Workshop Manual

Eos 2006 ➤
Golf 2004 ➤
Golf Plus 2005 ➤
Touran 2003 ➤

Brake systems

Edition 05.2008

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Repair Group

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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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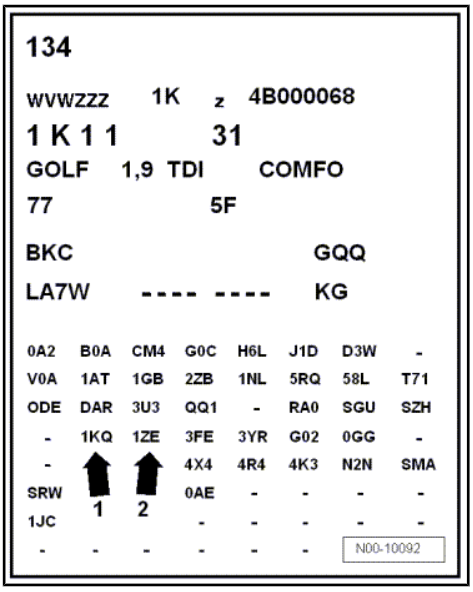
Contents

00 – Technical data

1 Brake allocation via PR No.

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 vehicle is equipped with the following brakes:

- Arrow 1 - Rear brakes -1KQ
- Arrow 2 - Front brakes -1ZE

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

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

1.1 Front brakes, Touran

Engine	PR No.	Front brake
1.6 l - 75 kW	1ZE	FN3 (15”)
1.6 l - 85 kW FSI		
1.4 l - 103 kW FSI		
2.0 l -110 kW FSI		
1.9 l - 66 kW TDI		
1.9 l - 74, 77 kW TDI		
2.0 l - 100, 103 kW TDI		
1.4 l -125 kW FSI	1LJ	FN3 (16”)
2.0 l - 125 kW TDI		

Country-specific brake for Japan:

Engine	PR No.	Front brake
1.6 l - 85 kW FSI	1ZP	FN3 (15”)
2.0 l -110 kW		

1.2 Front brakes, Golf

Engine	PR No.	Front brake
1.4 l - 55, 59 kW	1ZF[1] / 1ZM	FS III (15”)
1.4 l -66 kW FSI		
1.6 l - 75 kW		
1.6 l - 85 kW FSI[2]		
2.0 l - 85 kW		
1.9 l - 66 kW TDI		

1.9 l - 77 kW TDI [3]		
2.0 l -55 kW SDI		
1.6 l - 85 kW FSI[4]	1ZE	FN3 (15”)
1.4 l - 88, 90 kW FSI		
1.4 l - 103, 110 kW FSI		
2.0 l -110 kW FSI		
1.9 l - 77 kW TDI [5]		
2.0 l - 100, 103 kW TDI		
2.0 l -147 kW FSI	1LJ / 1LL	FN3 (16”)
1.4 l -125 kW FSI	1LJ	
2.0 l - 125 kW TDI		
3.2 l -184 kW	1LM	FNR-G (17”)

[1] the 1ZE brake was installed at the start of series production.

[2] Golf

[3] with 5-speed manual gearbox 0A4.

[4] Golf Plus

[5] with Direct Shift Gearbox 02E - 6-speed or four-wheel drive.

Country specific brake for North America / Japan:

Engine	PR No.	Front brake
1.6 l -75 kW	1ZP	FN3 (15”)
1.6 l - 85 kW FSI		
2.0 l -110 kW		
2.5 l -110 kW		
1.9 l - 74 kW TDI		
2.0 l -147 kW FSI	1ZD / 1LV	FN3 (16”)

1.3 Front brakes, Eos

Engine	PR No.	Front brake
1.6 l - 85 kW FSI	1ZE	FN3 (15”)
2.0 l -110 kW FSI		
2.0 l -147 kW FSI	1LJ	FN3 (16”)
2.0 l - 100, 103 kW TDI		
3.2 l -184 kW		

Country specific brake for North America / Japan:

Engine	PR No.	Front brake
2.0 l -147 kW FSI	1ZD	FN3 (16”)
3.2 l -184 kW		

1.4 Rear brakes, Touran

Engine	PR No.	Rear brake
1.6 l - 75 kW	1KF	CII 41 (15”)
1.6 l - 85 kW FSI		
1.4 l -103 kW FSI		
2.0 l -110 kW FSI		
1.9 l - 66 kW TDI		

1.9 l - 74, 77 kW TDI		
2.0 l - 100, 103 kW TDI		
1.4 l -125 kW FSI	1KJ [1]	CII 41 (16”)
2.0 l - 125 kW TDI		

[1] Gradual switch to 1KF from the end of 2006

Country-specific brake for Japan:

Engine	PR No.	Rear brake
1.6 l - 85 kW FSI	1KE	CII 41 (15”)
2.0 l -110 kW		

1.5 Rear brakes, front-wheel drive Golf

Without Golf Variant:

Engine	PR No.	Rear brake
1.4 l - 55, 59 kW	1KQ / 1KD	CI 38 (15”)
1.4 l - 66 kW FSI		
1.6 l - 75 kW		
1.6 l - 85 kW FSI		
2.0 l - 85 kW		
1.4 l - 88, 90 kW FSI		
1.4 l - 103, 110 kW FSI		
2.0 l -110 kW FSI		
2.0 l - 55 kW SDI		
1.9 l - 66 kW TDI		
1.9 l - 77 kW TDI		
2.0 l - 100, 103 kW TDI		
2.0 l - 147 kW FSI	1KY	CII 38 (16”)
1.4 l - 125 kW FSI	1KZ [1]	
2.0 l - 125 kW TDI		

[1] Gradual switch to 1KD from the end of 2006

Golf Variant only:

Engine	PR No.	Rear brake
1.6 l - 75 kW	1KF	CII 41 (15”)
1.6 l - 85 kW FSI		
2.0 l - 110 kW FSI		
1.9 l - 74, 77 kW TDI		
2.0 l - 100, 103 kW TDI		

Country specific brake for North America / Japan:

Engine	PR No.	Rear brake
1.6 l - 75 kW	1KE	CII 41 (15”)
1.6 l - 85 kW FSI		
2.0 l -110 kW		
2.5 l - 110 kW		
2.0 l - 147 kW FSI		
1.9 l - 77 kW TDI		
2.0 l - 100, 103 kW TDI		

2.0 l - 147 kW FSI	1KV	CII 38 (16”)

1.6 Rear brakes, four-wheel drive Golf

Engine	PR No.	Rear brake
2.0 l - 110 kW FSI	1KF	CII 41 (15”)
1.9 l - 77 kW TDI		
2.0 l - 100, 103 kW TDI		
3.2 l - 184 kW	2EL	CII 41 (17”)

Country-specific brake for Japan:

Engine	PR No.	Rear brake
2.0 l - 110 kW	1KE	CII 41 (15”)

1.7 Rear brakes, Eos

Engine	PR No.	Rear brake
1.6 l - 85 kW FSI	1KD	CI 38 (15”)
2.0 l - 110 kW FSI		
2.0 l - 100, 103 kW TDI		
2.0 l - 147 kW FSI	1KZ	CII 38 (16”)
3.2 l - 184 kW		

Country specific brake for North America / Japan:

Engine	PR No.	Rear brake
2.0 l - 147 kW FSI	1KJ	CII 41 (16”)
3.2 l - 184 kW		

2 Technical data for brakes

2.1 Brake master cylinder and brake servo, Touran

Brake master cylinder	∅ in mm	22
Brake servo (LHD)	∅ in inches	11
Brake servo (RHD)	∅ in inches	7 / 8

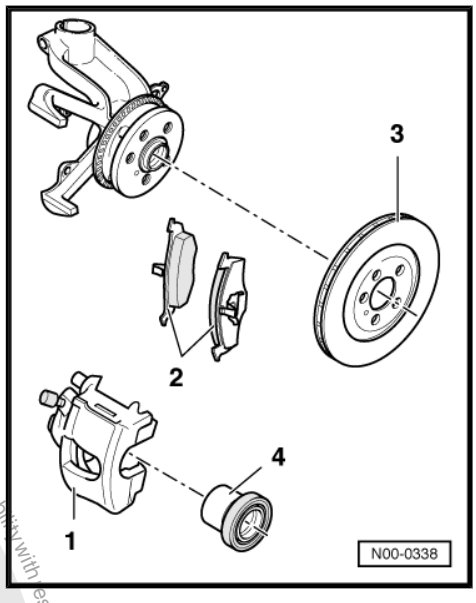
2.2 Brake master cylinder and brake servo, Golf, Eos

Brake master cylinder	∅ in mm	22
Brake servo (LHD)	∅ in inches	10
Brake servo (RHD)	∅ in inches	7 / 8

2.3 Front brakes

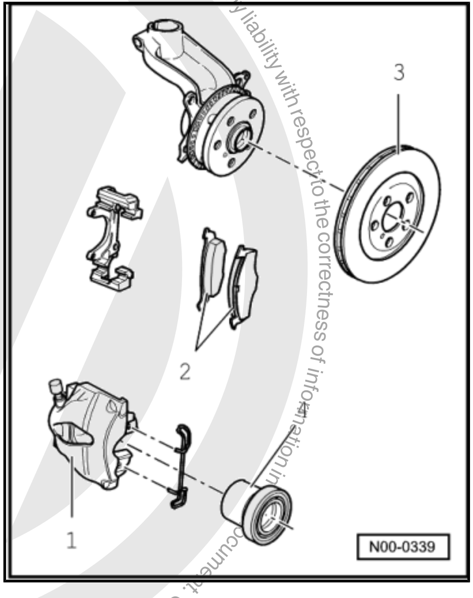
2.3.1 Front brakes FS III

Item	PR No.		1ZF / 1ZM
1	Brake caliper		FS III (15”)
2	Brake pad, thickness	mm	14
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	280
	Brake disc, thickness	mm	22
	Brake disc, wear limit	mm	19
4	Brake caliper piston	∅ in mm	54



2.3.2 Front brakes FN 3

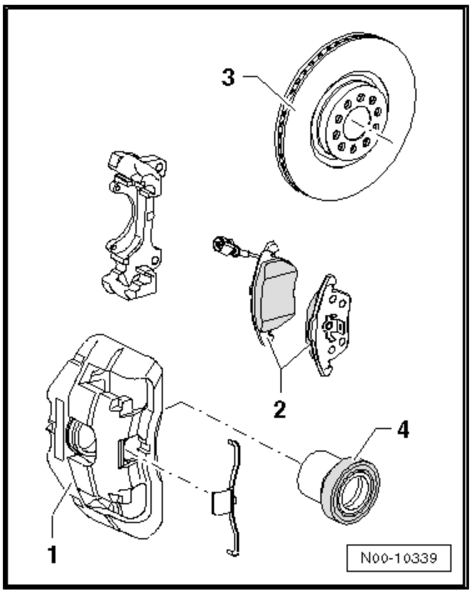
Item	PR No.		1ZE / 1ZP
1	Brake caliper		FN3 (15”)
2	Brake pad, thickness	mm	14
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	288
	Brake disc, thickness	mm	25
	Brake disc, wear limit	mm	22
4	Brake caliper piston	∅ in mm	54



Item	PR No.		1LJ / 1LL / 1ZD / 1LV
1	Brake caliper		FN3 (16”)
2	Brake pad, thickness	mm	14
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	312
	Brake disc, thickness	mm	25
	Brake disc, wear limit	mm	22
4	Brake caliper piston	∅ in mm	54

2.3.3 Front brakes FNR-G

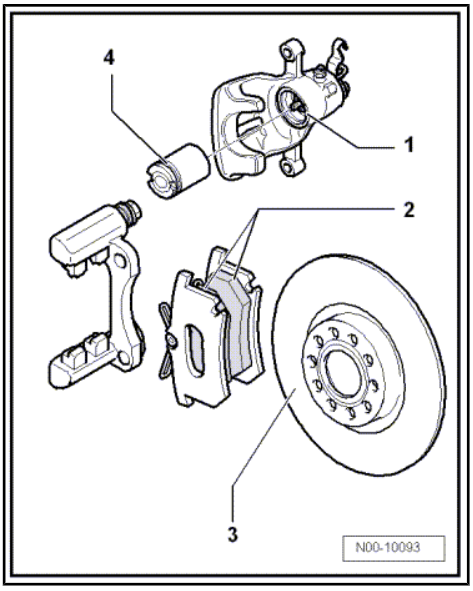
Item	PR No.		1LK / 1LM
1	Brake caliper		FNR-G (17”)
2	Brake pad, thickness	mm	14
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	345
	Brake disc, thickness	mm	30
	Brake disc, wear limit	mm	27
4	Brake caliper piston	∅ in mm	57



2.4 Rear brakes (disc brakes)

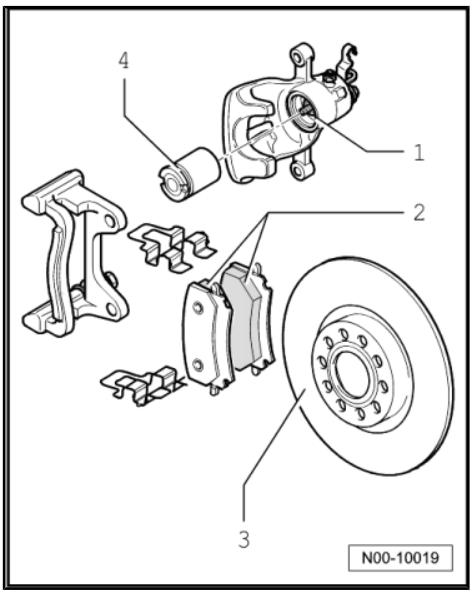
2.4.1 Rear brakes CI 38

Item	PR No.		1KQ / 1KD
1	Brake caliper		CI 38 (15")
2	Brake pad, thickness	mm	11
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	255
	Brake disc, thickness	mm	10
	Brake disc, wear limit	mm	8
4	Brake caliper piston	∅ in mm	38

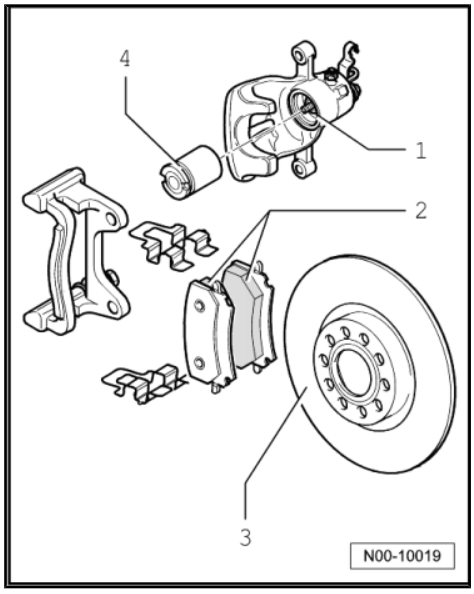


2.4.2 Rear brakes CII 38

Item	PR No.		1KY / 1KZ / 1KV
1	Brake caliper		CII 38 (16")
2	Brake pad, thickness	mm	11
	Brake pad, wear limit without back plate		2
3	Brake disc	∅ in mm	286
	Brake disc, thickness	mm	12
	Brake disc, wear limit		10
4	Brake caliper piston	∅ in mm	38



2.4.3 Rear brakes CII 41



Item	PR No.		1KF / 1KE
1	Brake caliper		CII 41 (15")
2	Brake pad, thickness	mm	11
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	260
	Brake disc, thickness	mm	12
	Brake disc, wear limit	mm	10
4	Brake caliper piston	∅ in mm	41

Item	PR No.		1KJ
1	Brake caliper		CII 41 (16")
2	Brake pad, thickness	mm	11
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	286
	Brake disc, thickness	mm	12
	Brake disc, wear limit	mm	10
4	Brake caliper piston	∅ in mm	41

Item	PR No.		2EL / 2EA
1	Brake caliper		CII 41 (17")
2	Brake pad, thickness	mm	11
	Brake pad, wear limit without back plate	mm	2
3	Brake disc	∅ in mm	310
	Brake disc, thickness	mm	22
	Brake disc, wear limit	mm	20
4	Brake caliper piston	∅ in mm	41

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 regulation 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

3.3.1 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.

3.3.2 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.

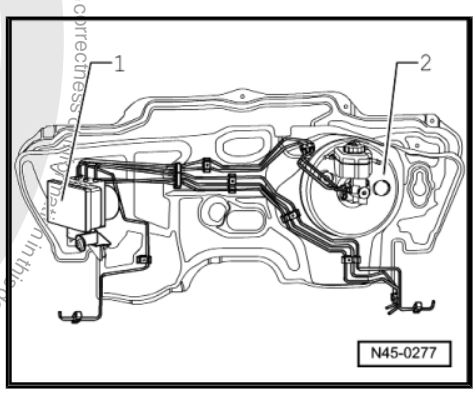
Vehicles with ABS are not fitted with a mechanical brake pressure regulator. Specially matched software in the control unit regulates the brake force distribution on the rear axle.

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 comes on, the rear wheels may lock prematurely during braking!

ABS layout in left-hand drive vehicle.

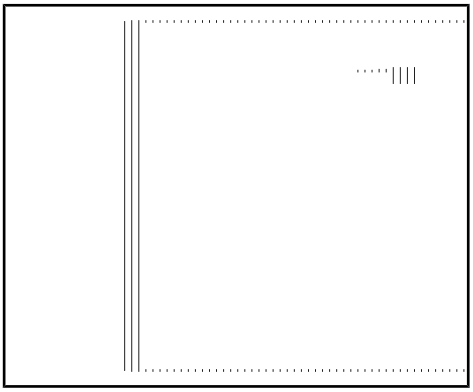
1 - Hydraulic unit and control unit

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”.

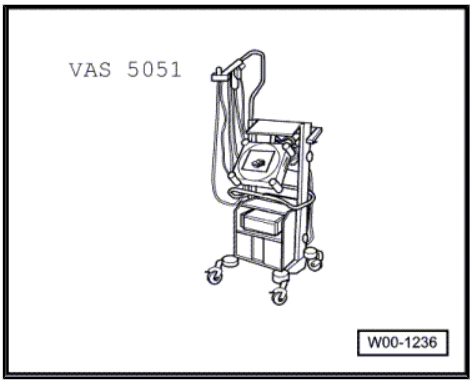
“Guided Fault Finding” is carried out with the vehicle diagnostic, testing and information system -VAS 5051- .

- 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 130 .
- 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 130 .
- 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. (Use sealing plugs from repair kit 1 H0 698 311 A).
- 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.
- Make sure not to touch any contact surfaces on the connector, pressure sensor and control unit as well as the silicone gel by hand or with objects.
- 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

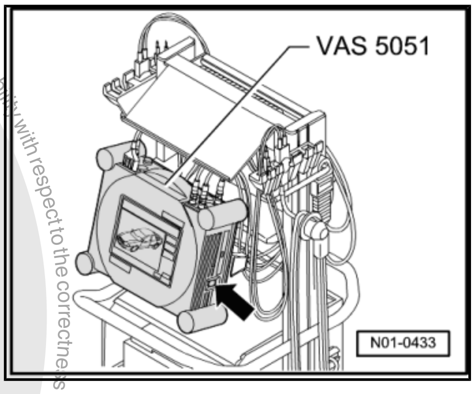
- Vehicle diagnosis, testing and information system -VAS 5051-
- Diagnosis cable -VAS 5051/1- or -VAS 5051/3-



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 connector of diagnosis cable -VAS 5051/1- or -VAS 5051/3- to diagnostic connection.



– Switch on tester -arrow-.

The tester 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 tester has interrogated all control units in vehicle.

– 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.

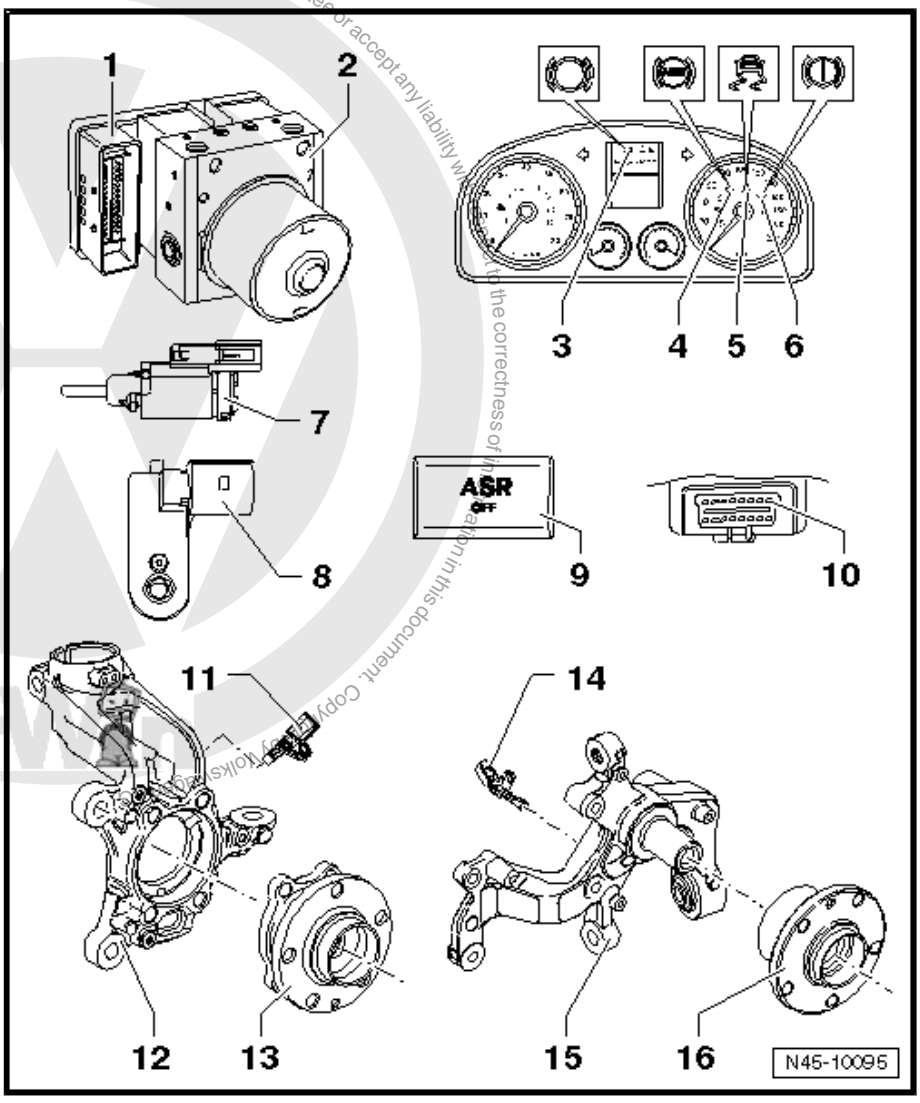
– Select “Function” shown on display.

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 fitting locations

4.1 ABS Mark 70 (ABS/TCS)



1 - ABS control unit -J104-

- ❑ Fitting location: on the hydraulic unit on right in engine compartment.
- ❑ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before disconnecting connector.
- ❑ Removing and installing ⇒ page 28

2 - ABS hydraulic unit -N55-

- ❑ Fitting location: on right in engine compartment.

The hydraulic unit consists of the components:

- ❑ ABS hydraulic pump -V64-
- ❑ Valve block (includes inlet/outlet valves)
- ❑ ABS hydraulic pump -V64- and valve block must not be separated from one another.
- ❑ Removing and installing ⇒ page 28

3 - Brake pad warning lamp -K32-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

4 - ABS warning lamp -K47-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

5 - Traction control system warning lamp -K86-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

6 - Brake system warning lamp -K118-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

7 - Brake light switch -F- up to week 45/2005

- ❑ Including brake pedal switch -F47- .
- ❑ Fitting location: on brake pedal.
- ❑ Removing, installing and adjusting ⇒ page 110 .

8 - Brake light switch -F- from week 45/2005

- ❑ Including brake pedal switch -F47- .
- ❑ Fitting location: on brake master cylinder.
- ❑ Removing and installing ⇒ page 138

9 - TCS button -E256-

- ❑ Fitting location: in centre console.

10 - Diagnostic connection

- ❑ Fitting location: driver side footwell cover.

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

- ❑ Removing and installing ⇒ page 56

12 - Wheel bearing housing

13 - Wheel bearing/hub unit

- ❑ ABS sensor ring is installed in the wheel bearing.

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

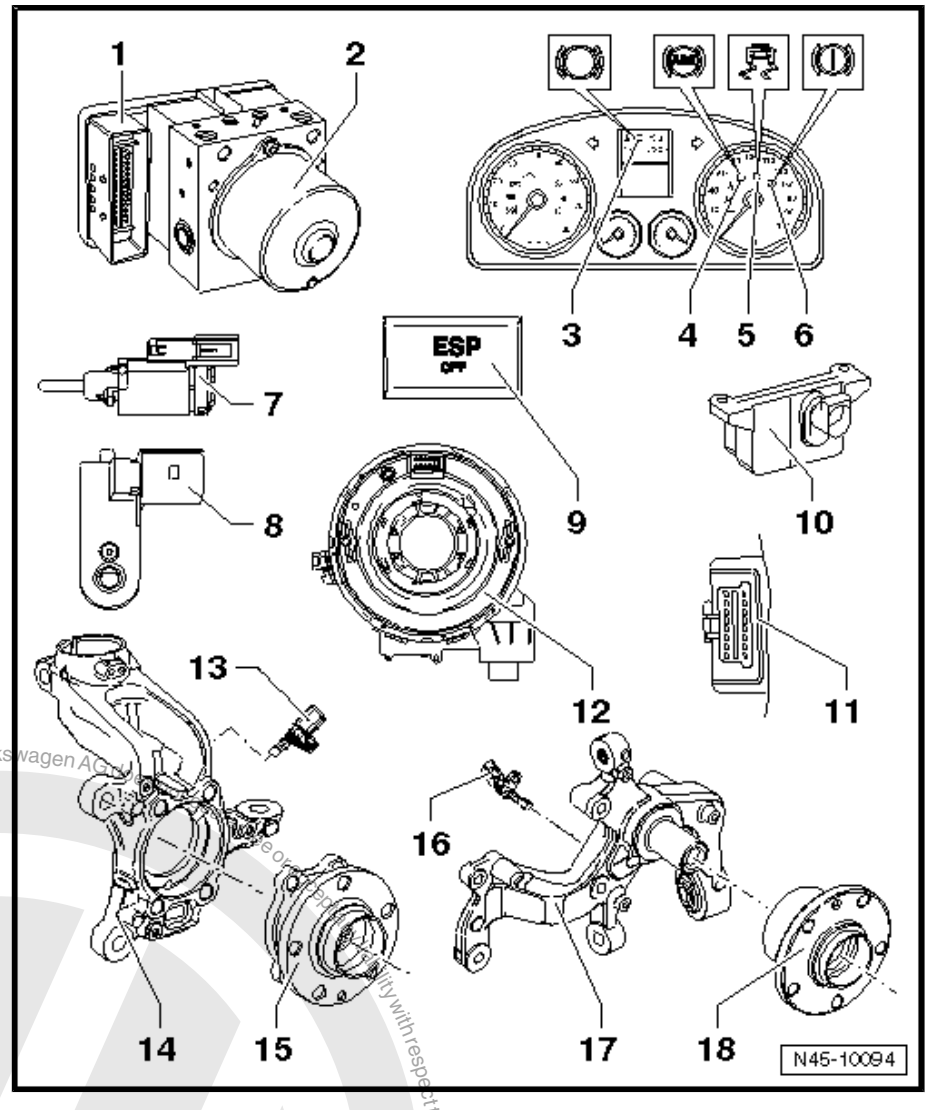
- ❑ Removing and installing (front-wheel drive) ⇒ page 57
- ❑ Removing and installing (four-wheel drive) ⇒ page 58

15 - Rear axle assembly with stub axle

16 - Wheel hub with wheel bearing

- ❑ ABS sensor ring is installed in the wheel bearing.

