe following points when installing:

- Clip brake pedal to brake servo ➔ [page 110](#) .
- Connect battery ➔ Electrical system; Rep. Gr. 27 .
- After installing, bleed brakes ➔ [page 131](#) and clutch ➔ Rep. Gr. 34 .
- Adjust brake light switch ➔ [page 111](#) .

#### Specified torques

Component	Specified torque
Brake servo to pedal cluster and bulkhead ◆ Use new nuts!	25 Nm
Brake master cylinder to brake servo ◆ Use new nuts!	25 Nm
Brake lines to brake master cylinder	14 Nm
Battery retainer to body	20 Nm



## 10 Repairing brake lines

The flanging tool for brake lines -VAS 6056- can be used to flange brake lines with an outer pipe diameter of 5 mm without damaging the coating. In certain cases, this allows sections of brake lines to be renewed at less expense.

The use of flanging tool -V.A.G 1356- is not permitted due to the coating and the diameter of the black brake lines.

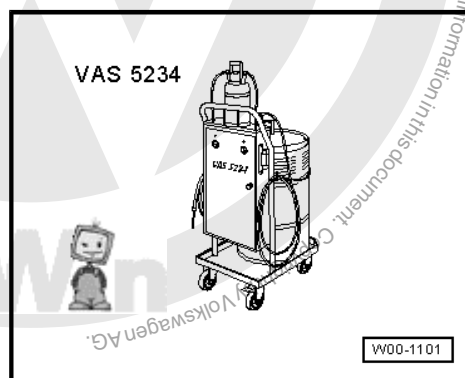
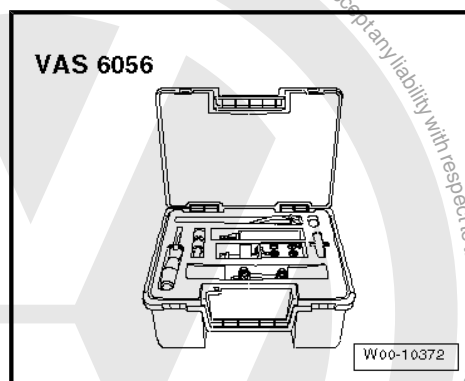


### Note

- ◆ *Brake lines may only be bent to max. 90°, as they otherwise kink or display deformations which constrict the cross-section of the line to an impermissible degree.*
- ◆ *Preferably separate brake lines at vehicle floor.*
- ◆ *The positions of the intermediate pieces must be selected so that they cannot chafe on moving parts.*
- ◆ *Do not grease spindle; merely clean with methylated spirits.*

### Special tools and workshop equipment required

- ◆ Flanging tool for brake lines -VAS 6056-
- ◆ Brake filling and bleeding equipment -VAS 5234-



### List of individual tools:



**1 - Flanging tool -VAS 6056/1-**

- ❑ The flanging tool -VAS 6056/1- contains flanging jaws -VAS 6056/6- .