4.2 ABS Mark 60 (ABS/EDL/TCS/ESP)



1 - ABS control unit -J104-

- Fitting location: on the hydraulic unit on right in engine compartment.
- Do not separate connector before successfully completing self-diagnosis. Switch ignition off before disconnecting connector.
- Removing and installing ⇒ page 36

2 - ABS hydraulic unit -N55-

- Fitting 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 36

3 - Brake pad warning lamp -K32-

- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

4 - ABS warning lamp -K47-

- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

5 - ESP and TCS warning lamp -K155-

- Only vehicles with ABS/EDL/TCS/ESP.
- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

6 - Brake system warning lamp -K118-

- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

7 - Brake light switch -F- up to week 45/2005

- Including brake pedal switch -F47- .
- Fitting location: on brake pedal.
- Removing and installing ⇒ page 110

8 - Brake light switch -F- from week 45/2005

- Including brake pedal switch -F47- .
- Fitting location: on brake master cylinder.

- ❑ Removing and installing ⇒ page 138

9 - TCS and ESP button -E256-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Fitting location: in centre console.

10 - ESP sensor unit -G419-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Fitting location in Touran: behind glove box.
- ❑ Fitting location in Golf and Eos: 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 (Touran) ⇒ page 60
- ❑ Removing and installing (Golf, Eos) ⇒ page 60 .

11 - Diagnostic connection

- ❑ Fitting location: driver side footwell cover.

12 - Steering angle sender -G85-

- ❑ Fitting location: on steering column between steering wheel and steering column switch.
- ❑ Removing and installing ⇒ page 61

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

- ❑ Removing and installing ⇒ page 56

14 - Wheel bearing housing

15 - Wheel bearing/hub unit

- ❑ ABS sensor ring is installed in the wheel bearing.

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

Figure for front-wheel drive

- ❑ Removing and installing (front-wheel drive) ⇒ page 57
- ❑ Removing and installing (four-wheel drive) ⇒ page 58

17 - Wheel bearing housing

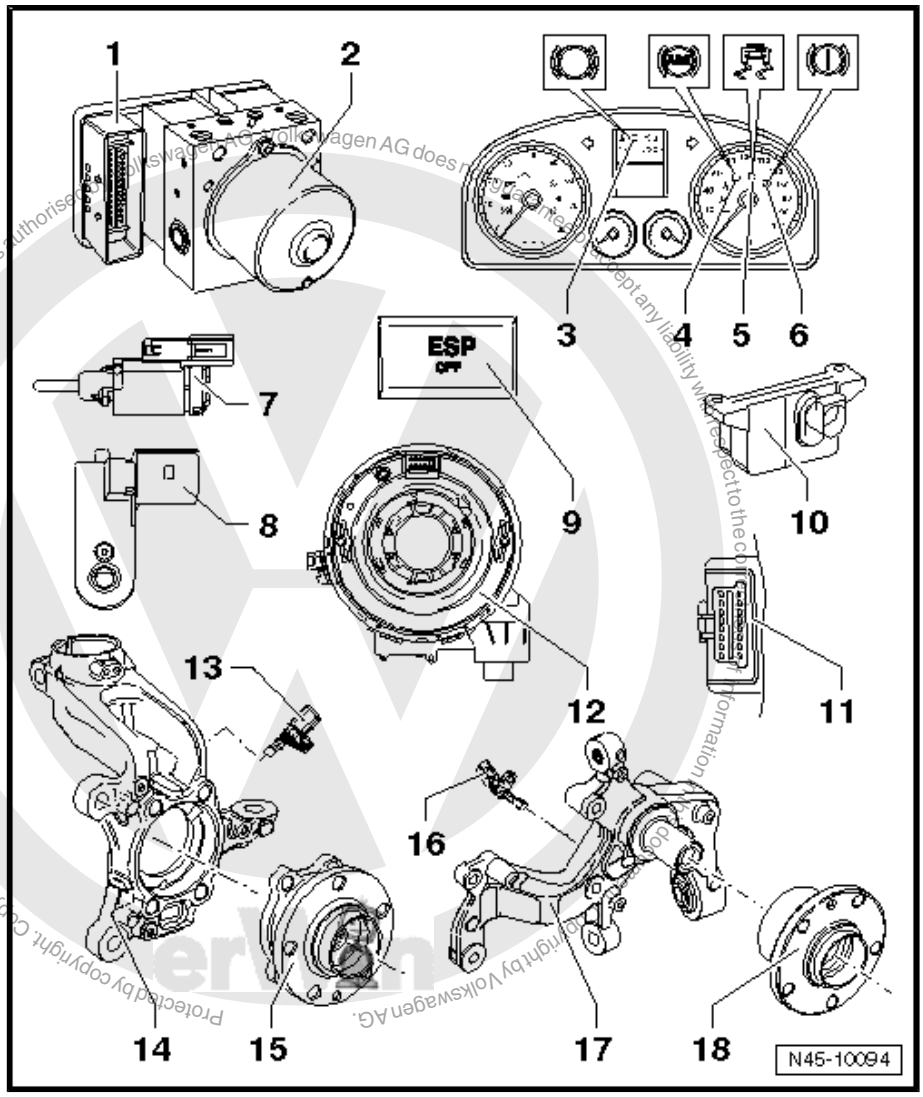
Figure for front-wheel drive

18 - Wheel bearing/hub unit

Figure for front-wheel drive

- ❑ ABS sensor ring is installed in the wheel bearing.

4.3 ABS Mark 60 (ABS/EDL/TCS/ESP) up to week 22/2008



1 - ABS control unit -J104-

- Fitting location: on the hydraulic unit on right in engine compartment.
- Do not separate connector before successfully completing self-diagnosis. Switch ignition off before disconnecting connector.
- Removing and installing ⇒ page 42

2 - ABS hydraulic unit -N55-

- Fitting 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 42

3 - Brake pad warning lamp -K32-

- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

4 - ABS warning lamp -K47-

- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

5 - ESP and TCS warning lamp -K155-

- Only vehicles with ABS/EDL/TCS/ESP.
- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

6 - Brake system warning lamp -K118-

- Fitting location: in dash panel insert.
- Function: ⇒ page 23 .

7 - Brake light switch -F- up to week 45/2005

- Including brake pedal switch -F47- .
- Fitting location: on brake pedal.
- Removing and installing ⇒ page 110

8 - Brake light switch -F- from week 45/2005

- Including brake pedal switch -F47- .
- Fitting location: on brake master cylinder.

- ❑ Removing and installing ⇒ page 138

9 - TCS and ESP button -E256-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Fitting location: in centre console.

10 - ESP sensor unit -G419-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Fitting location in Touran: behind glove box.
- ❑ Fitting location in Golf and Eos: 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 (Touran) ⇒ page 60
- ❑ Removing and installing (Golf, Eos) ⇒ page 60 .

11 - Diagnostic connection

- ❑ Fitting location: driver side footwell cover.

12 - Steering angle sender -G85-

- ❑ Fitting location: on steering column between steering wheel and steering column switch.
- ❑ Removing and installing ⇒ page 61

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

- ❑ Removing and installing ⇒ page 56

14 - Wheel bearing housing

15 - Wheel bearing/hub unit

- ❑ ABS sensor ring is installed in the wheel bearing.

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

Figure for front-wheel drive

- ❑ Removing and installing (front-wheel drive) ⇒ page 57
- ❑ Removing and installing (four-wheel drive) ⇒ page 58

17 - Wheel bearing housing

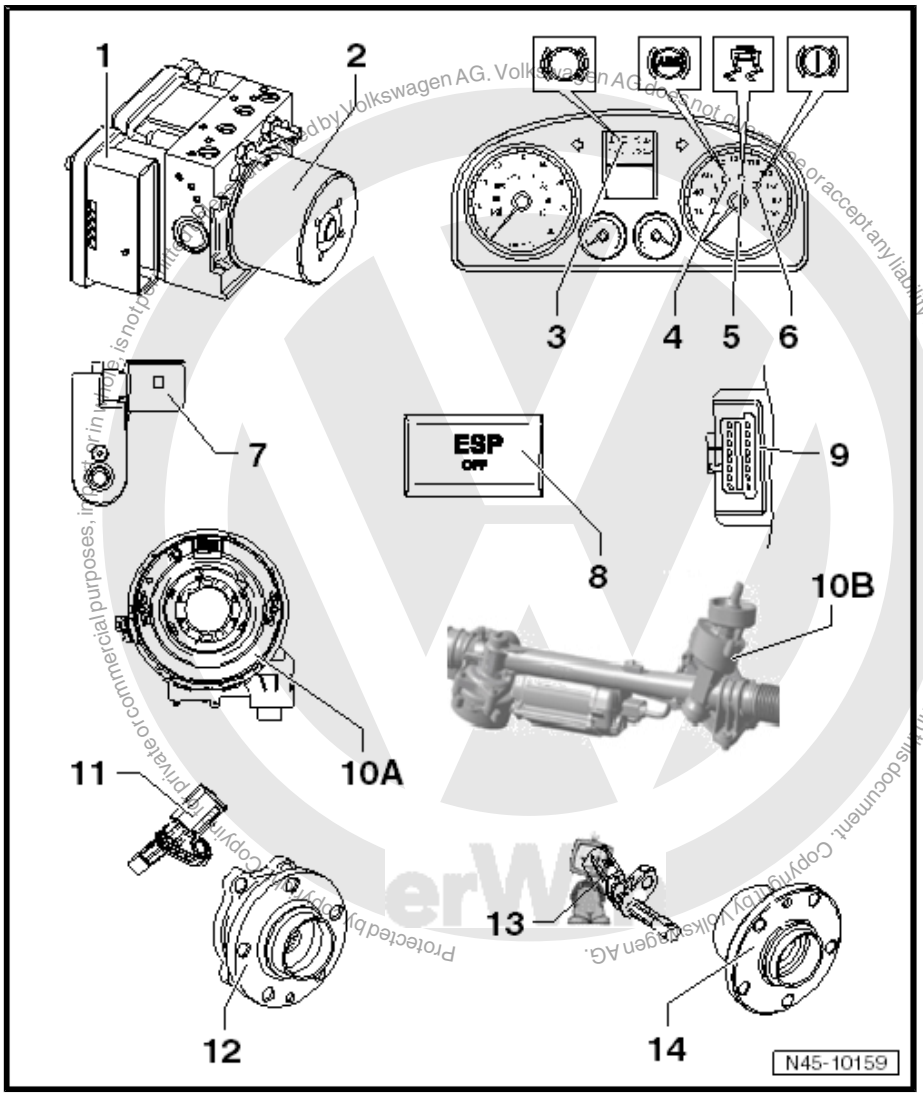
Figure for front-wheel drive

18 - Wheel bearing/hub unit

Figure for front-wheel drive

- ❑ ABS sensor ring is installed in the wheel bearing.

4.4 ABS Mark 60 (ABS/EDL/TCS/ESP) from week 22/2008



1 -

- ❑ Fitting location: on the hydraulic unit on right in engine compartment.
- ❑ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before disconnecting 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 51

2 - ABS hydraulic unit -N55-

- ❑ Fitting 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 51

3 - Brake pad warning lamp -K32-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

4 - ABS warning lamp -K47-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

5 - ESP and TCS warning lamp -K155-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

6 - Brake system warning lamp -K118-

- ❑ Fitting location: in dash panel insert.
- ❑ Function: ⇒ page 23 .

7 - Brake light switch -F-

- ❑ Including brake pedal switch -F47- .

- ❑ Fitting location: on brake master cylinder.
- ❑ Removing and installing ⇒ page 138

8 - TCS and ESP button -E256-

- ❑ Only vehicles with ABS/EDL/TCS/ESP.
- ❑ Fitting location: in centre console.

9 - Diagnostic connection

- ❑ Fitting location: driver side footwell cover.

10 - Steering angle sender -G85-

Note

- ❑ Fitting location A: on steering column between steering wheel and steering column switch.
- ❑ Removing and installing ⇒ page 61
- ❑ Fitting location B: in steering box.

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

- ❑ Removing and installing ⇒ page 56

12 - Wheel bearing/hub unit

- ❑ ABS sensor ring is installed in the wheel bearing.

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

Figure for front-wheel drive

- ❑ Removing and installing (front-wheel drive) ⇒ page 57
- ❑ Removing and installing (four-wheel drive) ⇒ page 58

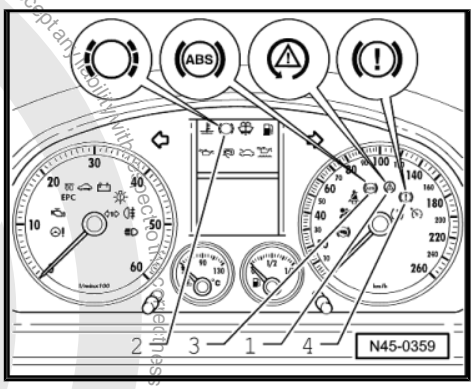
14 - Wheel bearing/hub unit

Figure for front-wheel drive

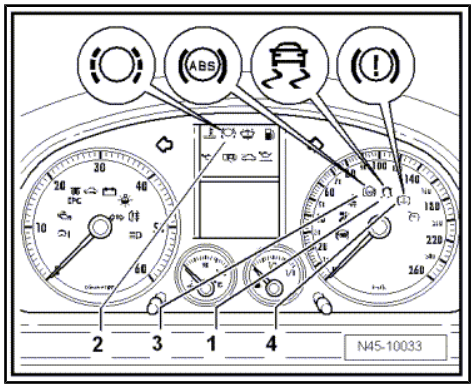
- ❑ ABS sensor ring is installed in the wheel bearing.

5 Fault display via warning lamps

Warning lamps, Touran



Warning lamps, Golf



Item	Description
1	Traction control system warning lamp -K86-
	ESP and TCS 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 wiring 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 switching ignition on and completion of test sequence 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 -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 ⇒ Interrogate fault memory.

-a- Short-circuit to positive in TCS 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 regulating the system.

- 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 ⇒ perform electrical check.

ESP and TCS warning lamp -K155-

- If the ESP and TCS warning lamp -K155- -1- does not go out after ignition is switched on and test sequence is completed, 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 ⇒ 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- .

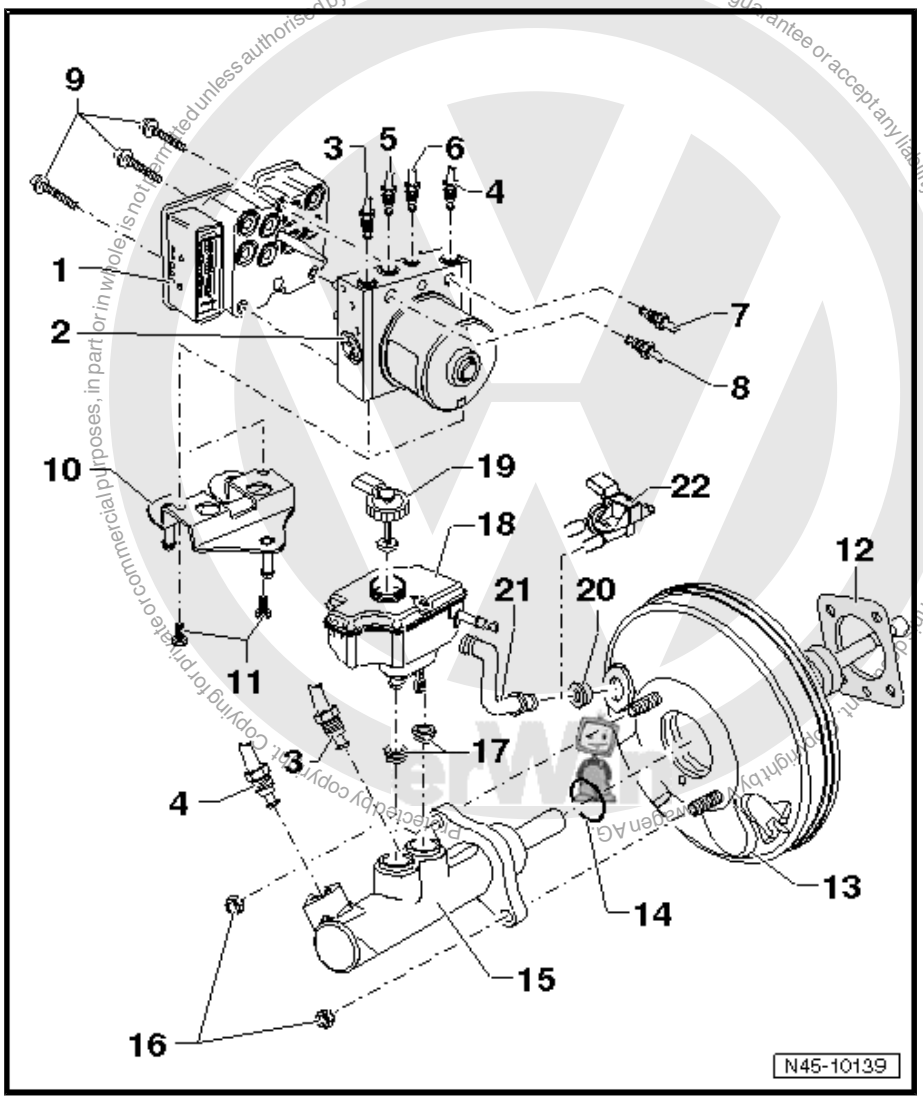
If the ESP and TCS warning lamp -K155- flashes while the vehicle is in motion, the TCS or ESP system is regulating the system.

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

-a- The ESP and TCS warning lamp -K155- is defective ⇒ perform electrical check.

6 Assembly overview - hydraulic unit, brake servo/brake master cylinder

6.1 ABS Mark 70 (ABS/TCS)



1 - ABS control unit -J104-

- ❑ Removing and installing ⇒ page 28

2 - ABS hydraulic unit -N55-

- ❑ Removing and installing ⇒ page 28

3 - Brake line

- ❑ From primary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: union nut with thread M 10 x 1

4 - Brake line

- ❑ From secondary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: union nut with thread M 12 x 1

5 - Brake line

- ❑ To front left brake caliper
- ❑ Identification: union nut with thread M 12 x 1

6 - Brake line

- ❑ To front right brake caliper
- ❑ Identification: union nut with thread M 10 x 1

7 - Brake line

- ❑ To rear left brake caliper
- ❑ Identification: union nut with thread M 12 x 1

8 - Brake line

- ❑ To rear right brake caliper
- ❑ Identification: union nut with thread M 10 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.
- ❑ Diesel engines are fitted with an exhauster to create the required vacuum ⇒ page 136 .

- ❑ 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 141

14 - Sealing ring

15 - Brake master cylinder

- ❑ Allocation ⇒ Electronic Parts Catalogue (ETKA) .
- ❑ Cannot be repaired. If faulty, renew as a complete unit.
- ❑ Removing and installing ⇒ page 139

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-

- ❑ On vehicles with FSI engine without HBV (Hydraulic Brake with Vacuum servo)
- ❑ Removing and installing ⇒ page 137

6.1.1 Connecting brake lines from brake master cylinder to hydraulic unit

On brake master cylinder:

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

- Identification: union nut with thread M 10 x 1

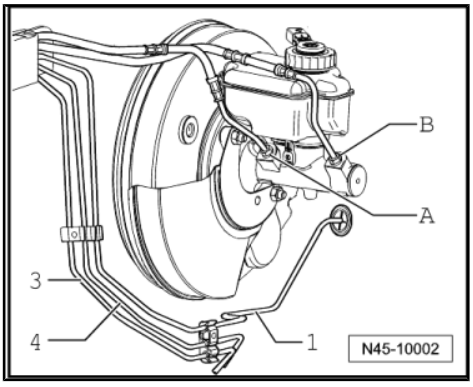
B - Secondary piston circuit of master brake cylinder to hydraulic unit.

- Identification: union nut with thread M 12 x 1

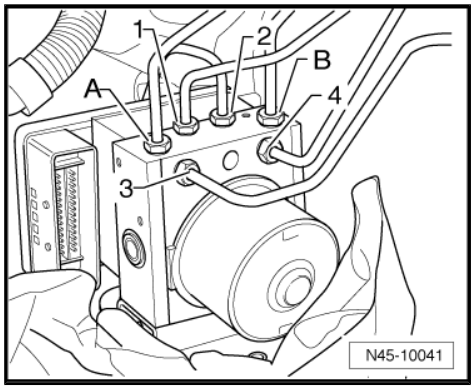
1 - From hydraulic unit to front left brake caliper.

3 - Hydraulic unit to rear right brake caliper.

4 - 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 M 10 x 1

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

- Identification: union nut with thread M 12 x 1

1 - From hydraulic unit to front left brake caliper.

- Identification: union nut with thread M 12 x 1

2 - From hydraulic unit to front right brake caliper.

- Identification: union nut with thread M 10 x 1

3 - Hydraulic unit to rear right brake caliper.

- Identification: union nut with thread M 10 x 1

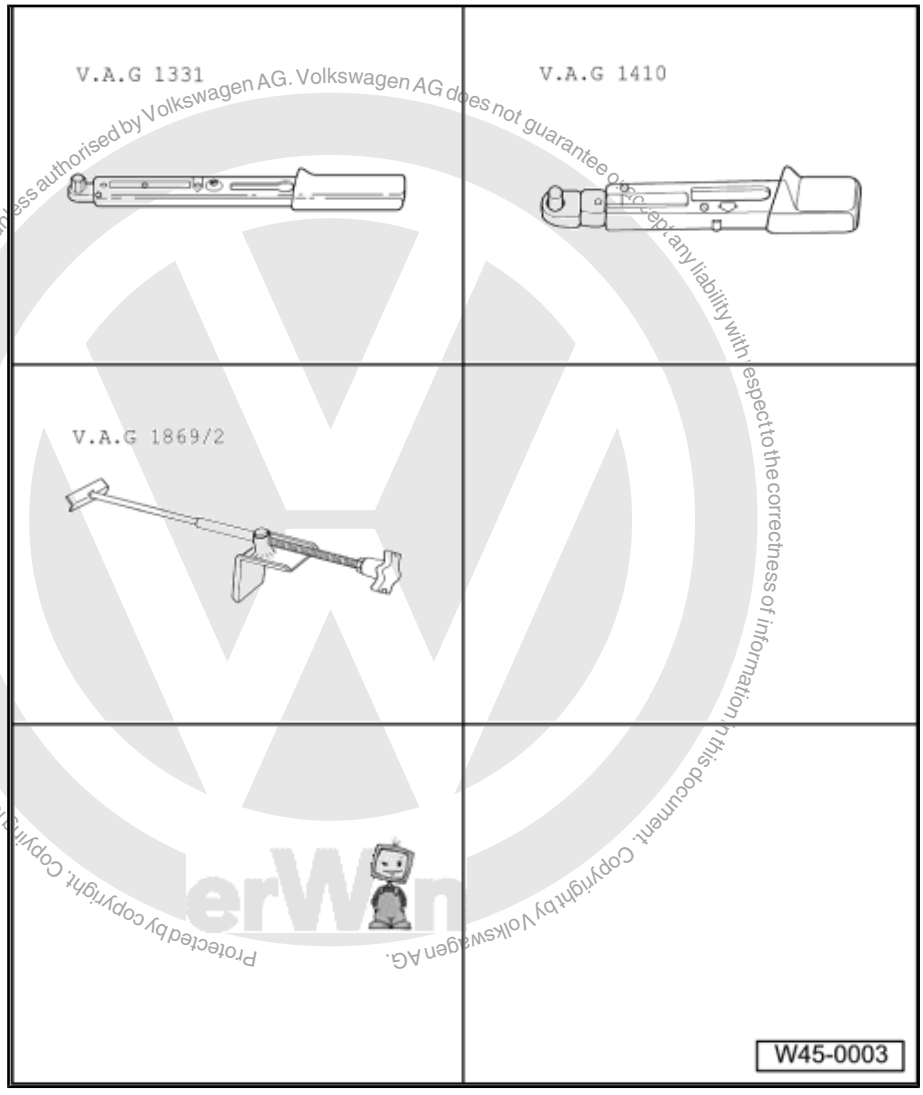
4 - Hydraulic unit to rear left brake caliper.

- Identification: union nut with thread M 12 x 1

6.1.2 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-



Sealing plugs repair kit, Part No. 1H0 698 311 A

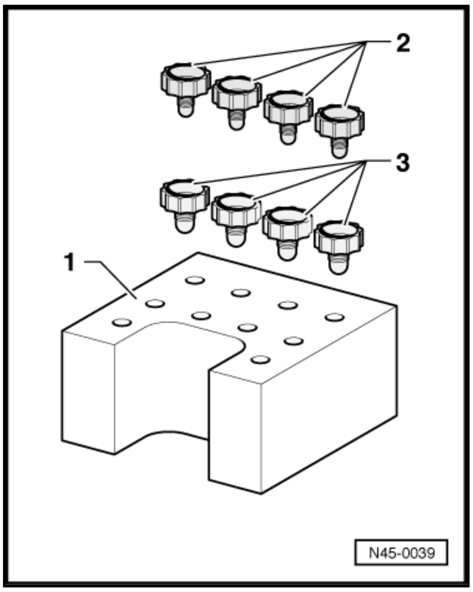
The transport protection for the contact pins must always be placed on the hydraulic unit after the control unit has been disconnected from the hydraulic unit.

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

1 - Transport protection for contact pins (foam)

2 - Sealing plug M 10

3 - Sealing plug M 12



Removing

Fitting 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.

– Note or request radio code on vehicles with coded radio if necessary.

– Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

– 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-cylinder diesel engine (2 valve); Rep. Gr. 23 ; Removing and installing mixture preparation - injection .

2.0 l diesel engine:

– Touran vehicles only: remove plenum chamber middle bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .

– Remove connecting pipe between intake hose and turbocharger.