**2 - Pipe cutter -VAS 6056/2-**

**3 - Brake line scraper -VAS 6056/3-**

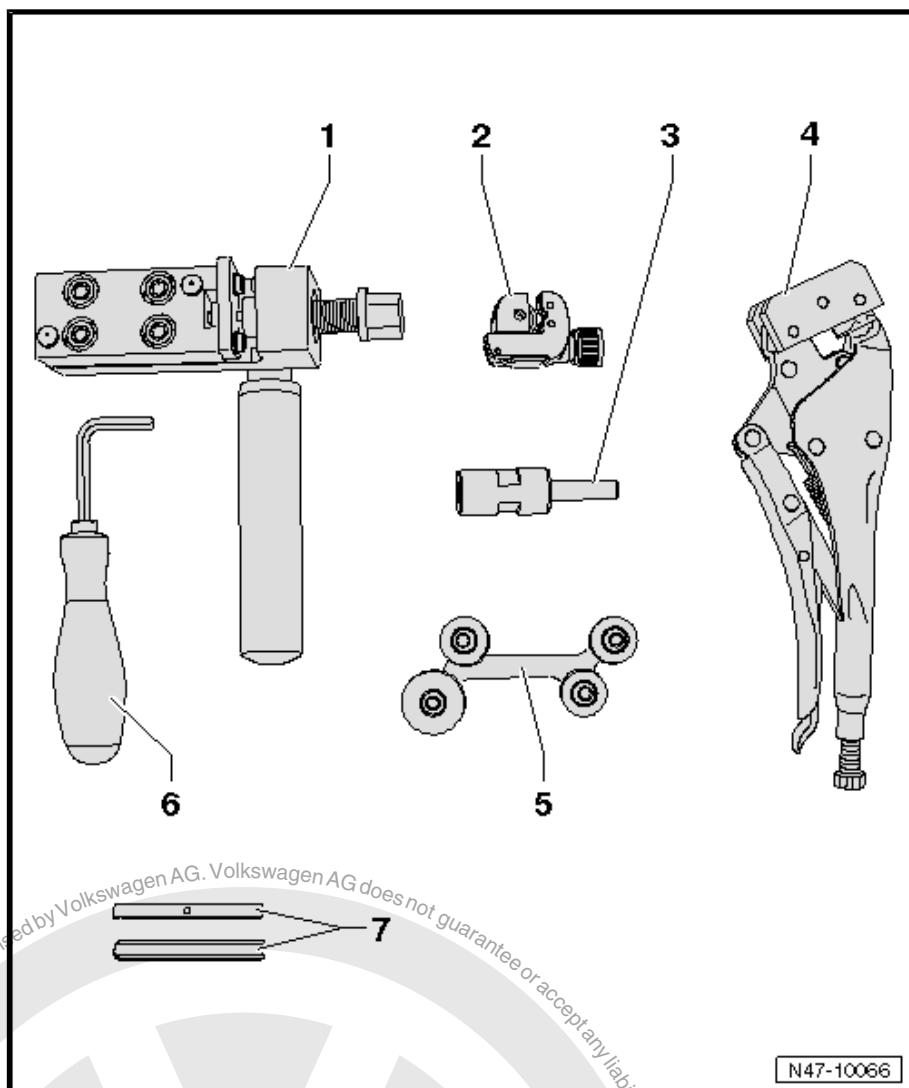
- ❑ Grub screws (in shaft and at side) are adjusted and must not be readjusted!

**4 - Set of grips with plastic jaws -VAS 6056/4-**

**5 - Pipe bending tool -VAS 6056/5-**

**6 - Special wrench, 6 mm**

**7 - Flanging jaws -VAS 6056/7-**



N47-10066



## 10.1 Assembly overview - flanging tool

### 1 - Flanging tool upper part

- ☐ Unbolt to change flanging jaws .

### 2 - Fastening for handle

- ☐ Must be removed to access retaining screw for upper part

### 3 - Retaining screw

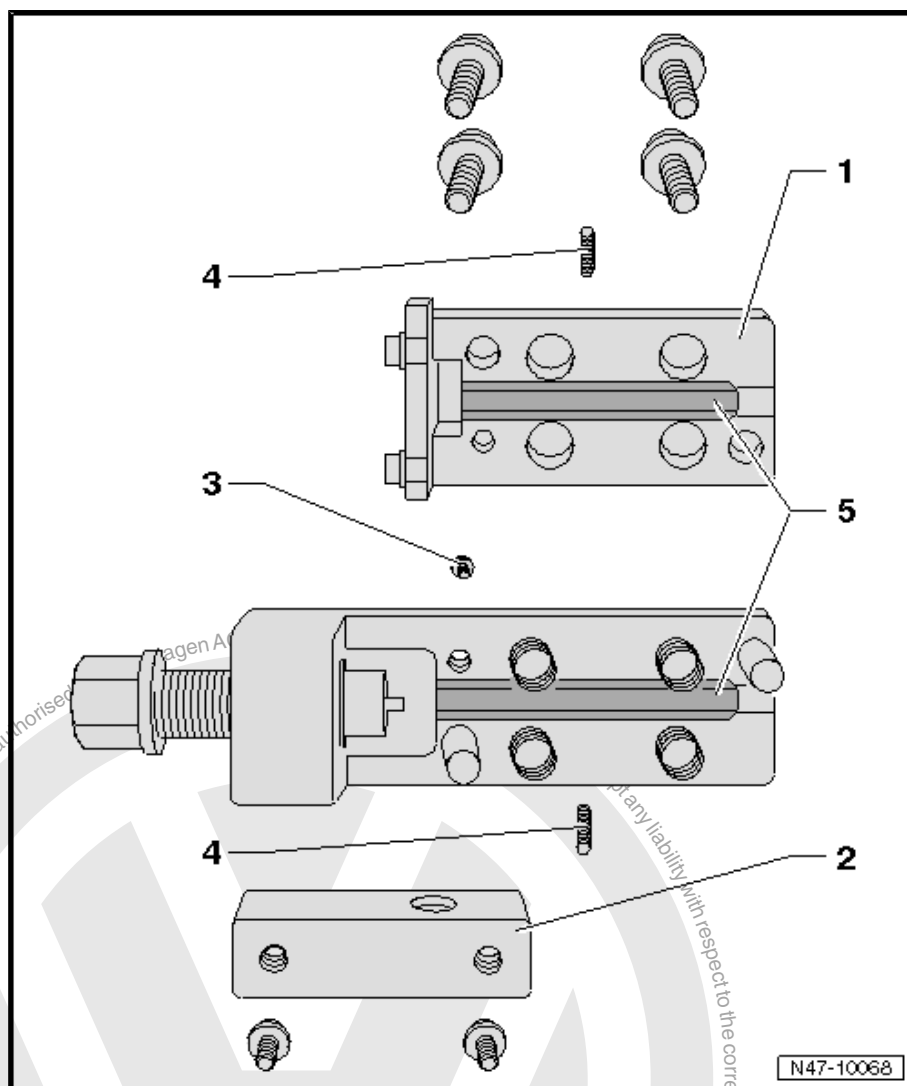
- ☐ For flanging tool upper part

### 4 - Grub screws for flanging jaws

- ☐ Centring and holding flanging jaws .
- ☐ Hexagon socket head bolt, 2 mm

### 5 - Flanging jaws

- ☐ Various
- ☐ Assembly instructions  
⇒ [page 150](#)



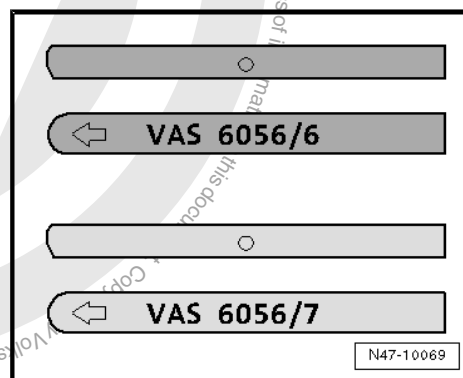
### Flanging jaw assembly instructions:

- ◆ -VAS 6056/6- (dark) for black brake lines
- ◆ -VAS 6056/7- (light) for green brake lines



#### Note

*The arrow on the rounded side of the flanging jaws must point to the edge of the housing, and the straight side of the flanging jaws must be installed towards the spindle, or the flange will not be formed correctly.*