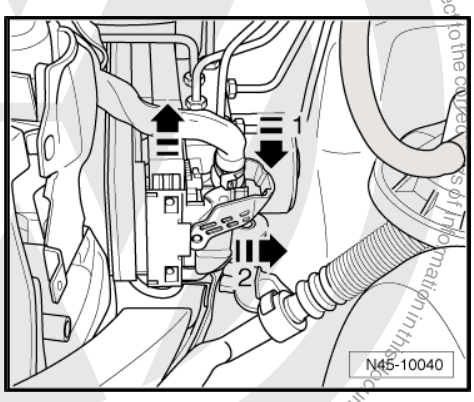
– Remove toothed belt guard upper part.

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:

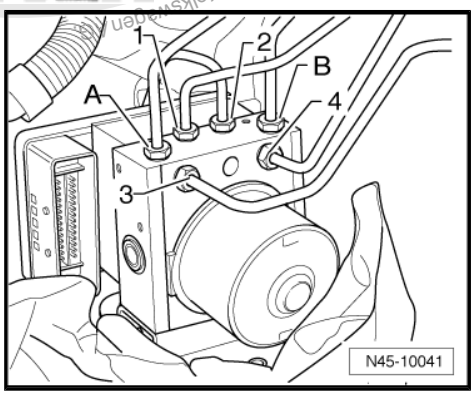
– Release connector on control unit in direction of arrow -1- and pull off -2-.



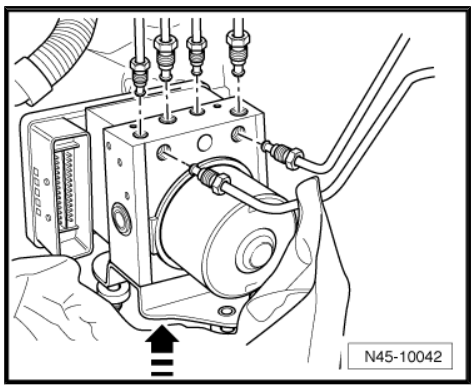
– Apply brake pedal depressor -V.A.G 1869/2- .
– Connect bleeder bottle hose to front left brake caliper bleeder valve and rear left brake caliper bleeder valve and open bleeder valves.
– Depress brake pedal at least 60 mm using brake pedal depressor -V.A.G 1869/2- .
– Close front left and rear left 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.



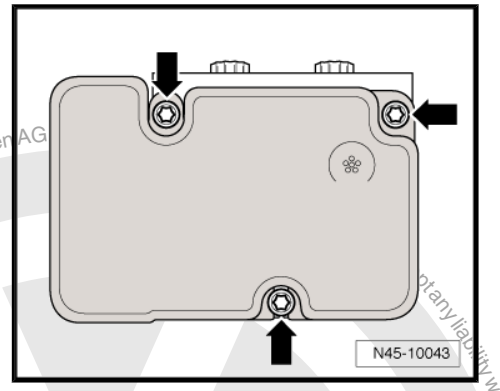
– Immediately seal brake lines and threaded holes with seal plugs from repair set Part No. 1H0 698 311 A.
– Identify brake lines (brake calipers) -1 to 4-, unscrew and seal.
– Pull hydraulic unit with control unit upwards out of dampers.



6.1.3 Unbolting control unit from hydraulic unit

– Place hydraulic unit with control unit upwards on a clean flat level surface.

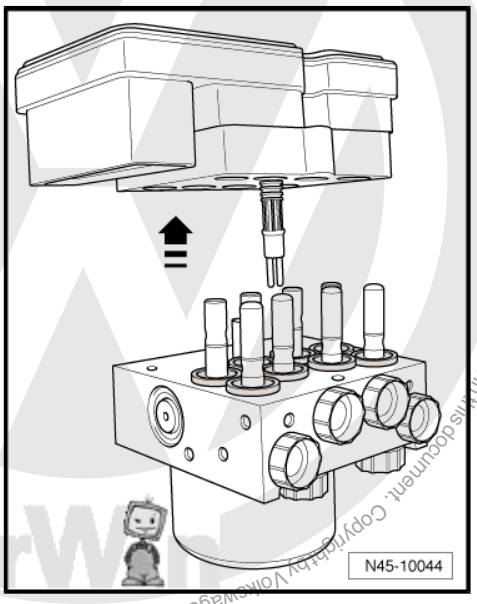
– Remove Torx socket head bolts -arrows-.



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

WARNING

- *The printed circuit board becomes visible when the control unit is removed.*
- *No moisture or particles of dirt may enter the 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.

6.1.4 Installing new control unit

WARNING

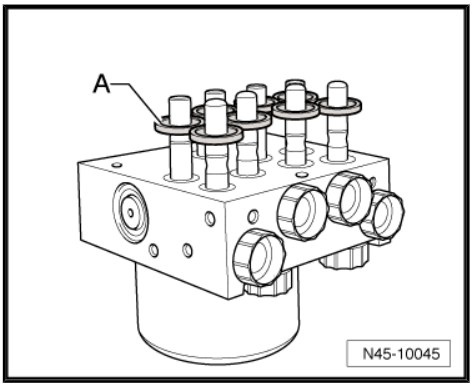
Severe shocks (e.g. dropping, impact) may destroy the control unit. The control unit must not then be used.

- 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 socket head 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.*

6.1.5 Installing control unit and hydraulic unit

Note

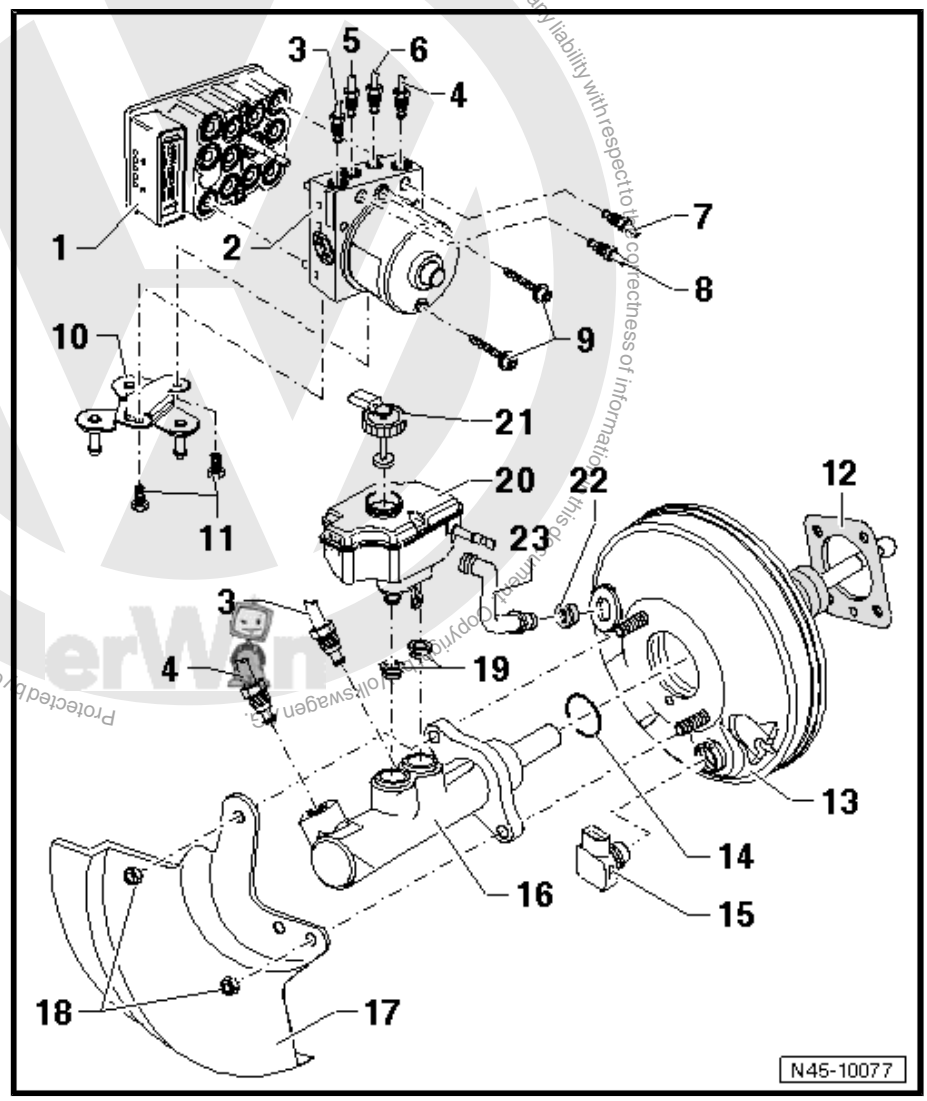
- *Remove sealing plugs from new hydraulic unit only when the corresponding brake line is going to be fitted.*
- *If sealing plugs are removed too early from the hydraulic unit, brake fluid can escape, and it can then no longer be guaranteed that the unit can be sufficiently filled and bled.*
- *When 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 130 .
– Code radio.
– Code control unit -J104- with ⇒ Vehicle diagnosis, testing and information system VAS 5051 in ”Guided fault finding”.

Specified torques:

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 M 10 x 1	14 Nm
Thread M 12 x 1	14 Nm

6.2 ABS Mark 60 (ABS/EDL/TCS/ESP)



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 36

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 36

3 - Brake line

- ❑ From primary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

4 - Brake line

- ❑ From secondary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

5 - Brake line

- ❑ To front left brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

6 - Brake line

- ❑ To front right brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 10x1.

7 - Brake line

- ❑ To rear left brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

8 - Brake line

- ❑ To rear right brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 10x1.

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 137 .
- ❑ A vacuum sender is fitted in vehicles with HBV ⇒ page 62 .
- ❑ Diesel engines are fitted with an exhauster to create the required vacuum ⇒ page 136 .
- ❑ 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 141

14 - Sealing ring

15 - Brake servo vacuum sender -G483-

- ❑ Only on vehicles having HBV
- ❑ Removing and installing ⇒ page 62

16 - Brake master cylinder

- ❑ Allocation ⇒ Electronic Parts Catalogue (ETKA) .
- ❑ Cannot be repaired. If faulty, renew as a complete unit.
- ❑ Removing and installing ⇒ page 139

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

6.2.1 Connecting brake lines from brake master cylinder to hydraulic unit

On brake master cylinder:

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

- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

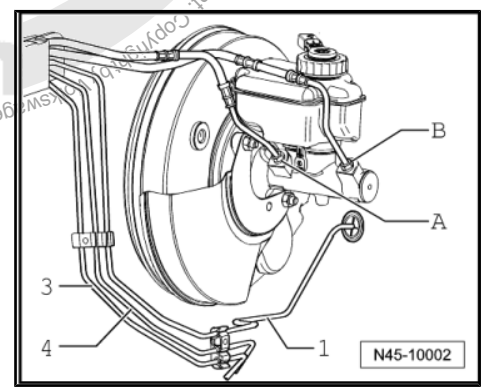
B - Secondary piston circuit of master brake cylinder to hydraulic unit.

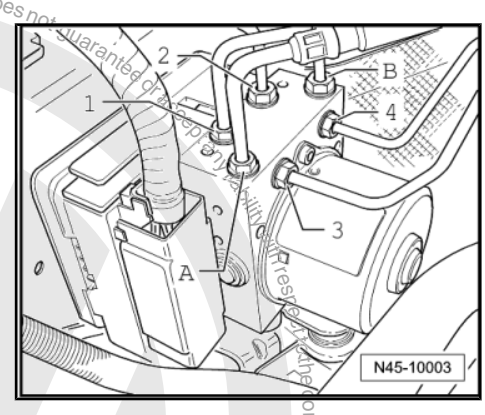
- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

1 - From hydraulic unit to front left brake caliper.

3 - Hydraulic unit to rear right brake caliper.

4 - Hydraulic unit to rear left brake caliper.





On hydraulic unit:

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

- Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

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

- Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

1 - From hydraulic unit to front left brake caliper.

- Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

2 - From hydraulic unit to front right brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 10x1.

3 - Hydraulic unit to rear right brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 10x1.

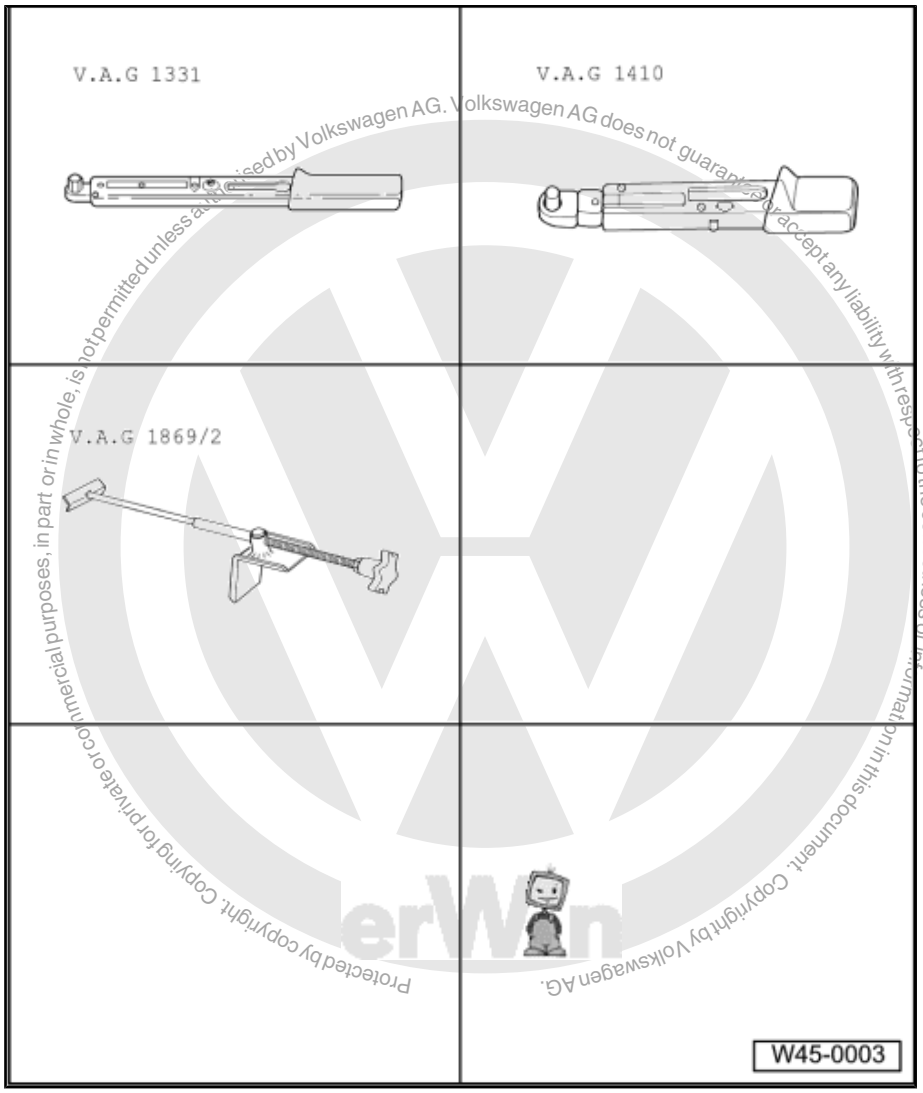
4 - Hydraulic unit to rear left brake caliper.

- Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

6.2.2 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-



Sealing plugs repair kit, Part No. 1H0 698 311 A

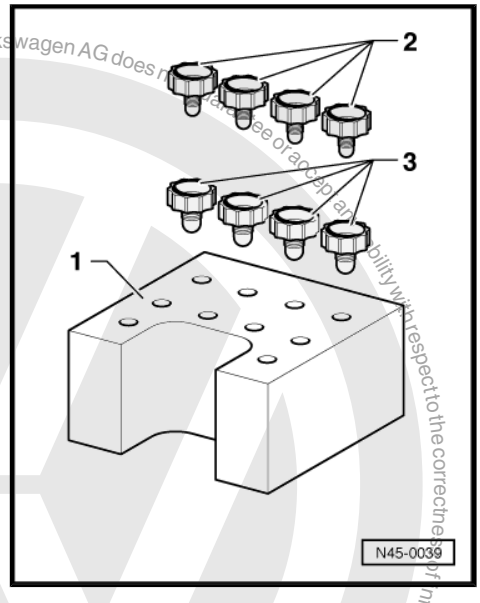
The transport protection for the contact pins must always be placed on the hydraulic unit after the control unit has been disconnected from the hydraulic unit.

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

1 - Transport protection for contact pins (foam)

2 - Sealing plug M 10

3 - Sealing plug M 12



Removing

Fitting 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.

– Note or request radio code on vehicles with coded radio if necessary.

– Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

– 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-cylinder diesel engine (2 valve); Rep. Gr. 23 ; Removing and installing mixture preparation - injection .

2.0 l diesel engine:

– Touran vehicles only: remove plenum chamber middle bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .

– Remove connecting pipe between intake hose and turbocharger.

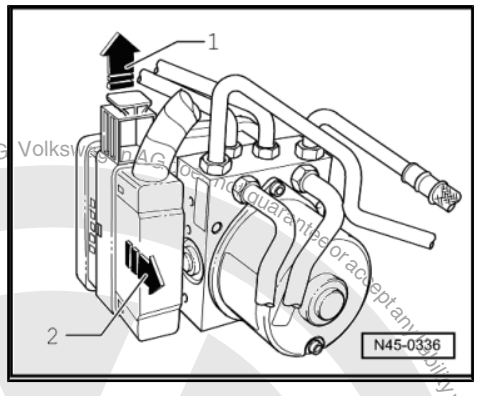
– Remove toothed belt guard upper part.

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:

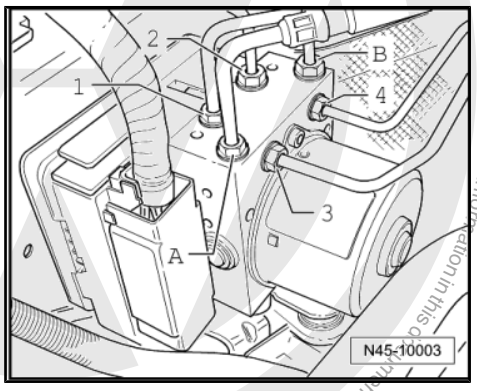
– Release connector on control unit in direction of arrow -1- and pull off -2-.



– 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 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.



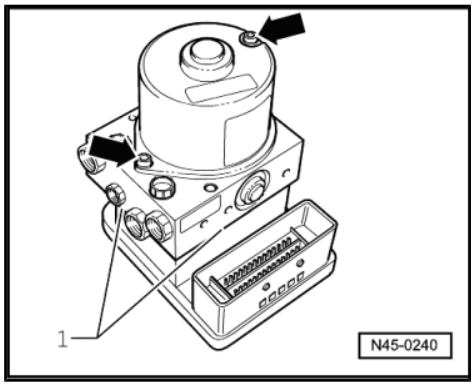
– Immediately seal brake lines and threaded holes with seal plugs from repair set Part No. 1H0 698 311 A.
– Identify brake lines (brake calipers) -1 to 4-, unscrew and seal.
– Pull hydraulic unit with control unit upwards out of dampers.

6.2.3 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 socket head bolts E5 -arrows- from hydraulic pump.

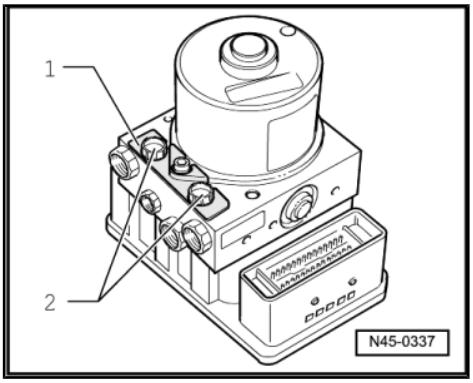


WARNING

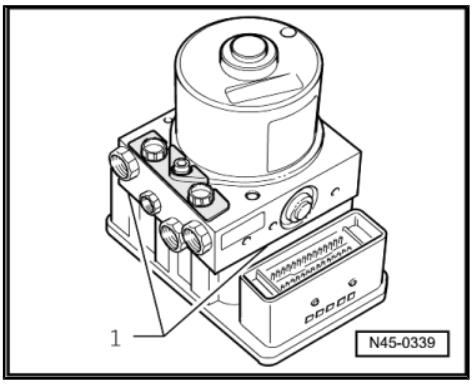
Hydraulic pump must not be separated from hydraulic unit.

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.

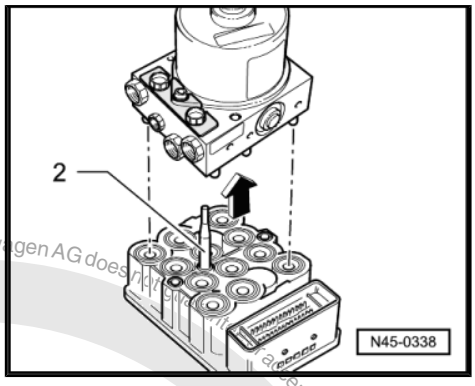


When pulling off the control unit, ensure that the hydraulic unit contact pins are not canted against the control unit solenoids.

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.



6.2.4 Installing new control unit

WARNING

Severe shocks (e.g. dropping, impact) may destroy the control unit. The 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.*

6.2.5 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.*

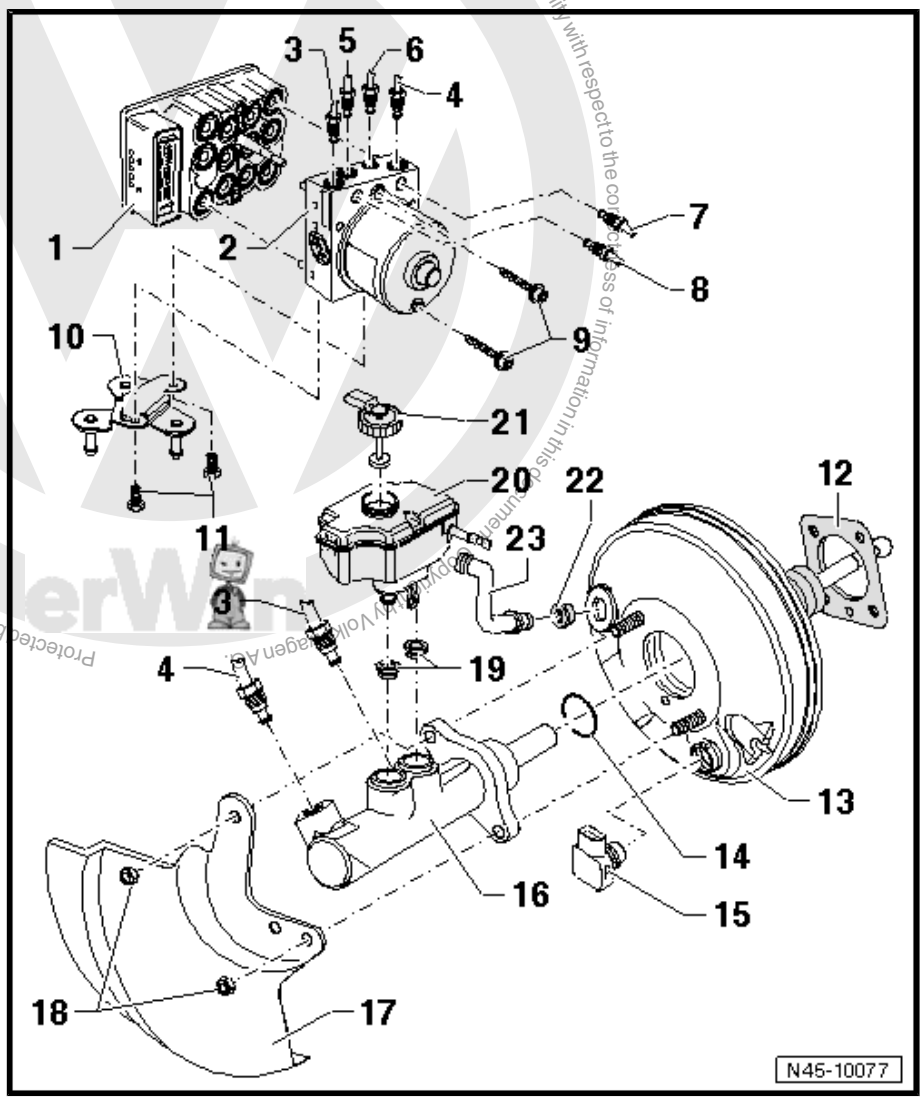
– Install in reverse order.
– Remove brake pedal depressor -V.A.G 1869/2- .
– Bleed brake system ⇒ page 130 .
– Code radio.
– Code control unit -J104- with ⇒ Vehicle diagnosis, testing and information system VAS 5051 in ”Guided fault finding”.

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:

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 M 10 x 1	14 Nm
Thread M 12 x 1	14 Nm

6.3 ABS Mark 60 (ABS/EDL/TCS/ESP) up to week 22/2008



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 42

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 42

3 - Brake line

- ❑ From primary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

4 - Brake line

- ❑ From secondary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

5 - Brake line

- ❑ To front left brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

6 - Brake line

- ❑ To front right brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 10x1.

7 - Brake line

- ❑ To rear left brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

8 - Brake line

- ❑ To rear right brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 10x1.

9 - Torx socket head bolt, 5.5 Nm

- ❑ Use new bolts.

10 - Retainer

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 137 .
- ❑ A vacuum sender is fitted in vehicles with HBV ⇒ page 62 .
- ❑ Diesel engines are fitted with an exhauster to create the required vacuum ⇒ page 136 .
- ❑ 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 141

14 - Sealing ring

15 - Brake servo vacuum sender -G483-

- ❑ Only on vehicles having HBV
- ❑ Removing and installing ⇒ page 62

16 - Brake master cylinder

- ❑ Allocation ⇒ Electronic Parts Catalogue (ETKA) .
- ❑ Cannot be repaired. If faulty, renew as a complete unit.
- ❑ Removing and installing ⇒ page 139

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

6.3.1 Connecting brake lines from brake master cylinder to hydraulic unit

On brake master cylinder:

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

- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

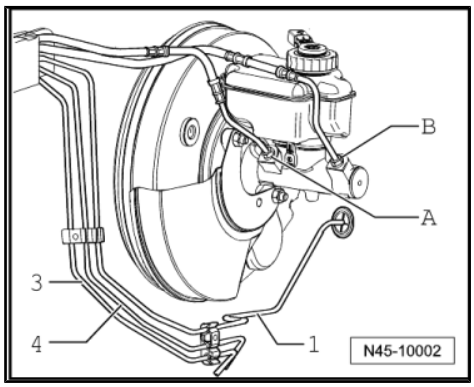
B - Secondary piston circuit of master brake cylinder to hydraulic unit.

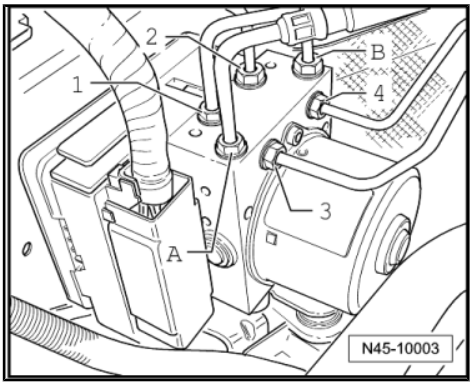
- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

1 - From hydraulic unit to front left brake caliper.