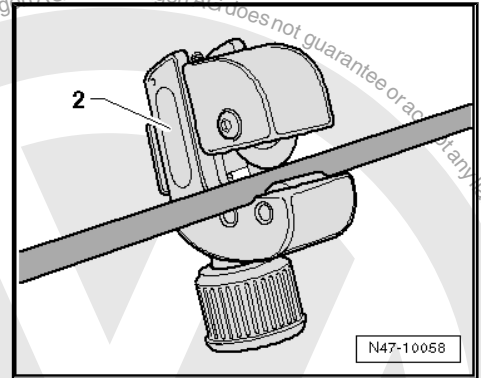


## 10.2 Work instructions

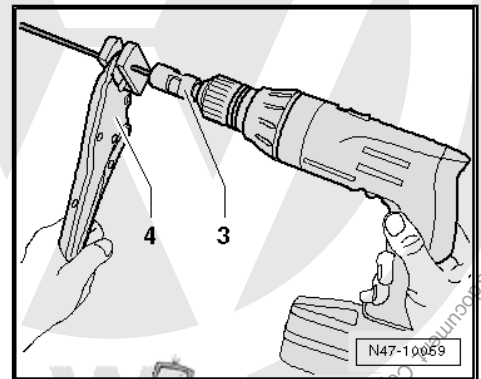
- Unbolt relevant brake line at brake caliper or wheel brake cylinder; catch escaping brake fluid and dispose of this as per regulations.



- Cut through brake line at a suitable point (straight, freely accessible section) with pipe cutter -2-.
- Remove section to be renewed.
- Degrease brake line surface.



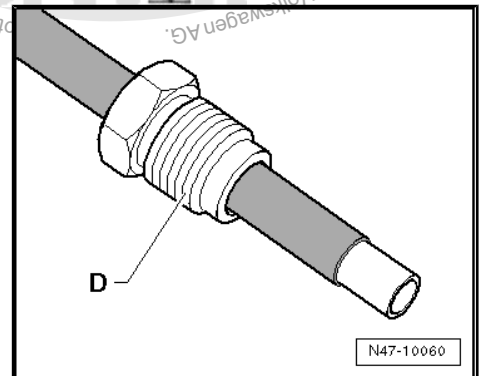
- Clamp brake line tightly in set of grips -4- so that approx. 50 mm project from plastic jaws.
- Clamp scraper -3- into a drill and position onto brake line.
- At slow drill speed and with gentle pressure on brake line, scrape coating off brake line.



#### Note

*Length of scraping is determined by stop in scraper.*

- Withdraw scraper from brake line and remove residue from scraping.
- Remove set of grips and slide union bolt -D- onto brake line.



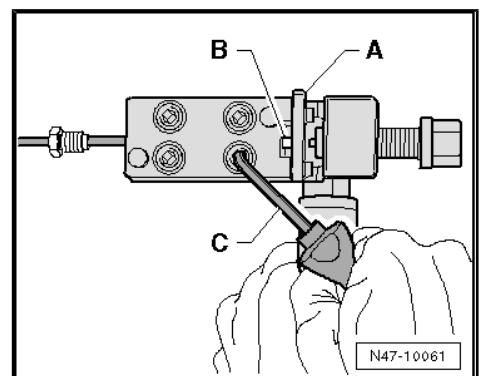
- Slide brake line -B- up to stop -A- in flanging tool.



#### Note

*Brake line must be positioned against stop when the hexagon socket head bolts are tightened, or the flange will not be formed correctly.*

- Tighten brake line in flanging tool until brake line can no longer be moved. Fold up stop -A- and now tighten hexagon socket head bolts diagonally using special wrench -C-.





- Turn spindle to stop in flanging tool.
- 2
- Turn spindle back again.
- Loosen hexagon socket head bolts diagonally.
- Remove brake line from flanging tool, clean and check brake line and flange.

Briefly flush the section of brake line remaining in the vehicle:

- Connect brake filling and bleeding unit -VAS 5234- , connect bleeder bottle hose to brake line flange and allow brake filling and bleeding unit -VAS 5234- to run briefly until a little brake fluid has run through.
- Blow out new brake line to be inserted with compressed air.
- Join brake lines using connector -E-.
- Install brake line.
- Bleed brake system ➔ [page 131](#) .