3 - Hydraulic unit to rear right brake caliper.

4 - Hydraulic unit to rear left brake caliper.





On hydraulic unit:

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

- Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

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

- Identification: ∅ 6.5 mm and union nut with long thread M 12x1.

1 - From hydraulic unit to front left brake caliper.

- Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

2 - From hydraulic unit to front right brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 10x1.

3 - Hydraulic unit to rear right brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 10x1.

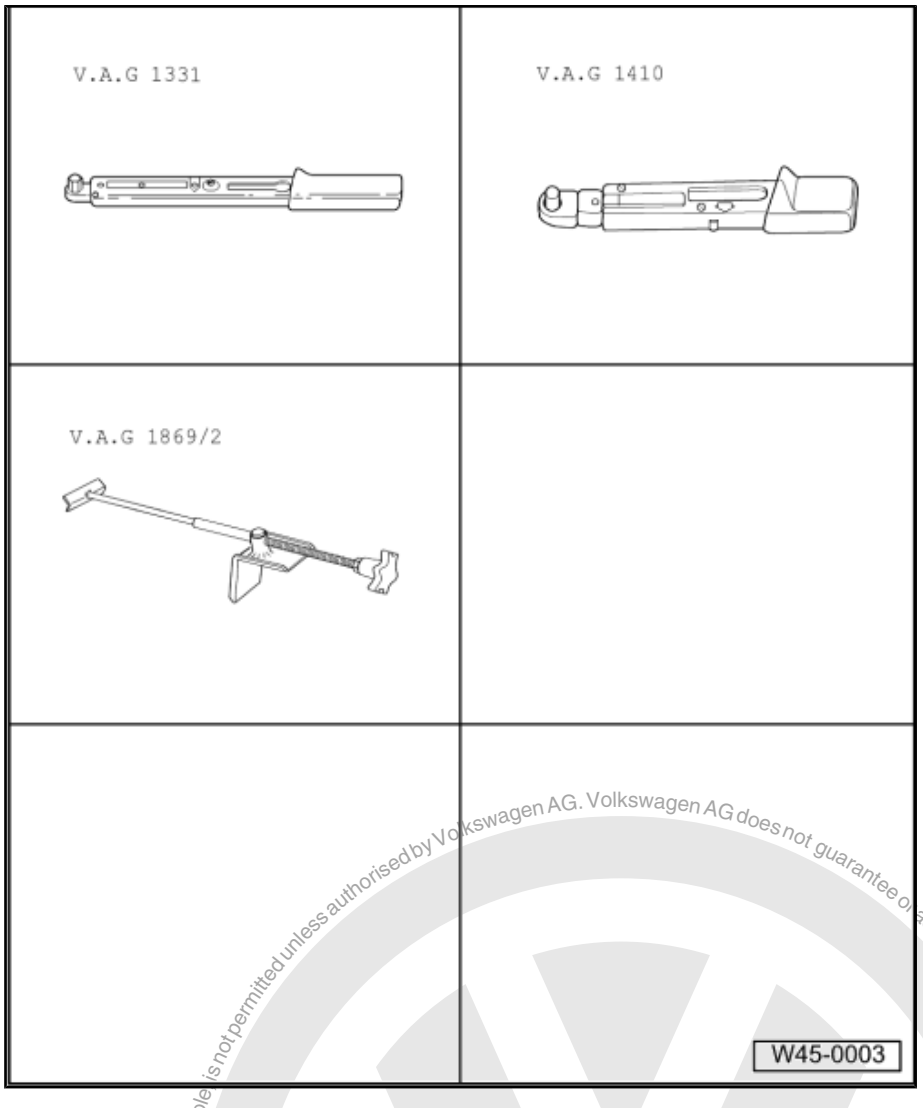
4 - Hydraulic unit to rear left brake caliper.

- Identification: ∅ 5.25 mm and union nut with short thread M 12x1.

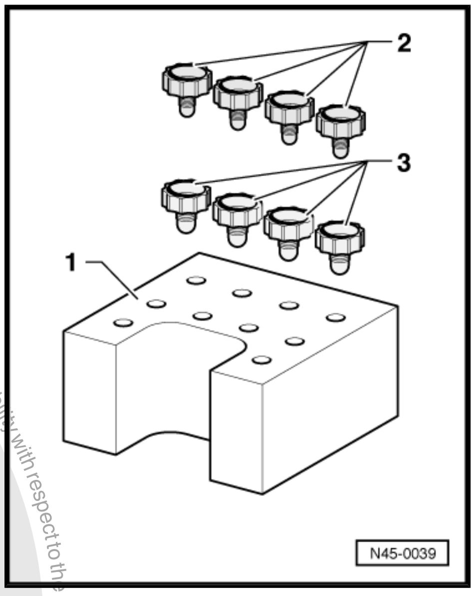
6.3.2 Removing control unit and hydraulic unit

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-



Sealing plugs repair kit, Part No. 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 M 10

3 - Sealing plug M 12

Removing

Fitting 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.

– Note or request radio code on vehicles with coded radio if necessary.

– Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

– 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-cylinder diesel engine (2 valve); Rep. Gr. 23 ; Removing and installing mixture preparation - injection .

2.0 l diesel engine:

– Touran vehicles only: remove plenum chamber middle bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .

– Remove connecting pipe between intake hose and turbocharger.

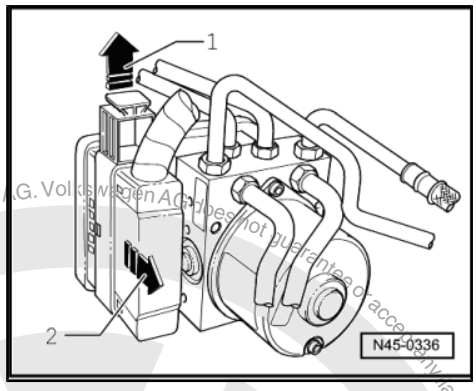
– Remove toothed belt guard upper part.

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:

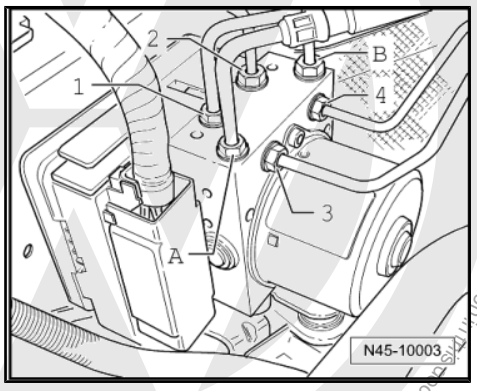
– Release connector on control unit in direction of arrow -1- and pull off -2-.



– 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 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.



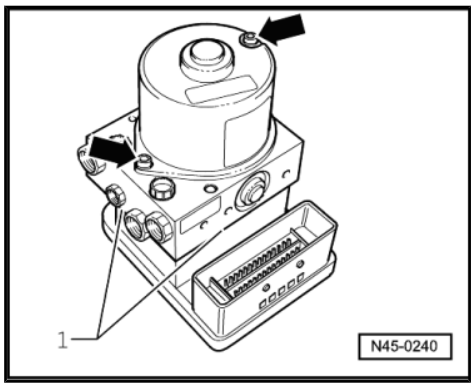
– Immediately seal brake lines and threaded holes with seal plugs from repair set Part No. 1H0 698 311 A.
– Identify brake lines (brake calipers) -1 to 4-, unscrew and seal.
– Pull hydraulic unit with control unit upwards out of dampers.

6.3.3 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 socket head bolts E5 -arrows- from hydraulic pump.

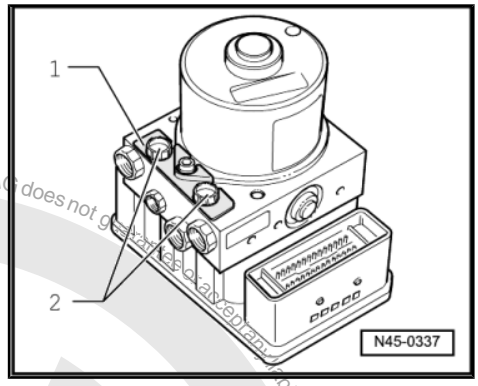


WARNING

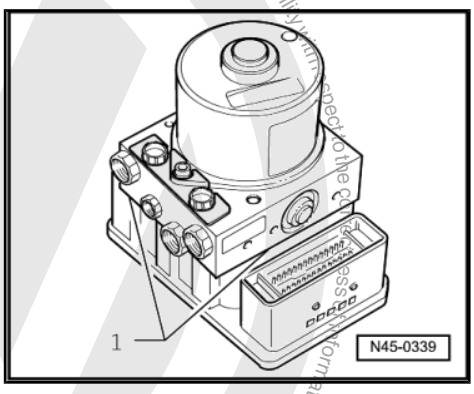
Hydraulic pump must not be separated from hydraulic unit.

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.

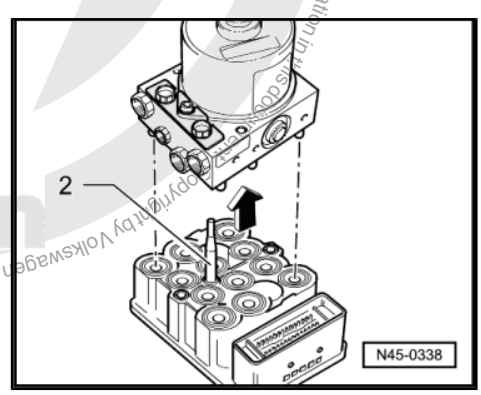


When pulling off the control unit, ensure that the hydraulic unit contact pins are not canted against the control unit solenoids.

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.



6.3.4 Installing new control unit

WARNING

Severe shocks (e.g. dropping, impact) may destroy the control unit. The 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.*

6.3.5 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.*

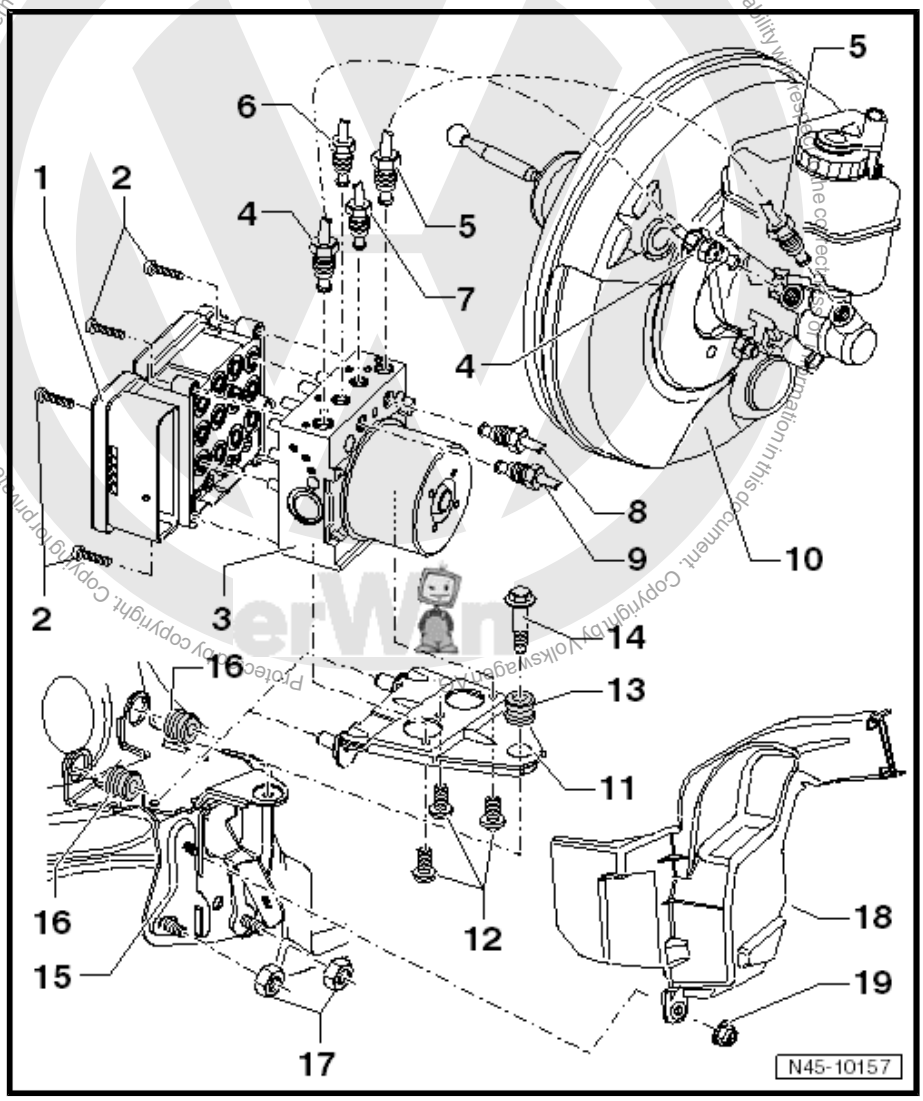
– Install in reverse order.
– Remove brake pedal depressor -V.A.G 1869/2- .
– Bleed brake system ⇒ page 130 .
– Code radio.
– Code control unit -J104- with ⇒ Vehicle diagnosis, testing and information system VAS 5051 in ”Guided fault finding”.

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:

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 M 10 x 1	14 Nm
Thread M 12 x 1	14 Nm

6.4 ABS Mark 60 (ABS/EDL/TCS/ESP) from week 22/2008



1 - ABS control unit -J104-

- ❑ Removing and installing ⇒ page 51

2 - Torx socket head bolt, 2 Nm + 0.8 Nm

- ❑ Use new bolts.

3 - ABS hydraulic unit -N55-

- ❑ Removing and installing ⇒ page 51

4 - Brake line

- ❑ From primary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: ∅ 6.5 mm and union nut with thread M 12x1.

5 - Brake line

- ❑ From secondary piston circuit of brake master cylinder to hydraulic unit
- ❑ Identification: ∅ 6.5 mm and union nut with thread M 12x1.

6 - Brake line

- ❑ To front left brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 10x1.

7 - Brake line

- ❑ To front right brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 12x1.

8 - Brake line

- ❑ To rear left brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 12x1.

9 - Brake line

- ❑ To rear right brake caliper
- ❑ Identification: ∅ 5.25 mm and union nut with thread M 10x1.

10 - Brake servo

- ❑ See ⇒ page 133 .
- ❑ Removing and installing ⇒ page 141

11 - Retainer

- ❑ Check for secure seating after installing.

12 - Torx bolt, 8 Nm

13 - Rubber damper

14 - Hexagon fitted bolt, 8 Nm

15 - Bracket

16 - Rubber damper

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

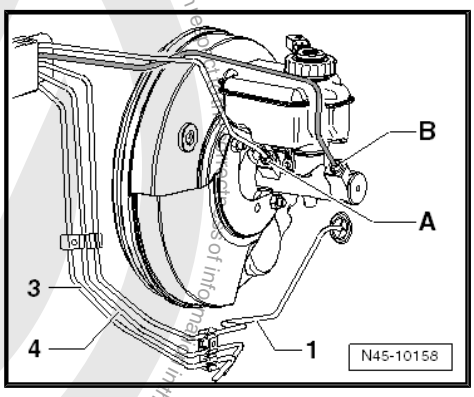
17 - Hexagon nut, 20 Nm

18 - Heat shield

19 - Hexagon nut, 8 Nm

6.4.1 Connecting brake lines from brake master cylinder to hydraulic unit

On brake master cylinder:



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

- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

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

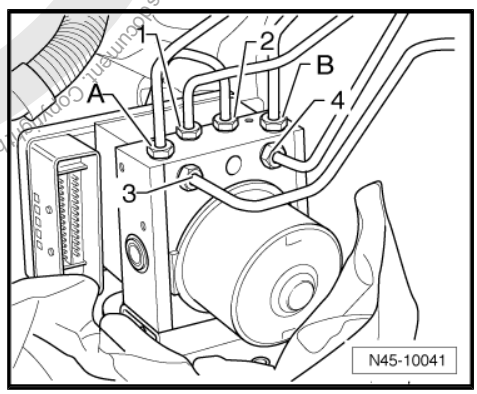
- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

1 - From hydraulic unit to front left brake caliper.

3 - Hydraulic unit to rear right brake caliper.

4 - Hydraulic unit to rear left brake caliper.

On hydraulic unit:



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

- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

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

- Identification: ∅ 6.5 mm and union nut with thread M 12x1.

1 - From hydraulic unit to front left brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 10x1.

2 - From hydraulic unit to front right brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 12x1.

3 - Hydraulic unit to rear right brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 10x1.

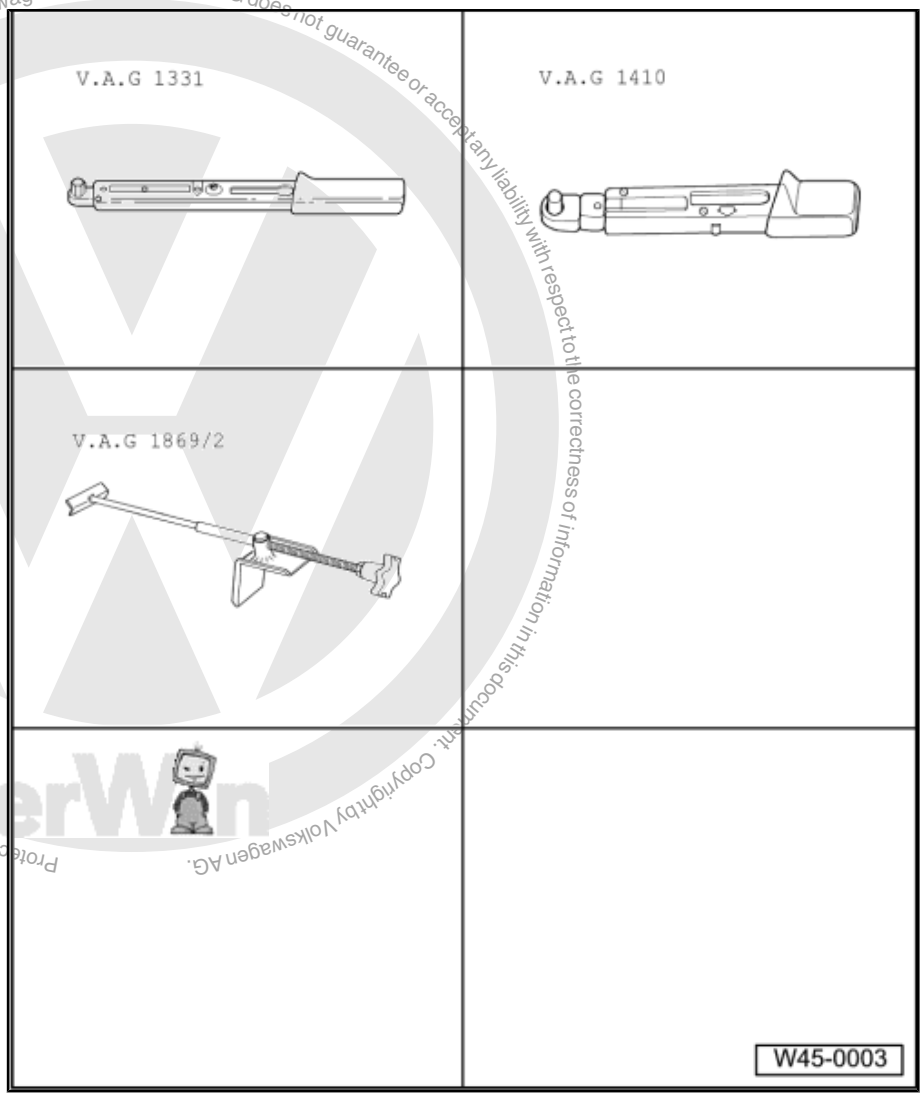
4 - Hydraulic unit to rear left brake caliper.

- Identification: ∅ 5.25 mm and union nut with thread M 12x1.

6.4.2 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-



Sealing plugs repair kit, Part No. 1H0 698 311 A

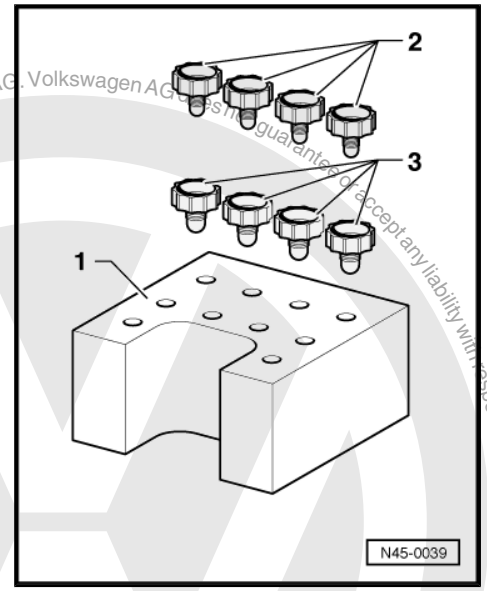
The transport protection for the contact pins must always be placed on the hydraulic unit after the control unit has been disconnected from the hydraulic unit.

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

1 - Transport protection for contact pins (foam)

2 - Sealing plug M 10

3 - Sealing plug M 12



Removing

Fitting 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.

– Note or request radio code on vehicles with coded radio if necessary.

– Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

– 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-cylinder diesel engine (2 valve); Rep. Gr. 23 ; Removing and installing mixture preparation - injection .

2.0 l diesel engine:

– Touran vehicles only: remove plenum chamber middle bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .

– Remove connecting pipe between intake hose and turbocharger.

– Remove toothed belt guard upper part.

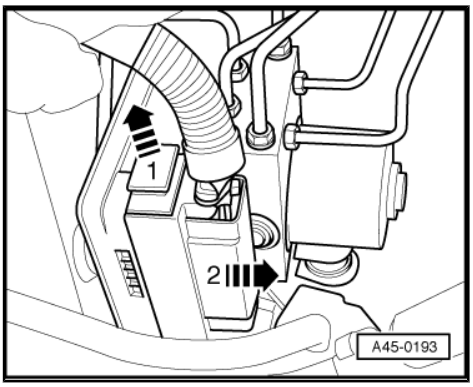
Diesel engines with diesel particulate filter:

– 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:

– Remove heat shield (if installed).

– 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 bleeder valves.

– Depress brake pedal at least 60 mm using brake pedal depressor -V.A.G 1869/2- .

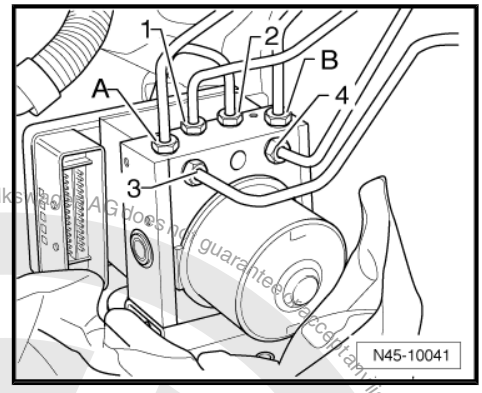
– Close front left and rear left bleeder valve.

– 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 seal plugs from repair set Part No. 1H0 698 311 A.

– Identify brake lines (brake calipers) -1 to 4-, unscrew and seal.

– Turn hexagon fitted bolt out of retainer.

– Pull hydraulic unit together with control unit and retainer sideways out of rubber dampers of bracket and turn upside down.

– Unbolt retainer from hydraulic unit in engine compartment and remove.

– Remove hydraulic unit together with control unit.

6.4.3 Unbolting control unit from hydraulic unit

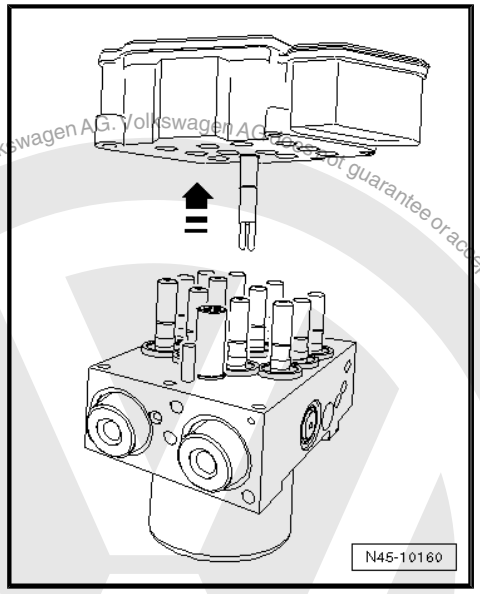
Note

– Place hydraulic unit with control unit upwards on a clean flat level surface.

– Unscrew Torx socket head 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

- ***The printed circuit board becomes visible when the control unit is removed.***
- ***No moisture or particles of dirt may enter the 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.

6.4.4 Installing new control unit

WARNING

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

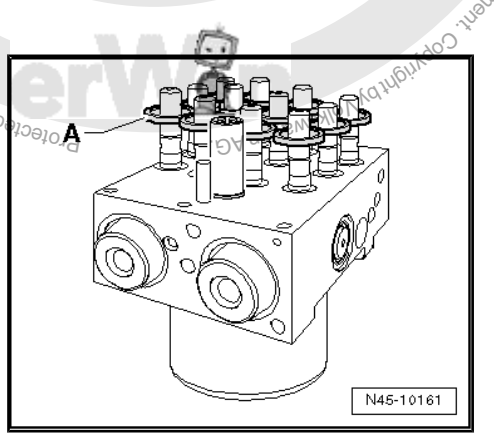
• Clean surfaces before assembling.

– 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 socket head 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.*

6.4.5 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 130 .

– Code radio.

– 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:

Control unit to hydraulic unit ♦ Use new bolts!	2 Nm + 0.8 Nm
Torx bolt of hydraulic unit to bracket	8 Nm
Hexagon fitted bolt, retainer to bracket	8 Nm
Brake lines to ABS assembly:	
Thread M 10 x 1	14 Nm
Thread M 12 x 1	14 Nm

7 Removing and installing parts of ABS system on front and rear axle

7.1 Removing and installing parts of ABS system on front axle

1 - ABS speed sensor

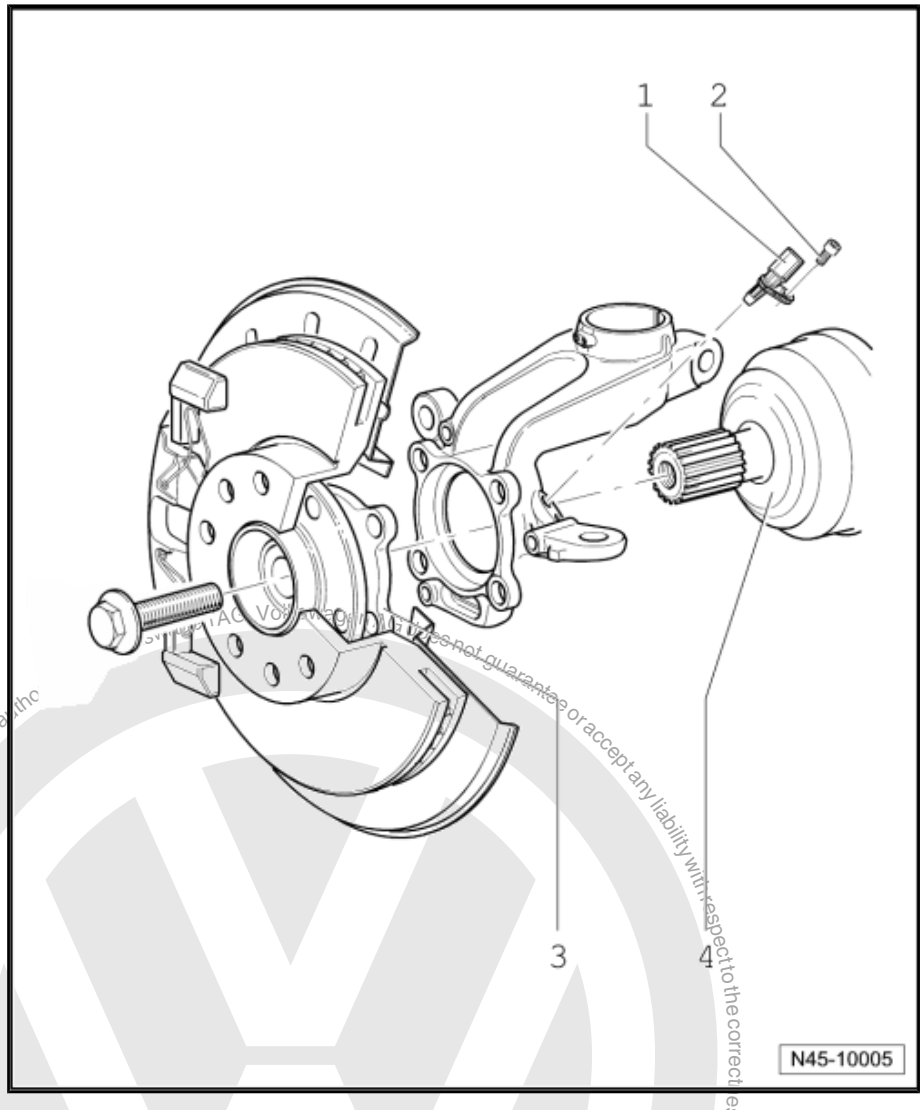
- ❑ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.
- ❑ Removing and installing ⇒ page 56

2 - Hexagon socket head bolt, 8 Nm

3 - Wheel bearing/hub unit

- ❑ ABS sensor ring is installed in the wheel bearing.

4 - Drive shaft

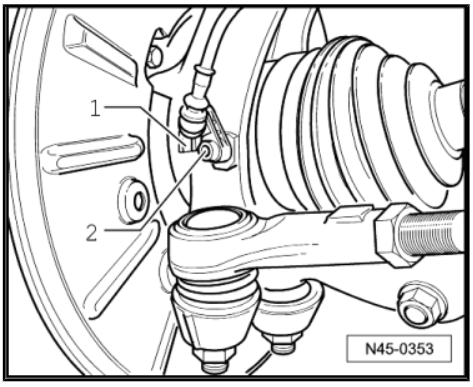


7.1.1 Removing and installing speed sensor on front axle

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 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.

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

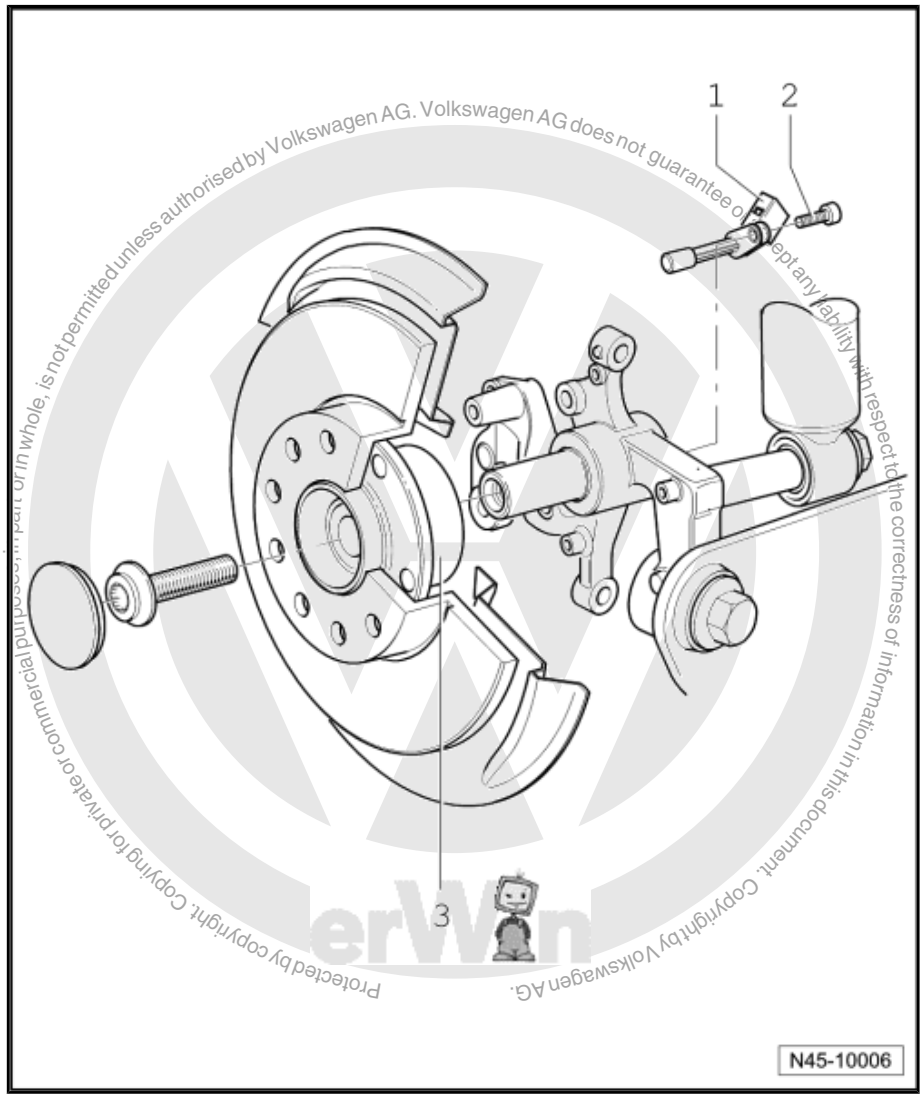
1 - ABS speed sensor

❑ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.
❑ Removing and installing ⇒ page 58

2 - Hexagon socket head bolt, 8 Nm

3 - Wheel bearing/hub unit

❑ ABS sensor ring is installed in the wheel bearing.



7.2.1 Removing and installing speed sensor on rear axle

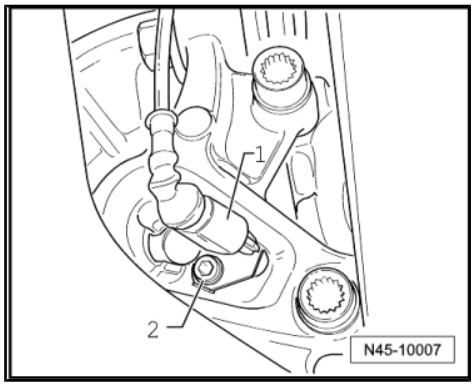
Removing

– 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 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.

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

1 - ABS speed sensor

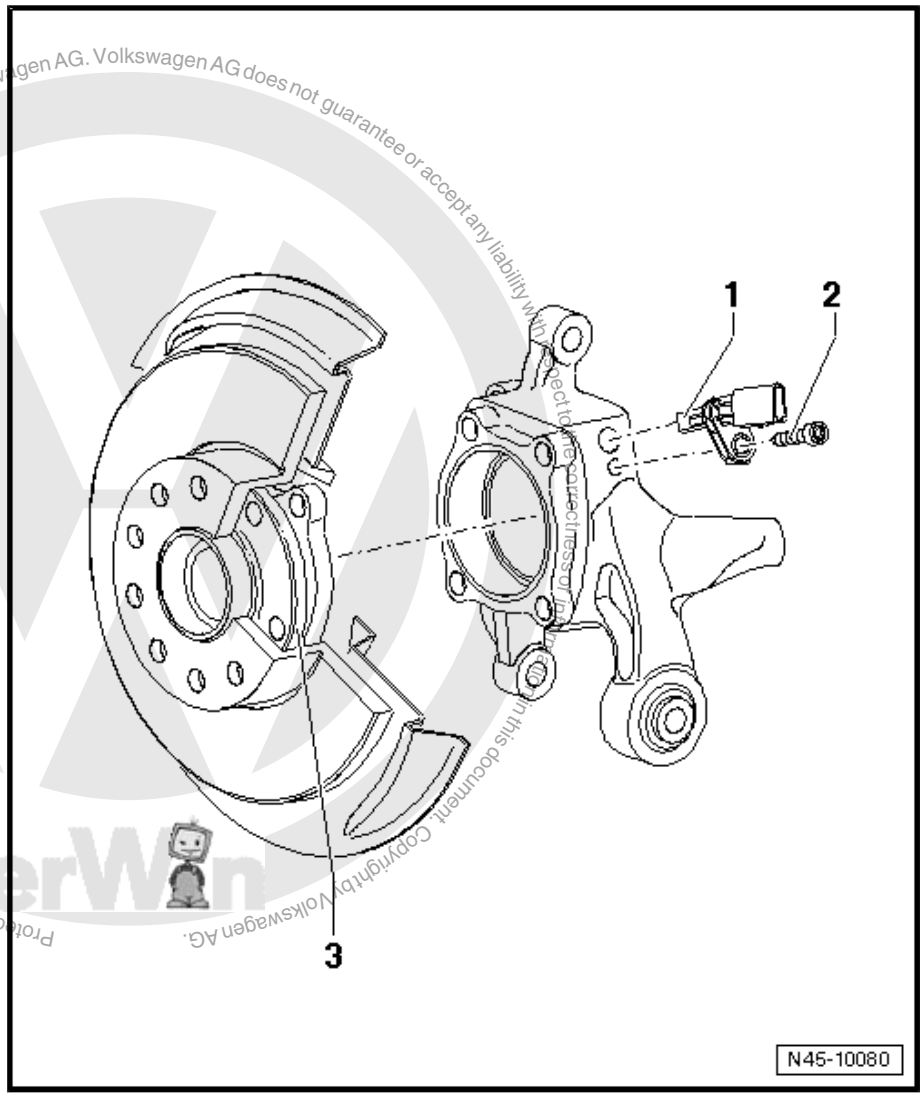
❑ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.

❑ Removing and installing ⇒ page 59

2 - Hexagon socket head bolt, 8 Nm

3 - Wheel bearing/hub unit

❑ ABS sensor ring is installed in the wheel bearing.



7.3.1 Removing and installing speed sensor on rear axle

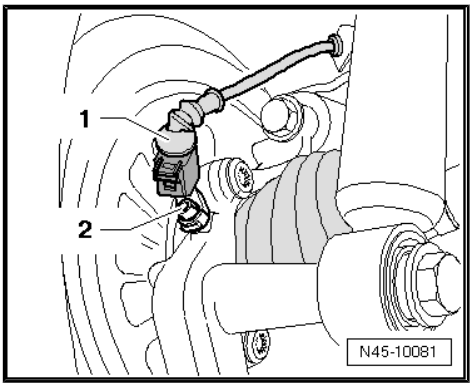
Removing

– 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.

8 Removing and installing parts of ESP system

8.1 Removing and installing ESP sensor unit -G419- (Touran)

The lateral acceleration sender -G200- , the yaw rate sender -G202- and the longitudinal acceleration sender -G251- are installed together in one housing behind the glove compartment.

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.

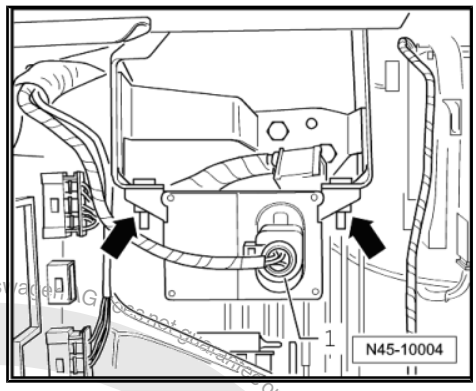
Removing

– Remove glove compartment ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .

– Pull connector -1- off ESP sensor unit -G419- .

– Remove the two securing nuts -arrows-.

– Remove ESP sensor unit -G419- .



Installing

– Install in reverse order.

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.

– Perform basic setting of lateral acceleration sender -G200- .

Connecting -VAS 5051- and selecting functions ⇒ page 13 .

8.2 Removing and installing ESP sensor unit -G419- (Golf, Eos)

The lateral acceleration sender -G200- , the yaw rate sender -G202- and the longitudinal acceleration sender -G251- are installed in a housing under the right front 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

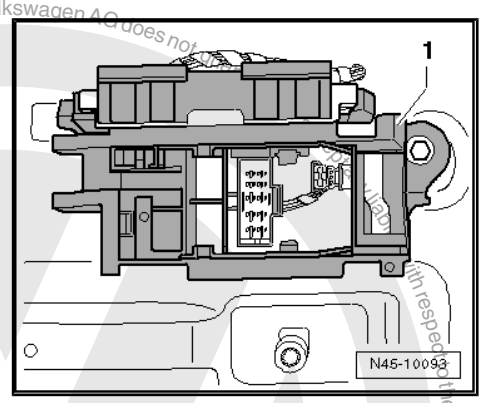
– Remove right front seat together with seat frame ⇒ General body repairs, interior; Rep. Gr. 72 .

– Remove sill panel trim ⇒ General body repairs, interior; Rep. Gr. 68 ; Sill panel trims .

– Lift carpet and lay to the side.

– Remove coupling station -1-.

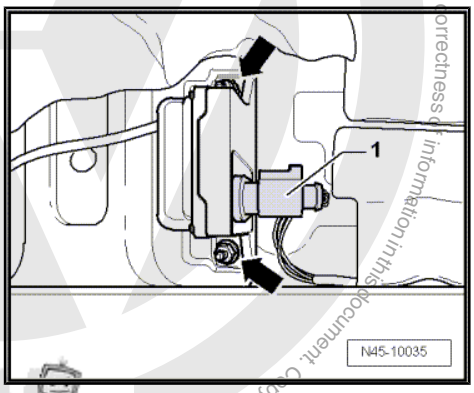
– Raise floor covering.



– Pull connector -1- off ESP sensor unit -G419- .

– Remove the two securing nuts -arrows-.

– Remove ESP sensor unit -G419- .



Installing

– Install in reverse order.

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.

– Perform basic setting of lateral acceleration sender -G200- .

Connecting -VAS 5051- and selecting functions ⇒ page 13 .

8.3 Removing and installing steering angle sender -G85-

The steering angle sender -G85- is located between the steering wheel and steering column switch.

Removing and installing

⇒ Electrical system; Rep. Gr. 94 ; Lights, bulbs, switches - exterior; Steering column switch .

– Then perform basic setting of steering angle sender -G85- .

Connecting -VAS 5051- and selecting functions ⇒ page 13 .

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 22/2008.

8.4 Removing and installing brake servo vacuum sender -G483-

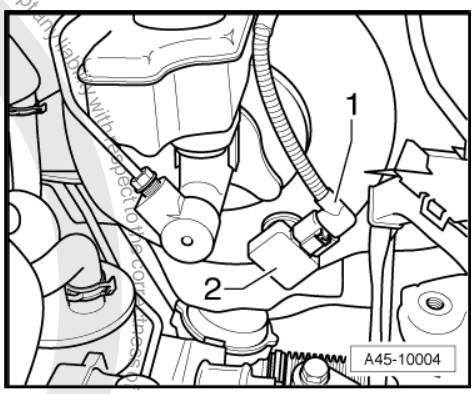
Removing

– Removing and installing battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .

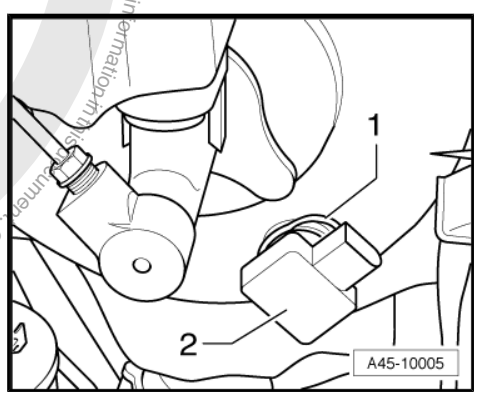
– Remove battery tray.

– 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

1.1 Repairing front brakes, FS III brake caliper

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 - Hexagon bolt / Torx bolt, 12 Nm

- ❑ M6x10 hexagon bolt revised to M6x12 Torx bolt
- ❑ Replace hexagon bolt with hexagon bolt and Torx bolt with Torx bolt

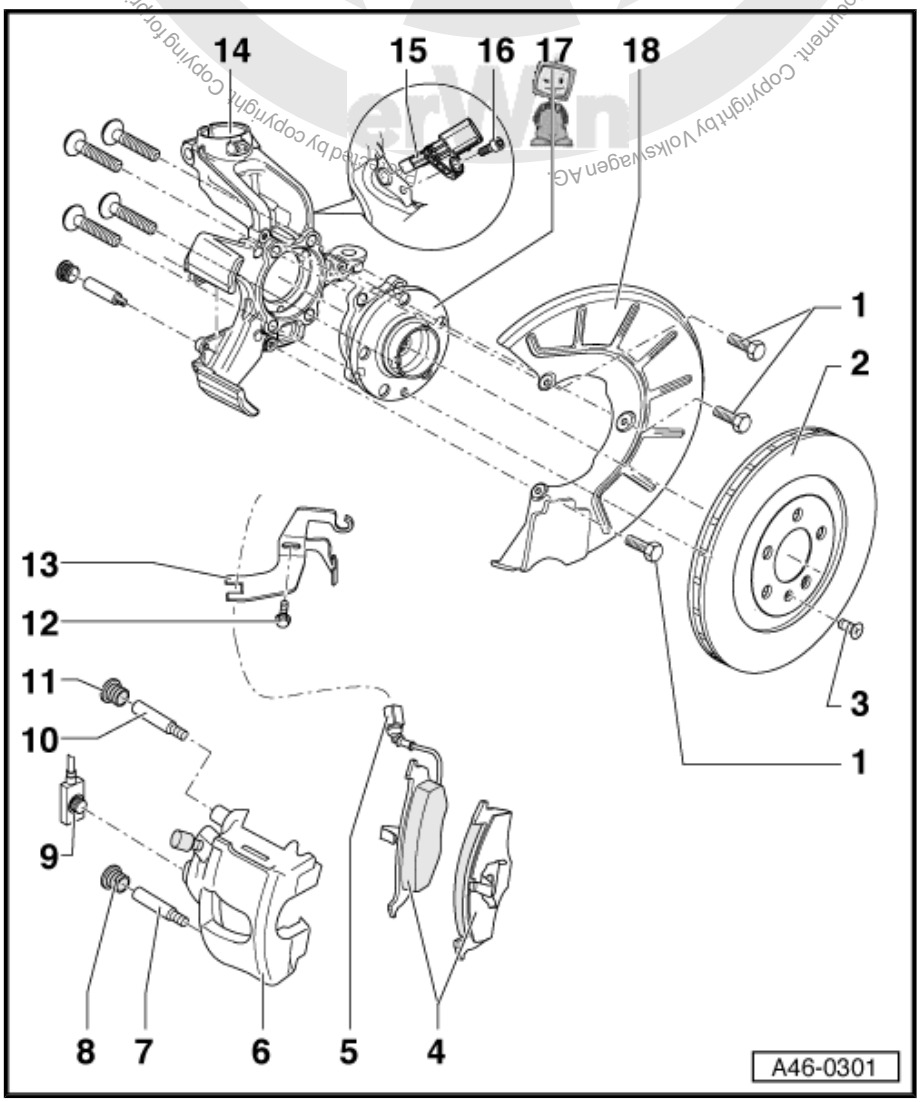
2 - Brake disc

- ❑ Ventilated, ∅ 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 without 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.
- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.



- ❑ Removing and installing ⇒ page 64

5 - Connector

- ❑ Brake pad wear indicator

6 - Brake caliper

- ❑ Do not disconnect brake hose when changing pads.
- ❑ Removing and installing ⇒ page 67
- ❑ Repairing ⇒ page 113

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

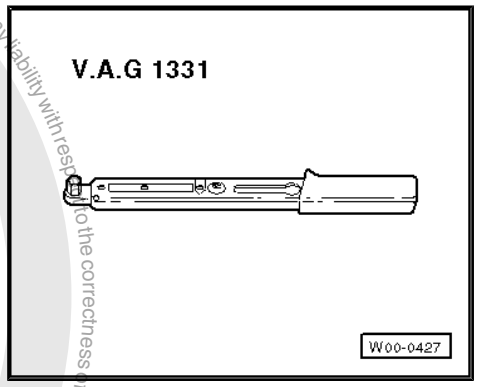
- ❑ ABS sensor ring is installed in the wheel bearing.

18 - Splash plate

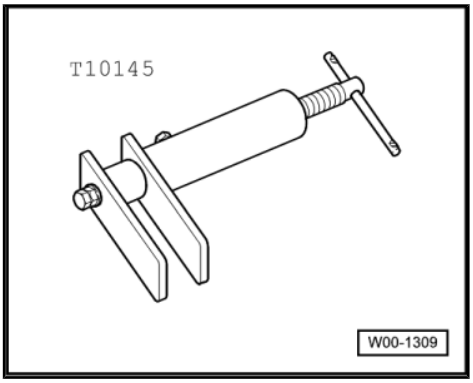
1.2 Removing and installing brake pads/linings

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-



♦ Piston resetting tool -T 10145-

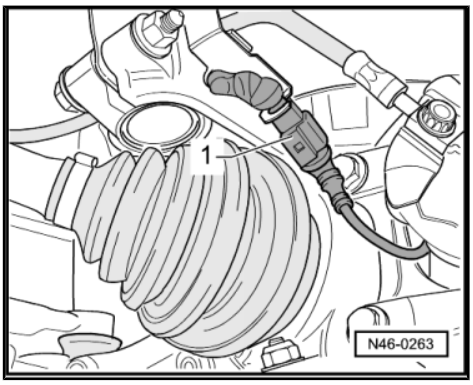


1.2.1 Removing

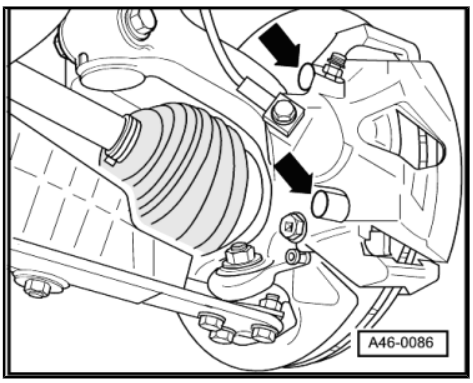
Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.

– Remove wheels.

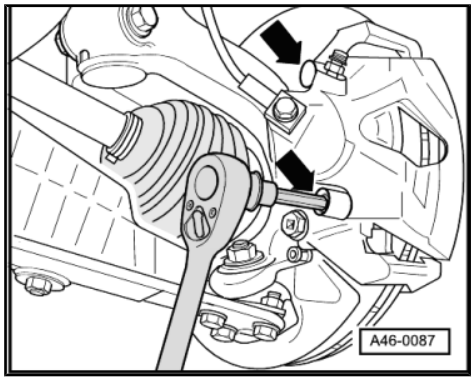
– Disconnect connector -1- for brake pad wear indicator.



– 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!***

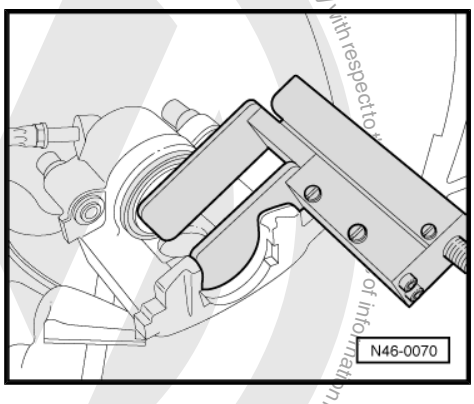
– Thoroughly clean brake carrier and contact surfaces for brake pads and remove corrosion.
– Clean brake caliper.

Use only methylated spirits for cleaning the brake caliper housing.

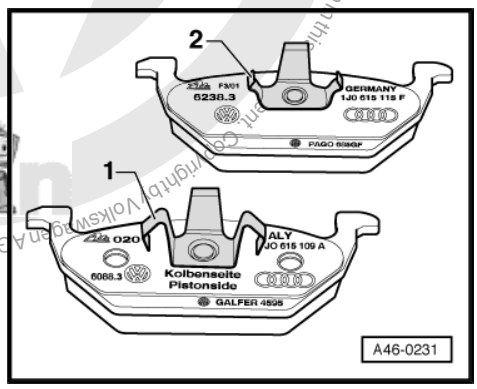
1.2.2 Installing

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.

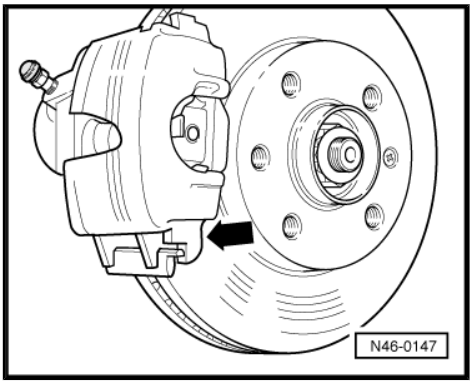
– Press piston back.



– 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).

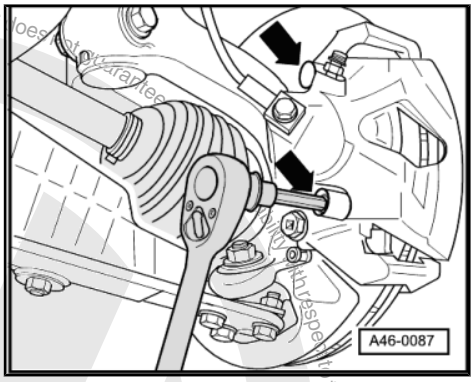


– First position brake caliper with brake pads at bottom -arrow- of brake carrier.



– 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 ⇒ 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.*

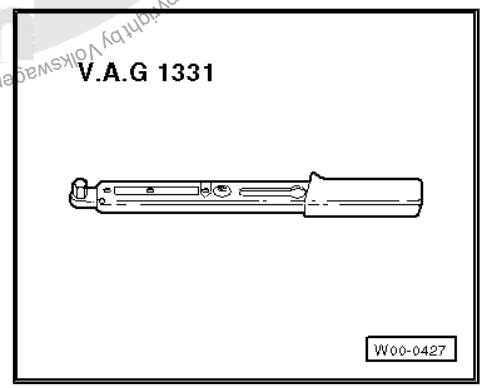
♦ *Check brake fluid level after changing brake pads.*

Specified torque:	
Guide pin to brake carrier	30 Nm

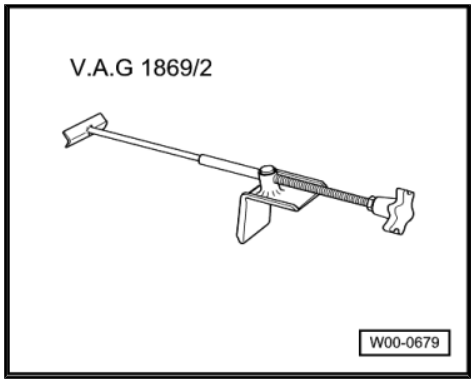
1.3 Removing and installing brake caliper

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



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



1.3.1 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 cover caps out of sleeve bearings of brake caliper.

– Loosen both guide pins and remove from brake caliper.

– Pull brake caliper off brake carrier.

– Remove brake pads from brake caliper.

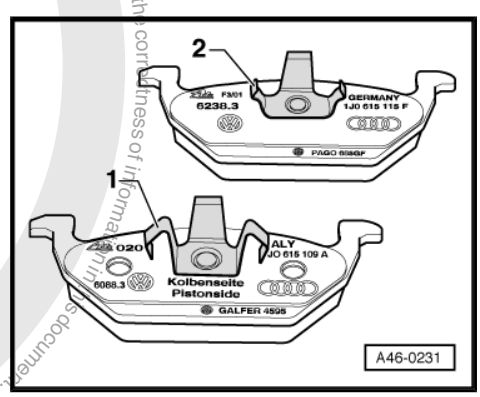
1.3.2 Installing

• Piston is pressed back.

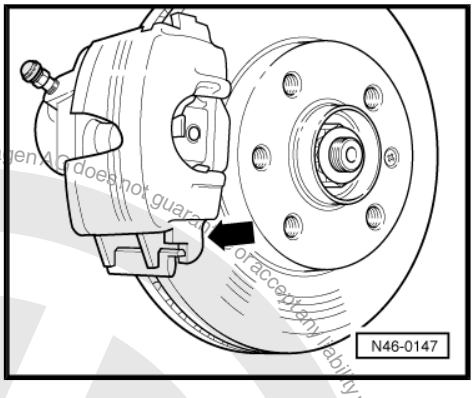
– Insert inner brake pad (piston side) -1- and outer brake pad -2- into brake caliper with retaining springs.

♦ 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.

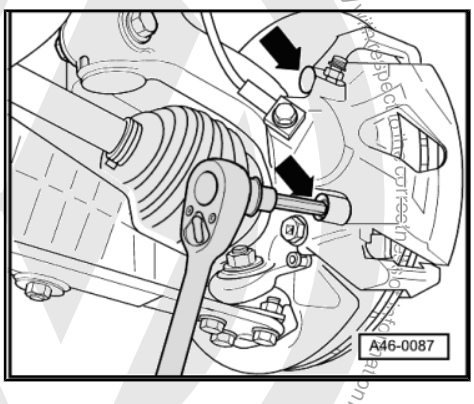
– Bolt brake hose to brake caliper.

– Remove brake pedal depressor -V.A.G 1869/2- .

– Reconnect connector for brake pad wear indicator.

– Bleed brake system ⇒ page 130 .

– 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:	
Guide pin to brake carrier	30 Nm
Brake hose to brake caliper	35 Nm

1.4 Repairing front brake, FN 3 brake caliper

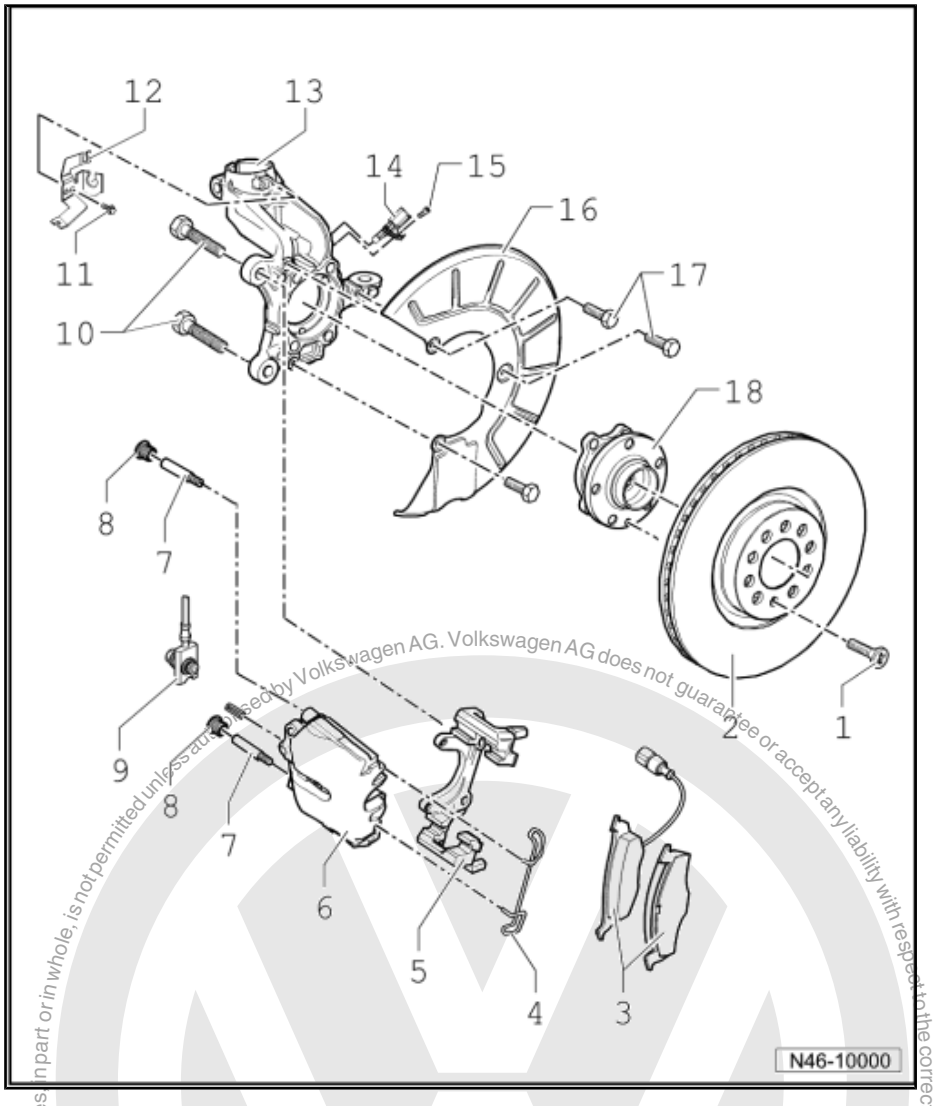
Note

♦ *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).*

Assembly overview, FN3, 15 inches:



1 - Cross head screw / Torx screw, 4 Nm

2 - Brake disc

- ❑ Ventilated, ∅ 288 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 - Brake pads

- ❑ Thickness: 14 mm without 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.
- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ page 72

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 75
- ❑ Repairing ⇒ page 113

7 - Guide pin, 30 Nm

8 - Cover cap

- ❑ Remove

9 - Brake hose with banjo union and banjo bolt, 35 Nm

10 - Ribbed 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 hole inner surface and coat with high-temperature paste G 052 112 A3.

15 - Hexagon socket head bolt, 8 Nm

16 - Splash plate

17 - Hexagon bolt / Torx bolt, 12 Nm

- ❑ M6x10 hexagon bolt revised to M6x12 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 the wheel bearing.

Assembly overview, FN3, 16 inches:

1 - Torx bolt, 12 Nm

2 - Brake disc

- ❑ Ventilated, ∅ 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.

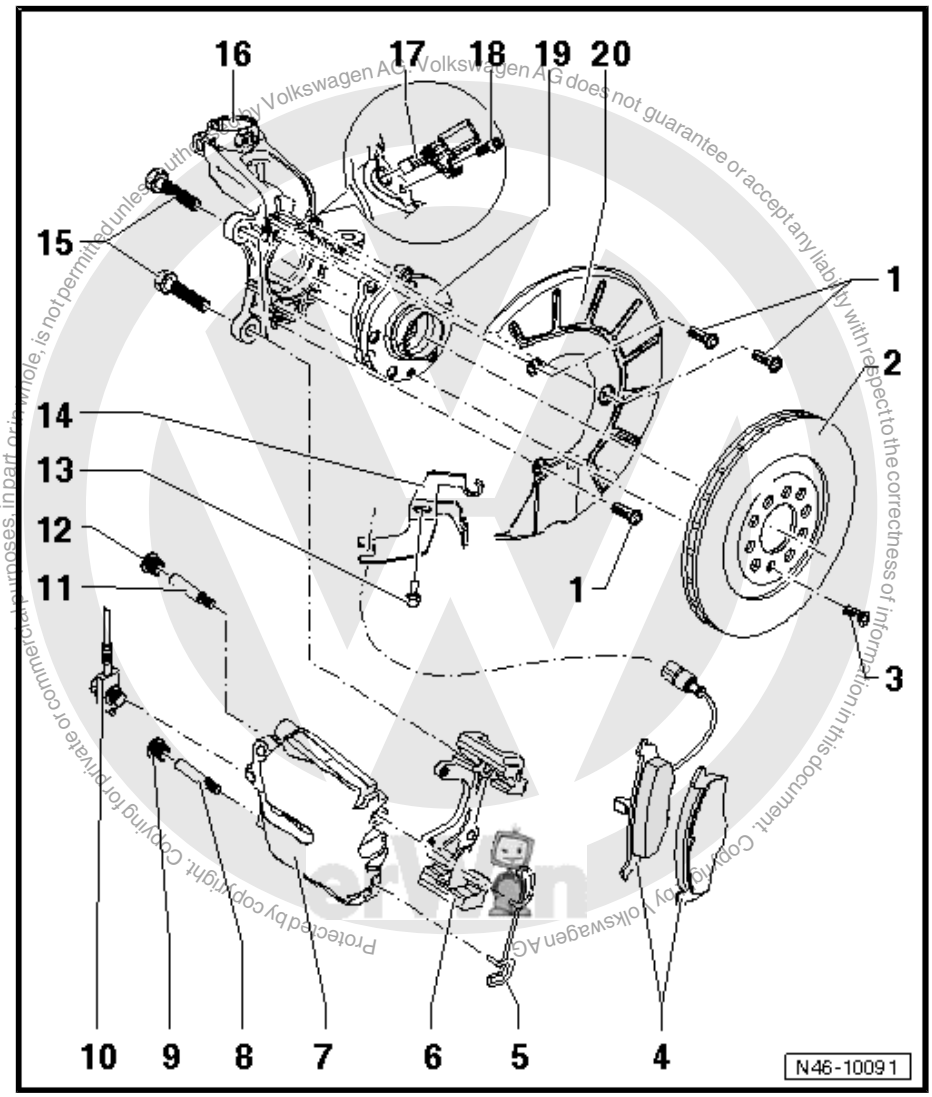
3 - Torx bolt, 4 Nm

4 - Brake pads

- ❑ Thickness: 14 mm without 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.
- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ page 72

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 ⇒ page 75
- ❑ Repairing ⇒ page 113

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 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

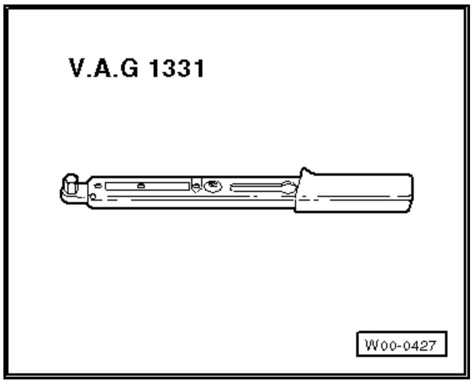
- ❑ ABS sensor ring is installed in the wheel bearing.

20 - Splash plate

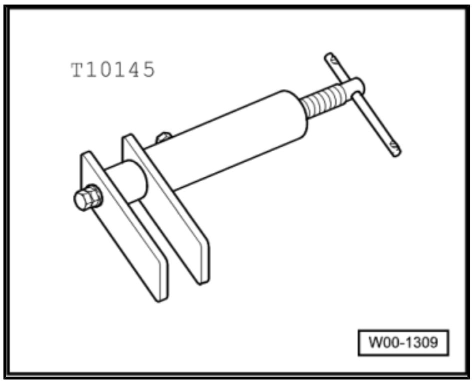
1.5 Removing and installing brake pads/linings

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-



- ♦ Piston resetting tool -T 10145-

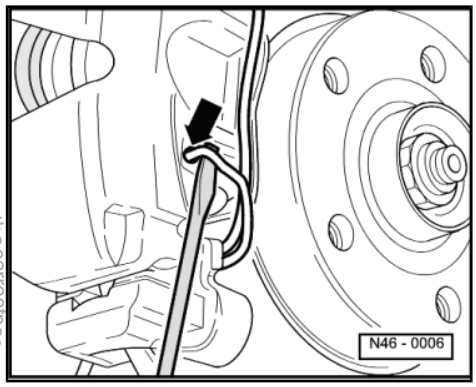


1.5.1 Removing

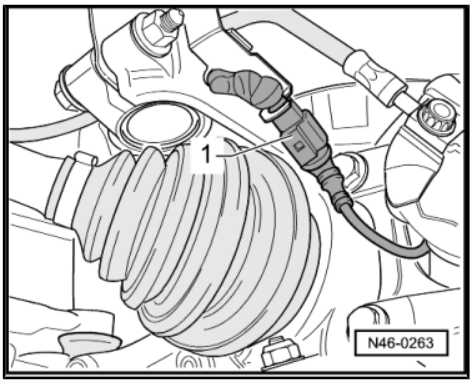
Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.

– Remove wheels.

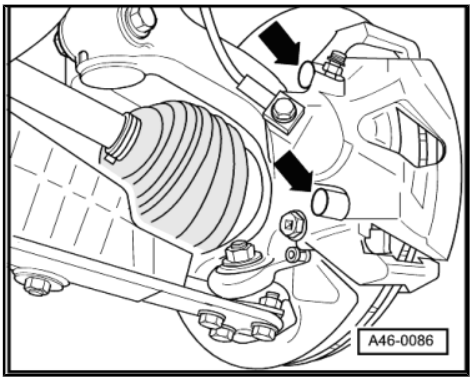
– Lever brake pad retaining spring out from brake caliper -arrow- with a screwdriver and remove.



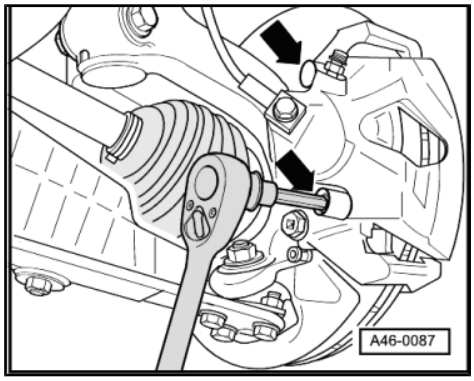
– Disconnect connector -1- for brake pad wear indicator.



– 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!***

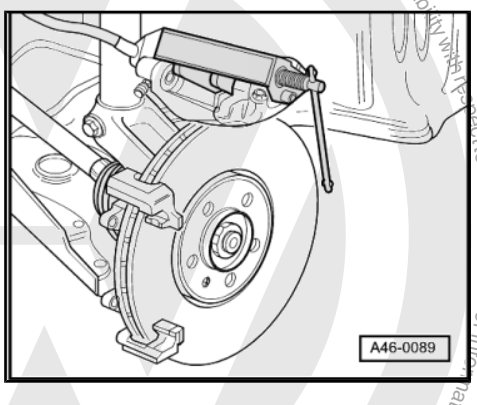
– Thoroughly clean brake carrier and contact surfaces for brake pads and remove corrosion.
– Clean brake caliper, in particular the bonding surface for the brake pad. It must be free of adhesive and grease residues.

Use only methylated spirits for cleaning the brake caliper housing.

1.5.2 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.

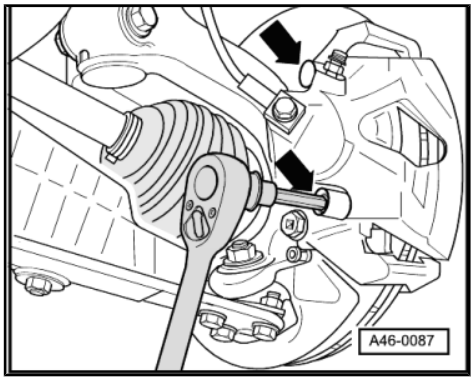
– Press piston back.
– Pull protective foil off outer brake pad backplate.
– Fit outer brake pad to brake carrier.
– Insert inner brake pad with retaining spring into brake caliper (piston).



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 of wheel bolts .

Note

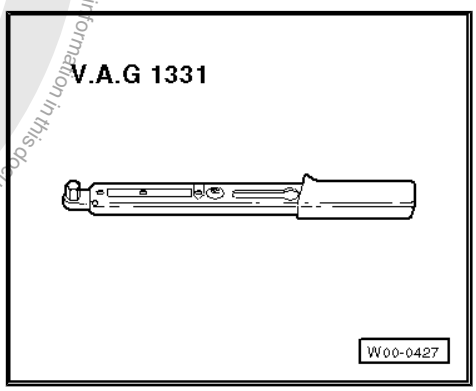
- *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.*
- *Check brake fluid level after changing brake pads.*

Specified torque:	
Guide pin to brake carrier	30 Nm

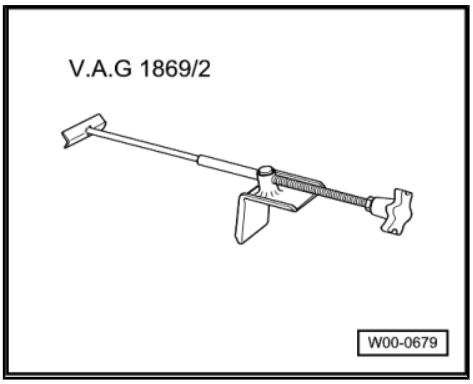
1.6 Removing and installing brake caliper

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331-



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



1.6.1 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 cover caps out of sleeve bearings of brake caliper.
– Loosen both guide pins and remove from brake caliper.
– Pull brake caliper off brake carrier.
– Remove brake pads from brake caliper.

1.6.2 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 130 .
– Fit wheels.

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

Note

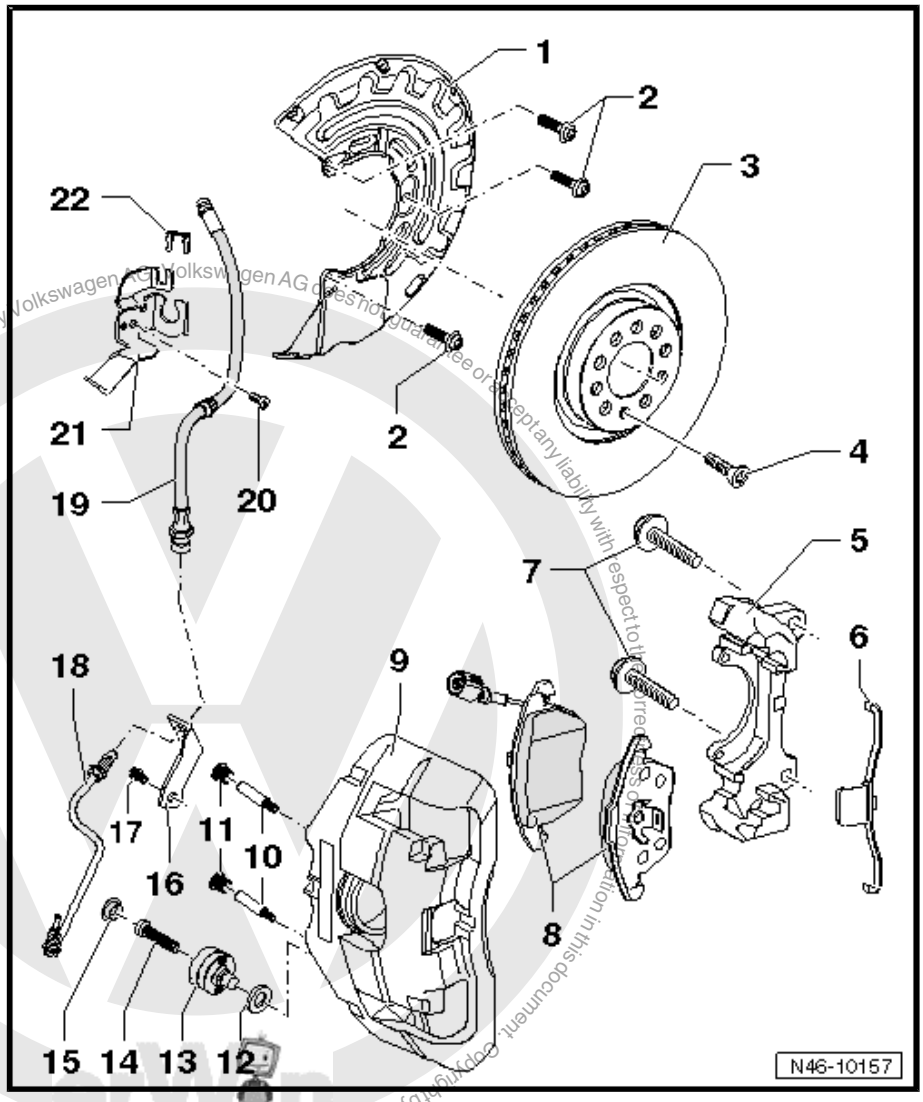
- *Firmly depress brake pedal several times with vehicle stationary, so that the brake pads are properly seated in their normal operating position.*
- *Check brake fluid level.*

Specified torques:	
Guide pin to brake carrier	30 Nm
Brake hose to brake caliper	35 Nm

1.7 Repairing front brake, FNR-G brake caliper

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 - Splash plate

2 - Torx bolt, 12 Nm

3 - Brake disc

- ❑ Ventilated, ∅ 345 mm
- ❑ Thickness: 30 mm
- ❑ Wear limit: 27 mm
- ❑ Always renew on both sides of an axle.
- ❑ Remove brake caliper and brake carrier prior to removing.

4 - Torx bolt, 4 Nm

5 - Brake carrier

- ❑ Bolt to wheel bearing housing.

6 - Retaining spring

- ❑ Insert into brake pad retaining spring and press under brake carrier.

7 - Ribbed bolt, 190 Nm

- ❑ Clean if reused.

8 - Brake pads

- ❑ Thickness: 14 mm without 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.
- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ page 78

9 - Brake caliper

- ❑ Do not disconnect brake hose when changing brake pads.
- ❑ Must not be unbolted from one another.
- ❑ Removing and installing ⇒ page 81
- ❑ Repairing ⇒ page 119

10 - Guide pin, 30 Nm

11 - Cover cap

- ❑ Remove

12 - Washer

13 - Balance weight

14 - Bolt, 10 Nm

15 - Dust cap

16 - Retainer

17 - Bolt, 15 Nm

18 - Brake line, 14 Nm

19 - Brake hose

20 - Hexagon socket head bolt, 8 Nm

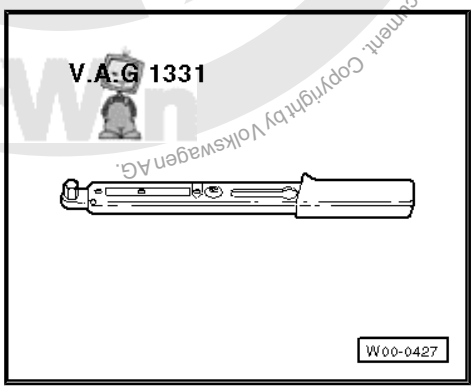
21 - Retainer

22 - Spring clip

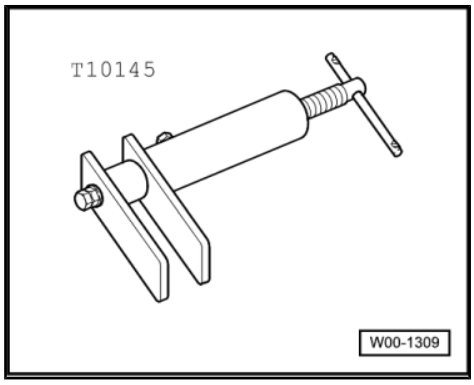
1.8 Removing and installing brake pads/linings

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-



- ♦ Piston resetting tool -T 10145-



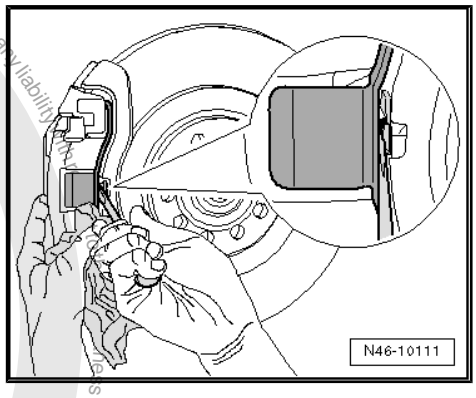
1.8.1 Removing

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

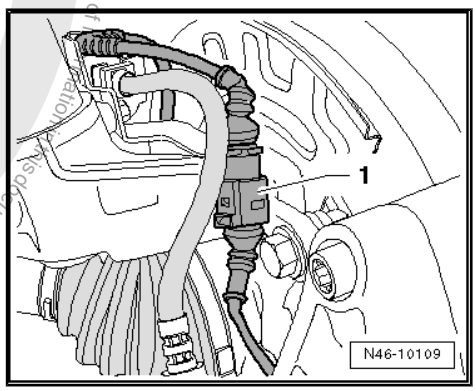
– Remove wheels.

– Lever brake caliper retaining spring out of brake pad retaining spring using a screwdriver. To do this, position screwdriver between the two retaining springs -enlargement-.

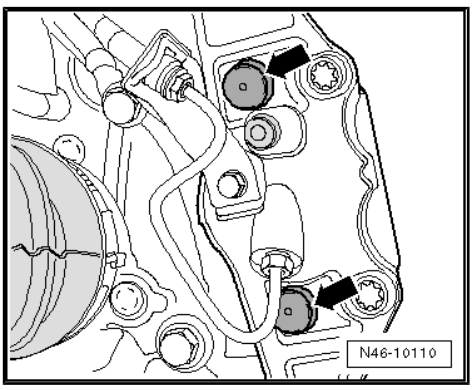
– Firmly hold brake caliper retaining spring with a cloth to prevent loss.



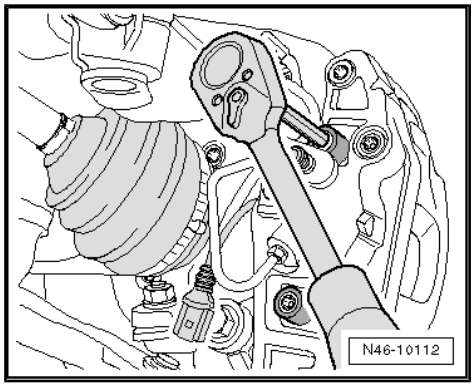
– Disconnect connector -1- for brake pad wear indicator.



– 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!***

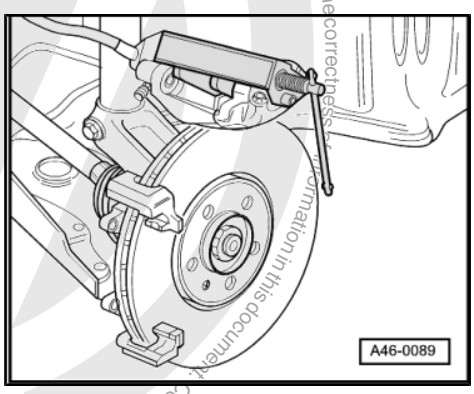
– Thoroughly clean brake carrier and contact surfaces for brake pads and remove corrosion.
– Clean brake caliper.

Use only methylated spirits for cleaning the brake caliper housing.

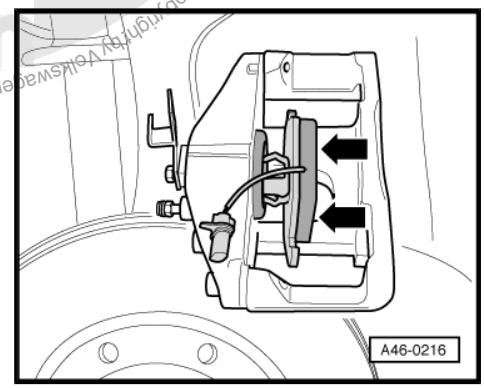
1.8.2 Installing

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.

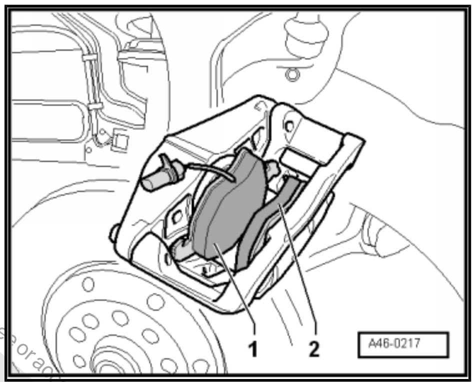
– Press piston back.



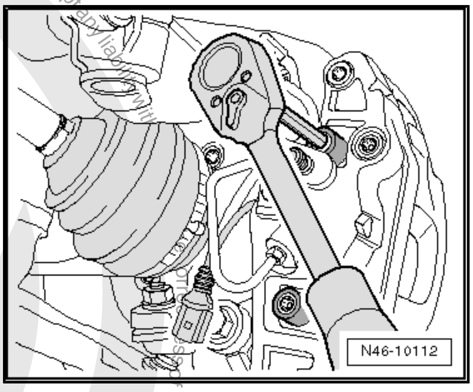
– Insert inner brake pad with retaining spring into brake caliper (piston).



– Insert outer brake pad -2- with retaining spring in caliper.
– Fit brake caliper with brake pads onto brake carrier.



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



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

Note

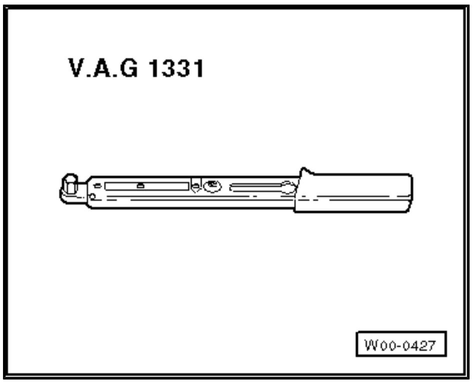
♦ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.*
♦ *Check brake fluid level after changing brake pads.*

Specified torque:	
Guide pin to brake carrier	30 Nm

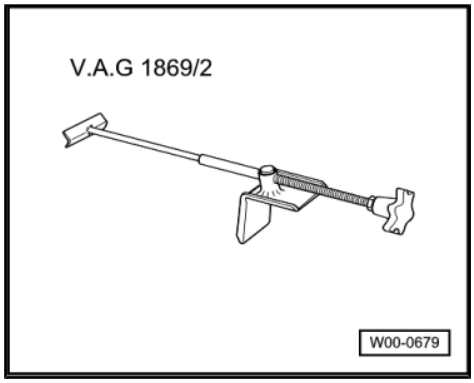
1.9 Removing and installing brake caliper

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



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



1.9.1 Removing

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

– Remove wheels.
– Lever brake caliper retaining spring out of brake pad retaining spring using a screwdriver. To do this, position screwdriver between both retaining springs.
– Firmly hold brake caliper retaining spring with a cloth to prevent loss.
– 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 cover caps out of sleeve bearings of brake caliper.
– Loosen both guide pins and remove from brake caliper.
– Pull brake caliper off brake carrier.
– Remove brake pads from brake caliper.

1.9.2 Installing

• Piston is pressed back.
– Insert inner brake pad with retaining spring into brake caliper (piston).
– Insert outer brake pad with retaining spring in brake caliper.
– Fit brake caliper with brake pads onto brake carrier.
– Bolt brake caliper to brake carrier with both guide pins.
– Fit both cover caps.
– Connect brake hose to brake line from brake caliper.
– Remove brake pedal depressor -V.A.G 1869/2- .
– Insert brake caliper retaining spring into brake pad retaining spring and press under brake carrier.
– Reconnect connector for brake pad wear indicator.
– Bleeding brake system
– 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.*

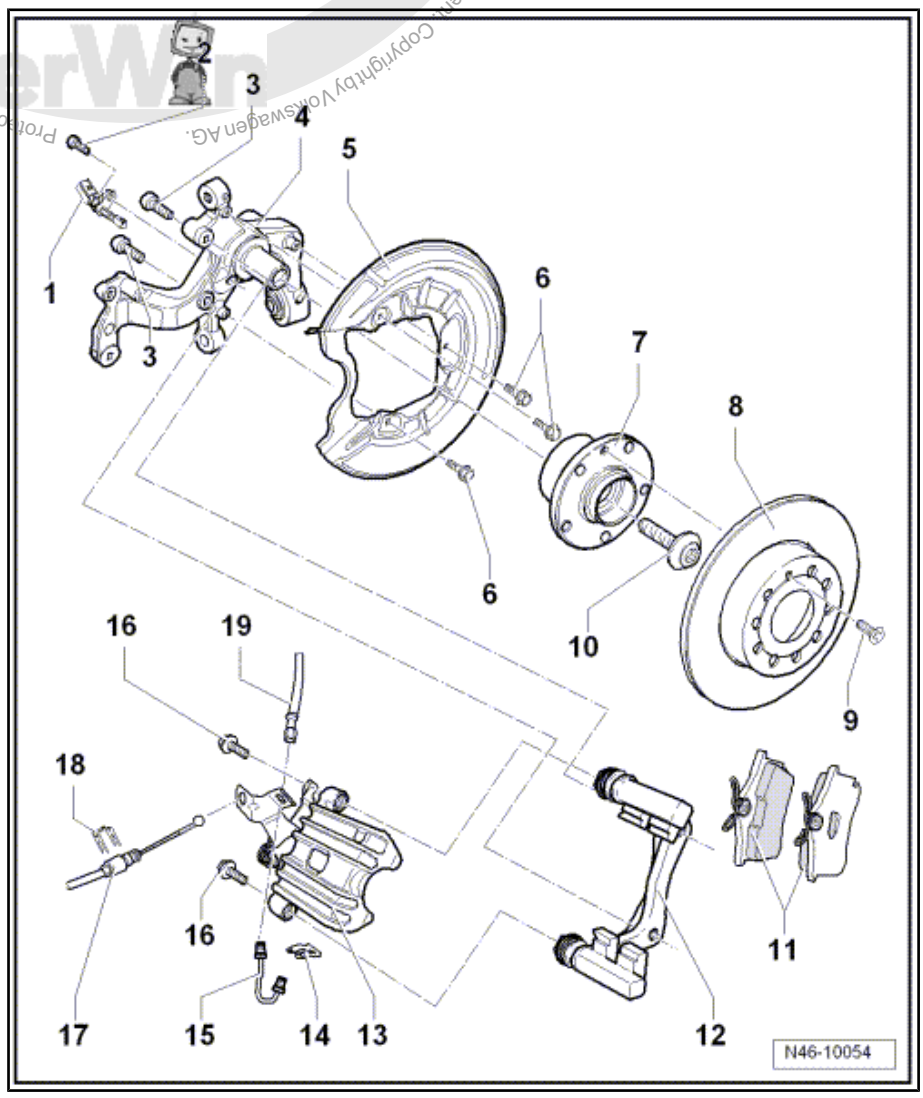
Specified torques:	
Guide pin to brake carrier	30 Nm
Brake hose to brake line	14 Nm

2 Repairing rear brake

2.1 Repairing rear brake CI 38

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 - ABS speed sensor

- ❑ Before inserting sensor, clean hole inner surface and coat with high-temperature 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 / Torx bolt, 12 Nm

- ❑ M6x10 hexagon bolt revised to M6x12 Torx bolt
- ❑ Replace hexagon bolt with hexagon bolt and Torx bolt with Torx bolt

7 - Wheel bearing/hub unit

8 - Brake disc

- ❑ ∅ 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

11 - Brake pads

- ❑ Thickness: 11 mm without backplate

- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ page 85

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 87
- ❑ Repairing ⇒ page 124
- ❑ Adjust handbrake cable first after repairing or replacement.
- ❑ Adjusting handbrake ⇒ page 101 .

14 - Hose retainer

15 - Brake line, 14 Nm

16 - Self-locking hexagon bolt, 35 Nm

- ❑ Renew.

17 - Handbrake cable

- ❑ Adjusting handbrake ⇒ page 101 .

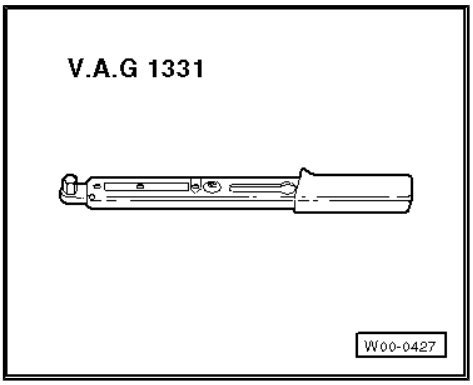
18 - Spring clip

19 - Brake hose

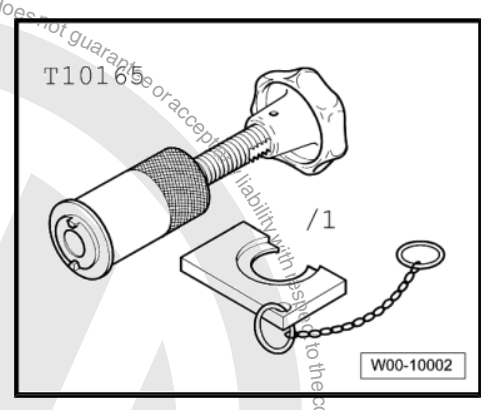
2.2 Removing and installing brake pads/linings

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1331-



- Resetting and removal tool -T 10165-



2.2.1 Removing

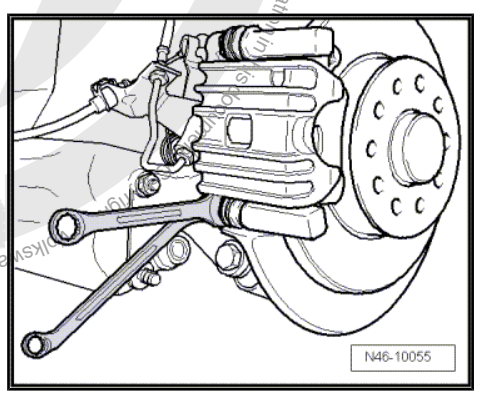
Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.

– 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.

2.2.2 Installing

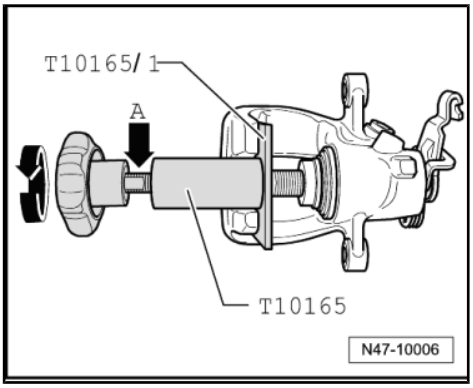
Before pressing pistons back, draw off some brake fluid from reservoir with a bleeder bottle. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.

– Screw in piston by turning knurled wheel of resetting and removal 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, use a 13 mm open jaw spanner on flats -arrow A- provided for this purpose.

– Pull protective foil off backing plates for brake pads.



– Insert brake pads into brake carrier.

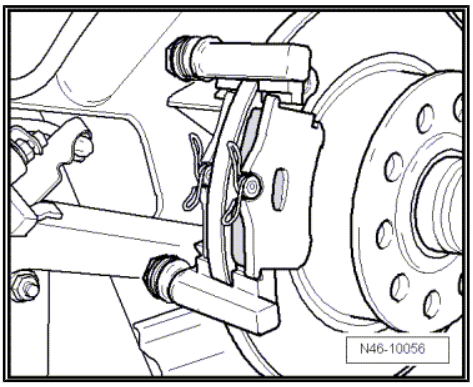
When positioning the brake caliper, ensure that the brake pads do not stick to the brake caliper before it is positioned correctly.

– 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 torque:

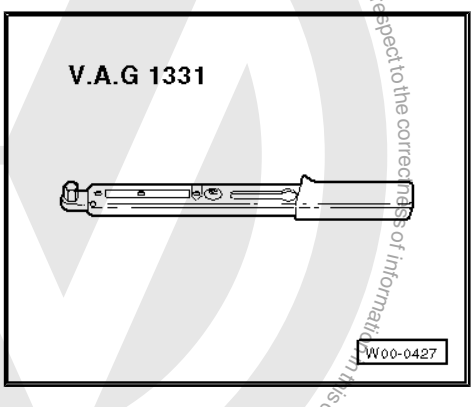
Hexagon bolt, brake caliper to brake carrier	35 Nm

♦ Use new bolts!

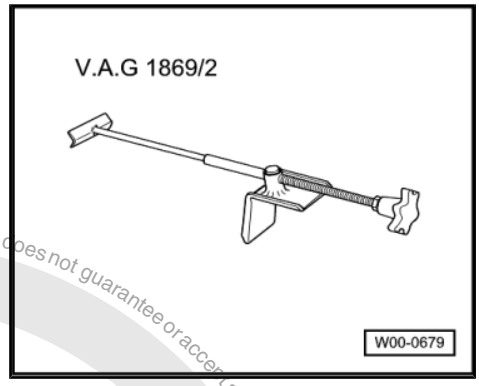
2.3 Removing and installing brake caliper

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



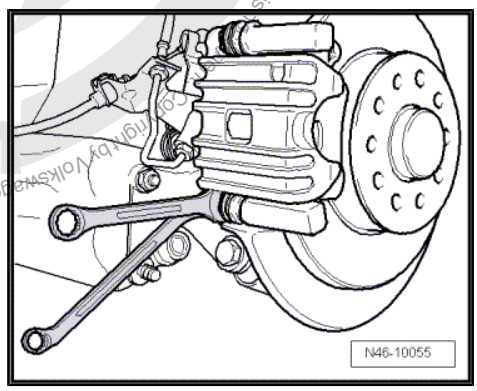
♦ Brake pedal depressor -V.A.G 1869/2-



2.3.1 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.



2.3.2 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 130 .
– 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.*

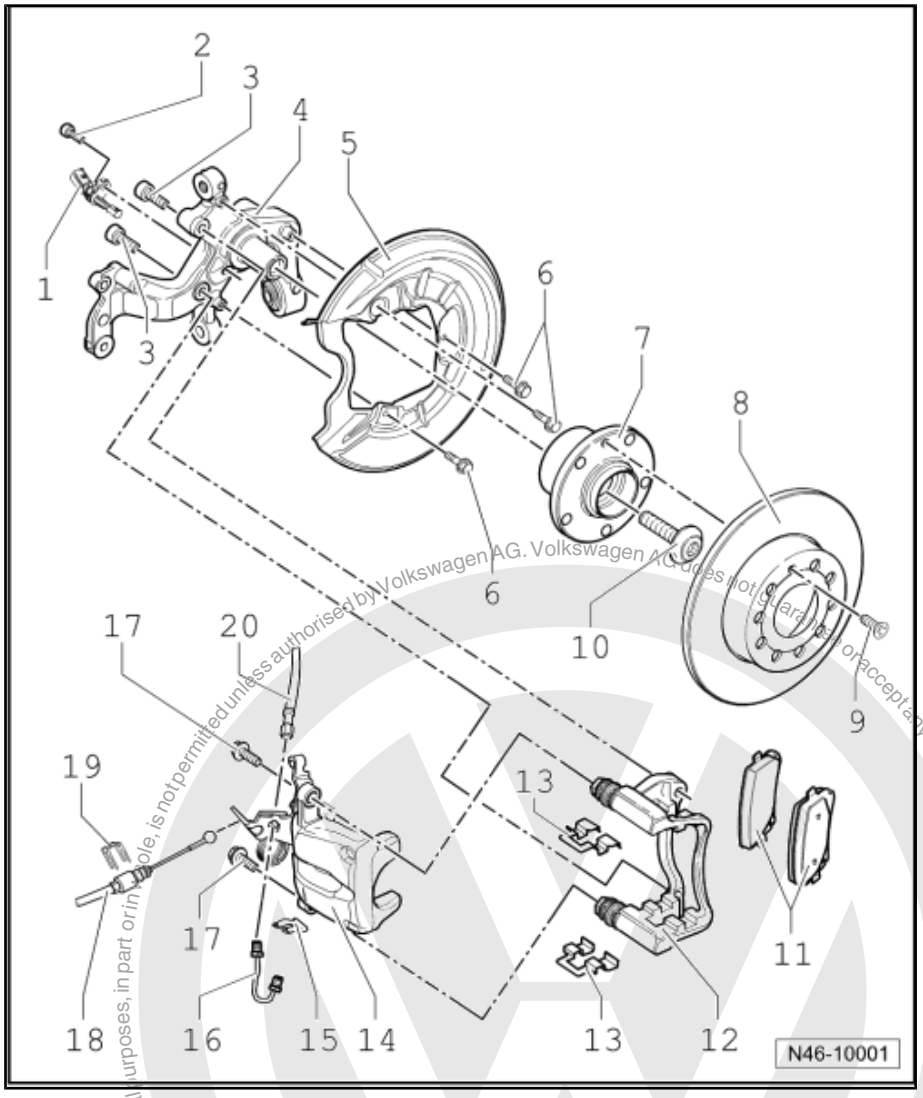
Specified torques:

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

2.4 Repairing rear brake CII 38

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 - ABS speed sensor

- ❑ Before inserting sensor, clean hole inner surface and coat with high-temperature 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 - Torx bolt, 12 Nm

7 - Wheel bearing/hub unit

8 - Brake disc

- ❑ ∅ 286 mm
- ❑ Thickness: 12 mm
- ❑ Wear limit: 10 mm
- ❑ When worn, renew on both sides of axle.
- ❑ Unscrew brake caliper prior to removing.

9 - Cross-head screw, 4 Nm

10 - Bolt

- ❑ Front-wheel drive only

11 - Brake pads

- ❑ Thickness: 11 mm without backplate
- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ page 91

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 - Pad retainer

- ❑ Always renew when changing pads.

14 - Brake caliper

- ❑ Do not disconnect brake hose when changing pads.
- ❑ Removing and installing ⇒ page 93
- ❑ Repairing ⇒ page 124
- ❑ Adjust handbrake cable first after repairing or replacement.
- ❑ Adjusting handbrake ⇒ page 101 .

15 - Hose retainer

16 - Brake line, 14 Nm

17 - Self-locking hexagon bolt, 35 Nm

❑ Renew.

18 - Handbrake cable

❑ Adjusting handbrake ⇒ page 101 .

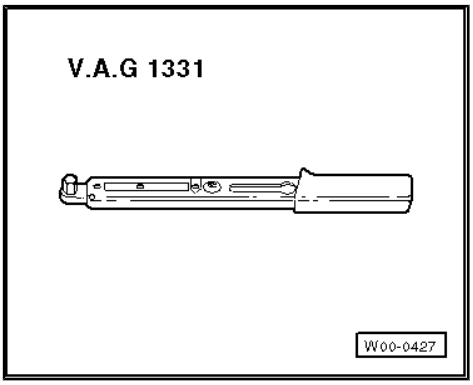
19 - Spring clip

20 - Brake hose

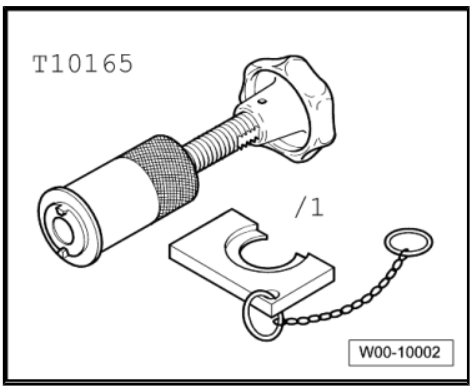
2.5 Removing and installing brake pads/linings

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



♦ Resetting and removal tool -T 10165-

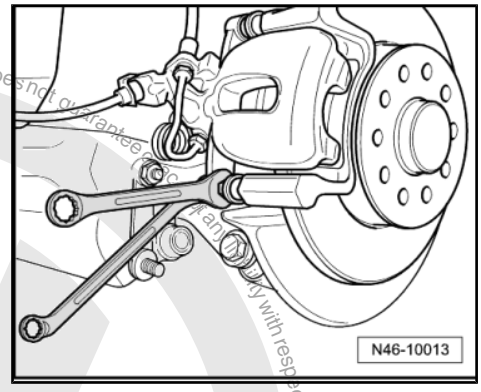


2.5.1 Removing

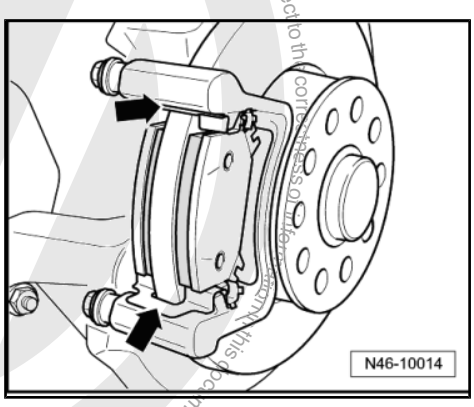
Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.

– 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!

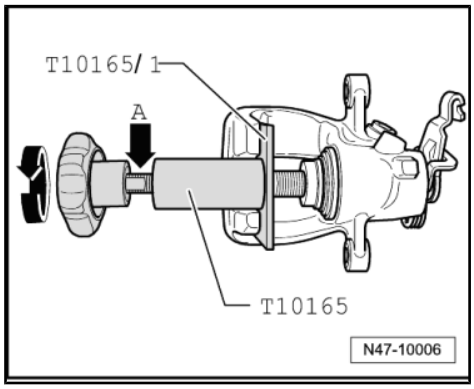
– Thoroughly clean contact surfaces for pad retainers (brake pads) on brake carrier, and remove corrosion.
– Clean brake caliper.

Use only methylated spirits for cleaning the brake caliper housing.

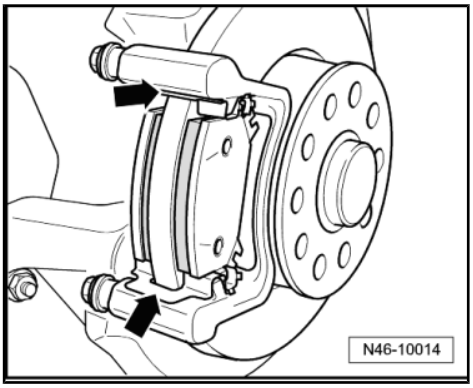
2.5.2 Installing

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 resetting and removal 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, use a 13 mm open jaw spanner on flats -arrow A- provided for this purpose.



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

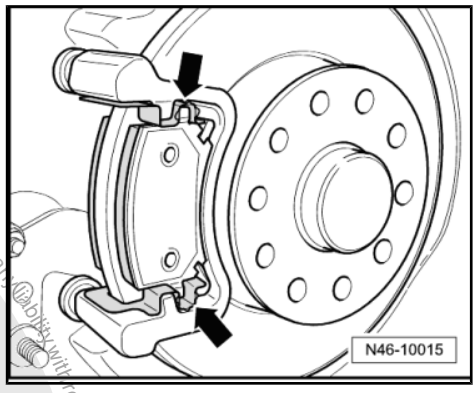


– Ensure that brake pads are seated correctly in pad retainers -arrows-.

– 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.*

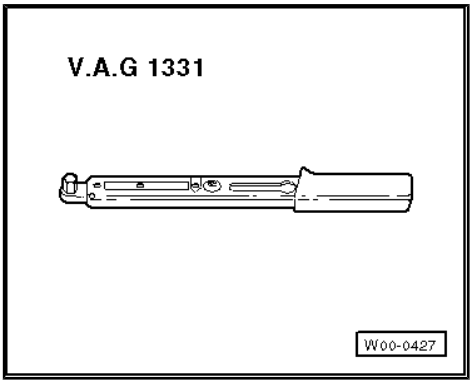
♦ *Check brake fluid level after changing brake pads.*

Specified torque:	
Hexagon bolt, brake caliper to brake carrier ♦ Use new bolts!	35 Nm

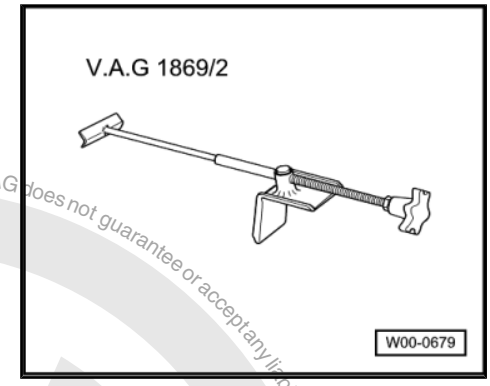
2.6 Removing and installing brake caliper

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



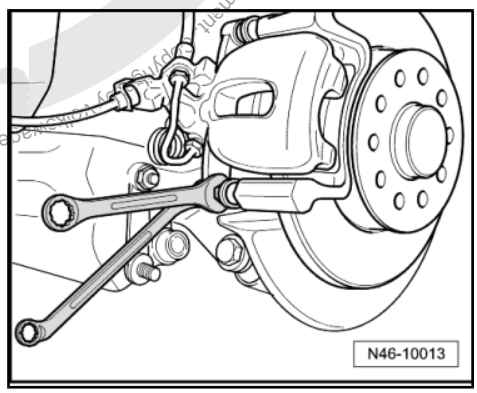
- Brake pedal depressor -V.A.G 1869/2-



2.6.1 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.



2.6.2 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 130 .
– 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:	
Hexagon bolt, brake caliper to brake carrier ♦ Use new bolts!	35 Nm
Brake line to brake caliper	14 Nm

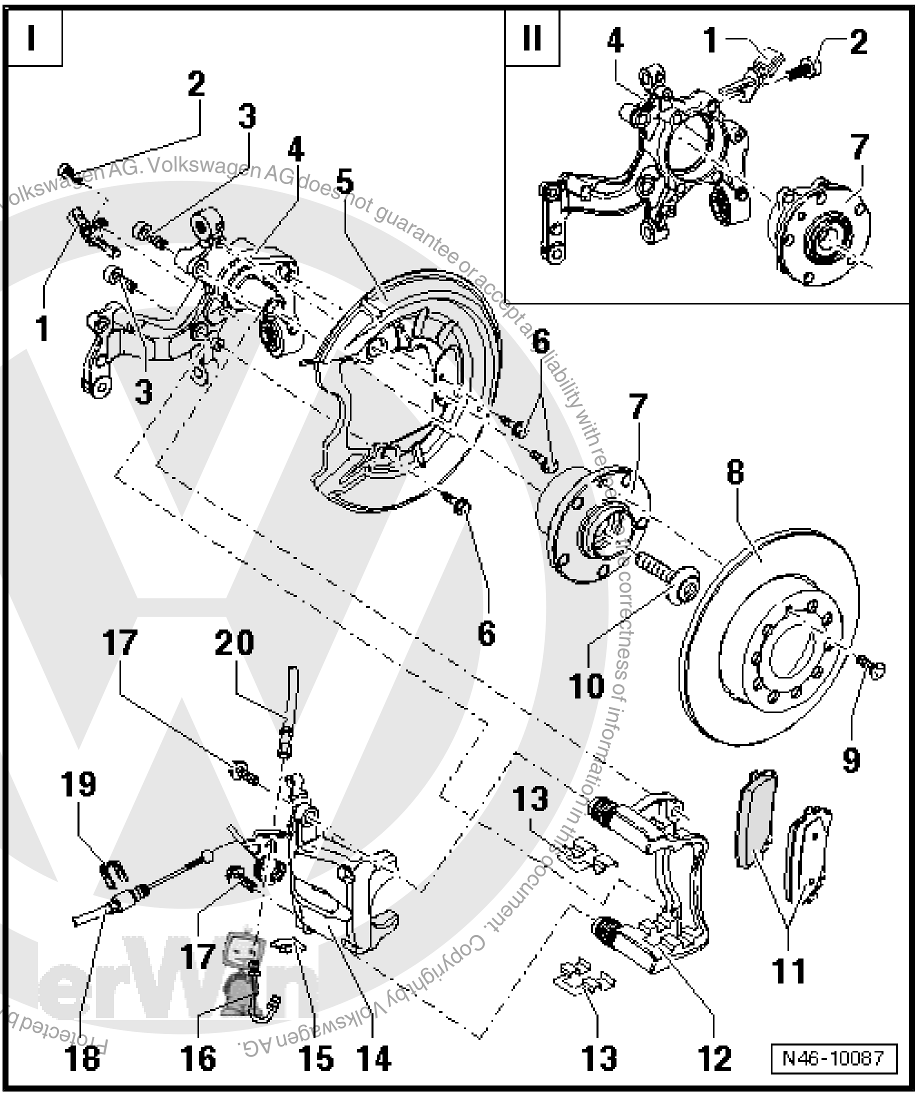
2.7 Repairing rear brake CII 41

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).*

I - Assembly overview, front-wheel drive

II - Deviations, four-wheel drive



1 - ABS speed sensor

- ❑ Before inserting sensor, clean hole inner surface and coat with high-temperature 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 / Torx bolt, 12 Nm

- ❑ M6x10 hexagon bolt revised to M6x12 Torx bolt
- ❑ Replace hexagon bolt with hexagon bolt and Torx bolt with Torx bolt

7 - Wheel bearing/hub unit

8 - Brake disc

- ❑ 15 inches: ∅ 260 mm; 16 inches: ∅ 286 mm; 17 inches: ∅ 310 mm
- ❑ Thickness, 15 and 16 inches: 12 mm; 17 inches: 22 mm
- ❑ Wear limit, 15 and 16 inches: 10 mm; 17 inches: 20 mm
- ❑ When worn, renew on both sides of axle.
- ❑ Unscrew brake caliper prior to removing.

9 - Cross-head screw, 4 Nm

10 - Bolt

- ❑ Front-wheel drive only

11 - Brake pads

- ❑ Thickness: 11 mm without backplate
- ❑ Pad wear limit: 2 mm without backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet 18.1 .
- ❑ Always renew on both sides of an axle.
- ❑ Removing and installing ⇒ page 97

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 97

13 - Pad retainer

- ❑ Always renew when changing pads.

14 - Brake caliper

- ❑ Do not disconnect brake hose when changing pads.
- ❑ Removing and installing ⇒ page 99
- ❑ Repairing ⇒ page 124
- ❑ Adjust handbrake cable first after repairing or replacement.
- ❑ Adjusting handbrake ⇒ page 101 .

15 - Hose retainer

16 - Brake line, 14 Nm

17 - Self-locking hexagon bolt, 35 Nm

- ❑ Renew.

18 - Handbrake cable

- ❑ Adjusting handbrake ⇒ page 101 .

19 - Spring clip

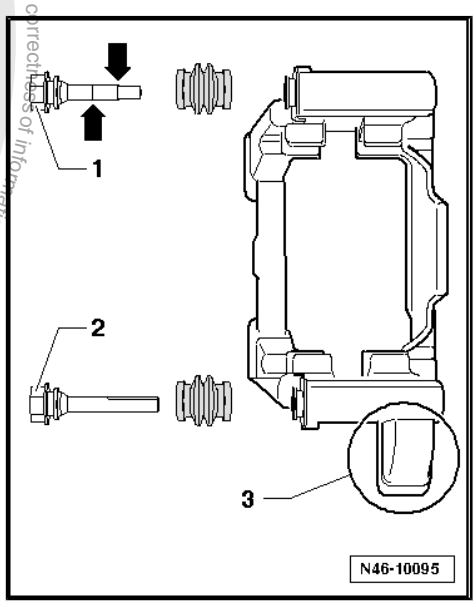
20 - Brake hose

Installation instructions for brake caliper CII 41, 15 inches, from week 32/2004:

1 - Shorter guide pins with steps -arrows-, leading side

2 - Longer guide pins, phasing out

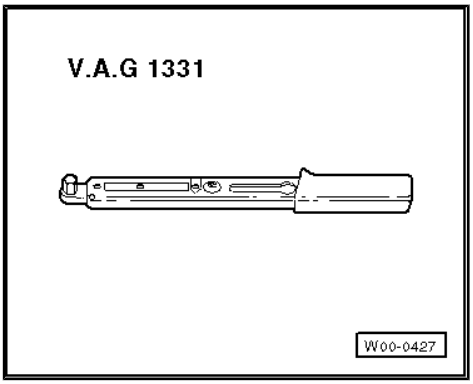
3 - Balance weight, phasing out



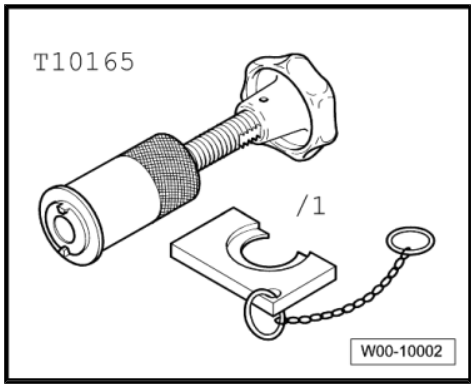
2.8 Removing and installing brake pads/linings

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



♦ Resetting and removal tool -T 10165-



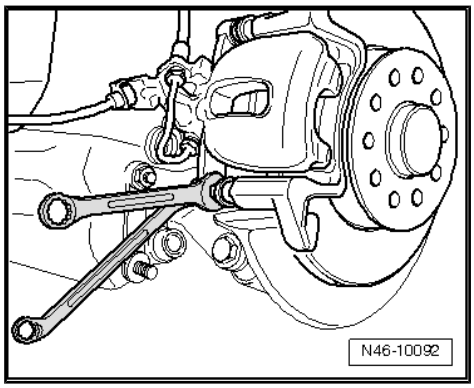
2.8.1 Removing

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

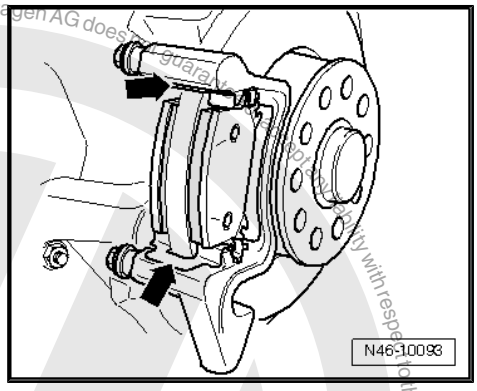
– Remove wheels.

– 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.

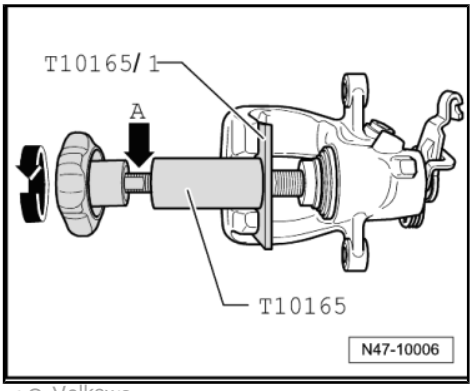
2.8.2 Installing

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.

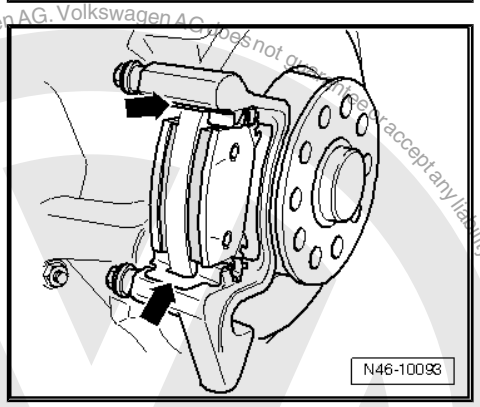
– Screw in piston by turning knurled wheel of resetting and removal tool - T 10165 - clockwise, do not damage protective cap when doing this.

– To aid screwing in, use special tool T10165/1.

♦ If pistons are difficult to move, use a 13 mm open jaw spanner on flats -arrow A- provided for this purpose.



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

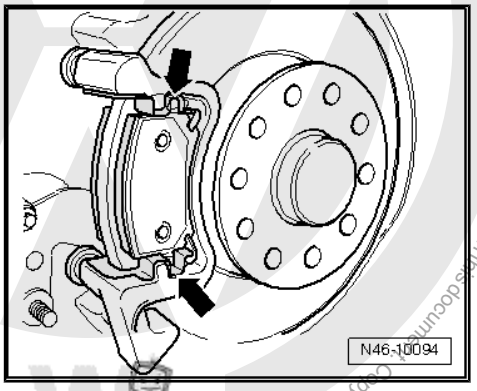


– Ensure that brake pads are seated correctly in pad retainers -arrows-.

– 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.*

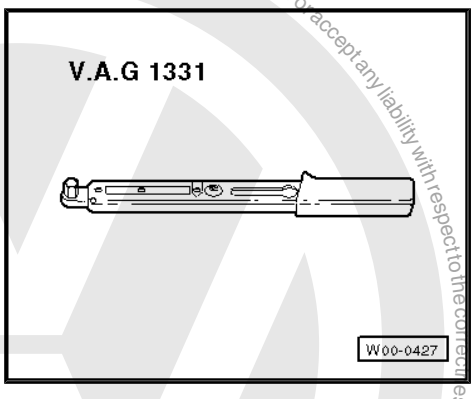
Specified torque:

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

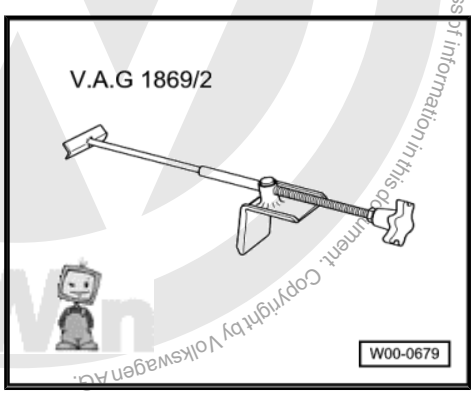
2.9 Removing and installing brake caliper

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331-



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



2.9.1 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.

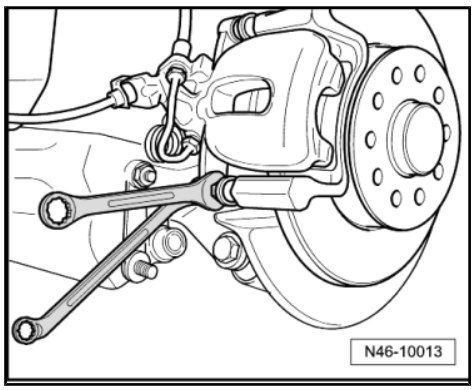
– Apply brake pedal depressor -V.A.G 1869/2- .

– 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.



2.9.2 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 130 .

– 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:	
Hexagon bolt, brake caliper to brake carrier ♦ Use new bolts!	35 Nm
Brake line to brake caliper	14 Nm

2.10 Adjusting handbrake

New adjustment is only necessary after renewing handbrake cables and brake calipers.

– 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 .

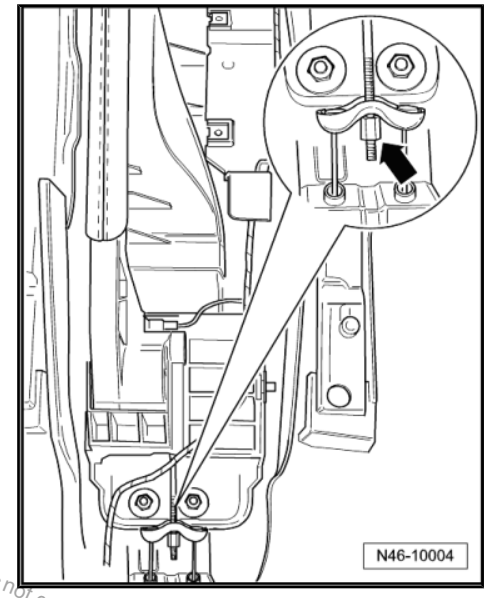
– Depress foot brake hard at least three times.

– Firmly pull on and then release handbrake three times.

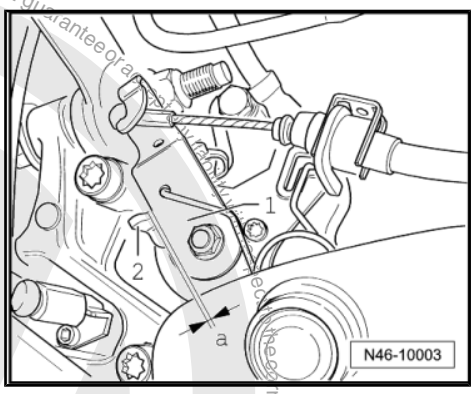
Below the first notch, the handbrake lever must return to its released position.

- Handbrake lever in rest position.

– Tighten adjusting nut -arrow (enlargement)- until ...



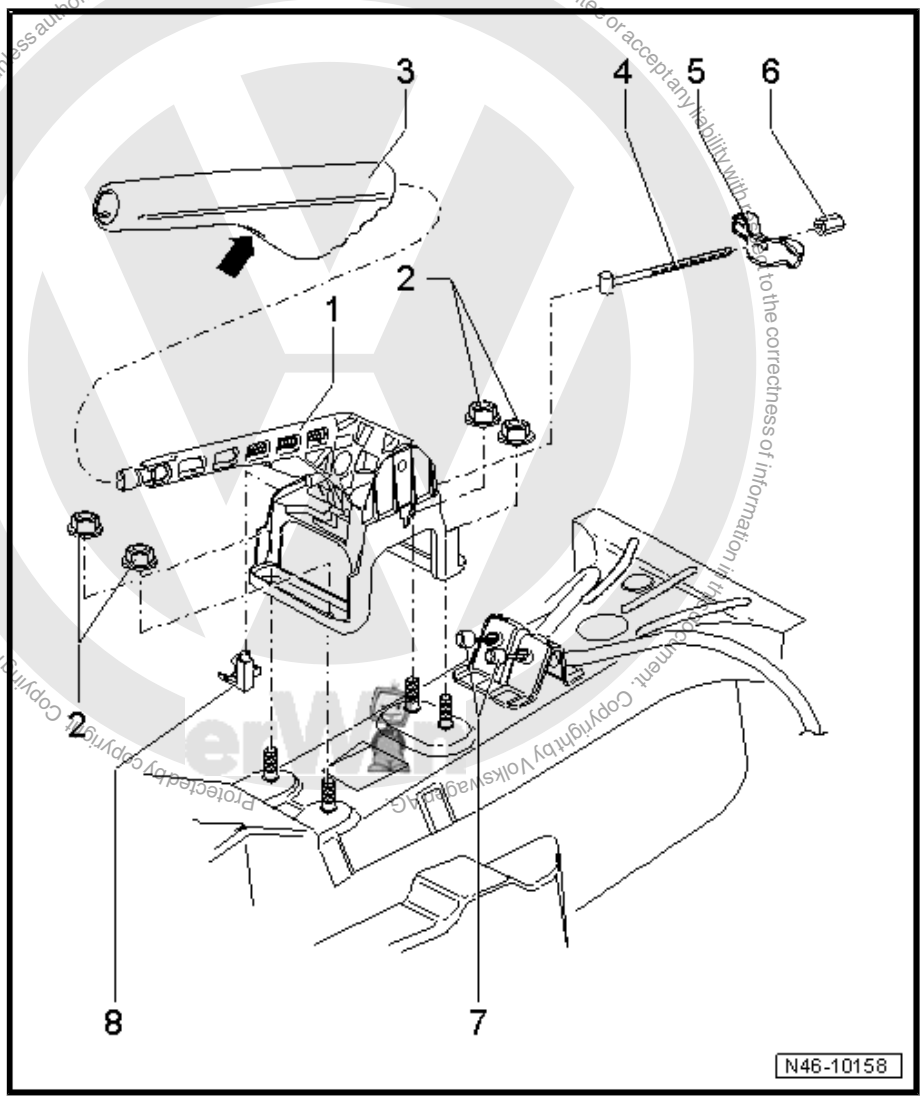
– ... lever -1- lifts off the brake caliper stop -2-.
– The total distance -a- to stops -2- on left and right brake calipers must not exceed 1.5 mm.
– Check that both wheels turn freely.



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

3 Assembly overview - handbrake lever

The illustration shows the assembly overview for the Touran.



1 - Handbrake lever

- ❑ Before removing take out centre console.

2 - Hexagon nut, 15 Nm

3 - Handbrake lever trim

- ❑ Pull off forwards.
- ❑ Lever up release tab in rear, lower area of handle -arrow- with a screwdriver.
- ❑ 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 cables

- ❑ Removing and installing up to model year 2007 ⇒ page 103
- ❑ Removing and installing from model year 2008 ⇒ page 106

8 - Handbrake warning switch

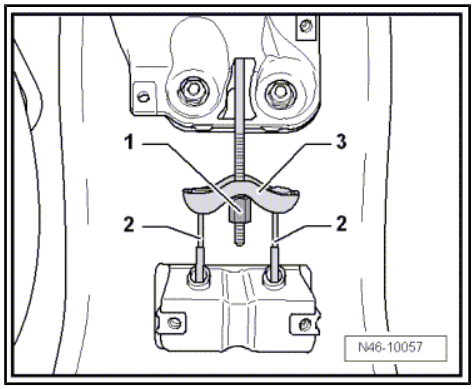
3.1 Removing and installing handbrake cable up to model year 2007

3.1.1 Removing

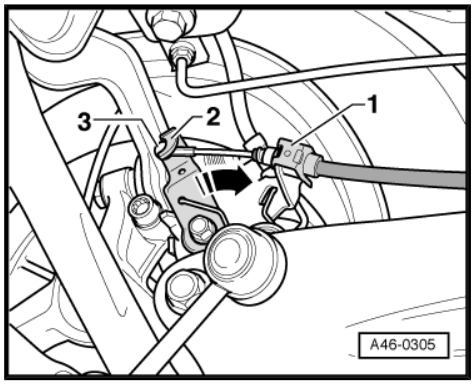
– Release handbrake

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

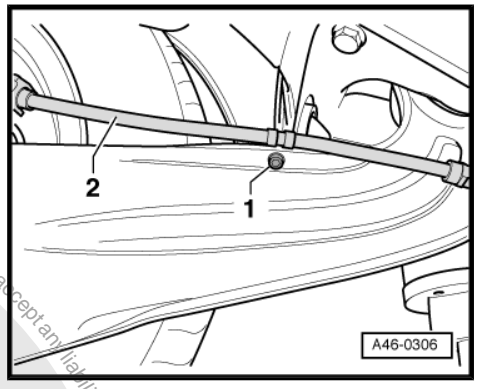
– Release adjustment nut -1- until relevant handbrake cable -2- can be detached from compensator -3-.



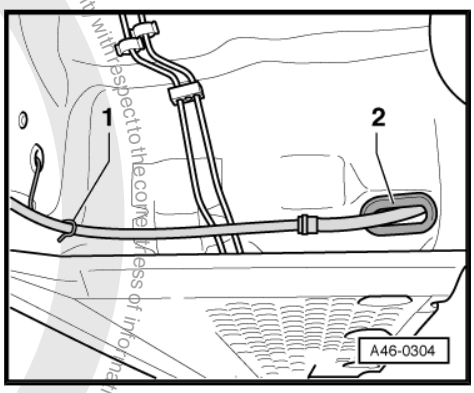
– Lever spring clips off -1-.
– Press lever on brake caliper -2- in direction of arrow and detach handbrake cable -3-.



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

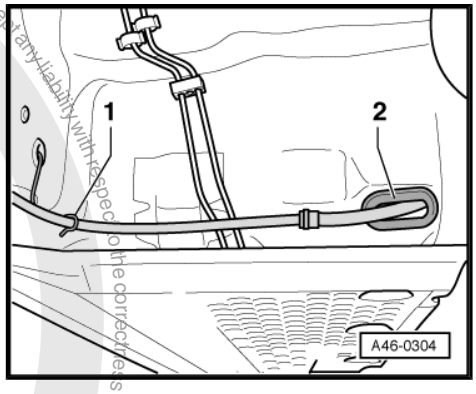


– Detach handbrake cable from bracket -1- and pull handbrake cable out of guide tube -2-.



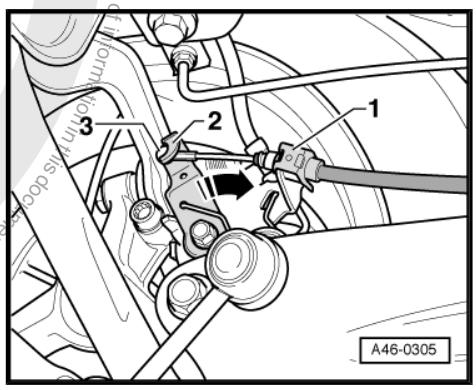
3.1.2 Installing

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



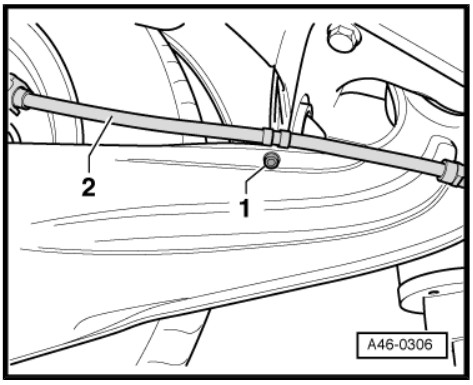
– Press lever on brake caliper -2- in direction of arrow and attach handbrake cable -3-.

– Press spring clips -1- onto handbrake cable.



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

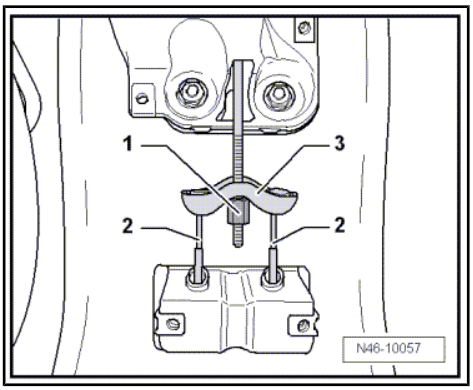
– Therefore, fastening clip -1- should only now be screwed onto trailing arm.



– Attach handbrake cable -2- into compensator -3-.

– Pretension handbrake cable with adjustment nut -1-.

– Adjust handbrake ⇒ page 101 .



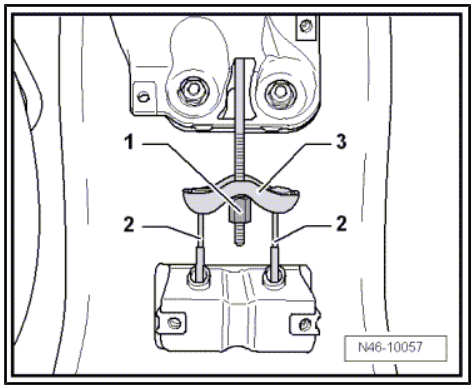
3.2 Removing and installing handbrake cable from model year 2008

3.2.1 Removing

– Release handbrake

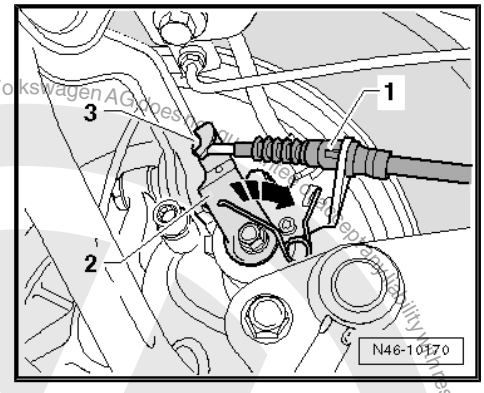
– Remove centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .

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

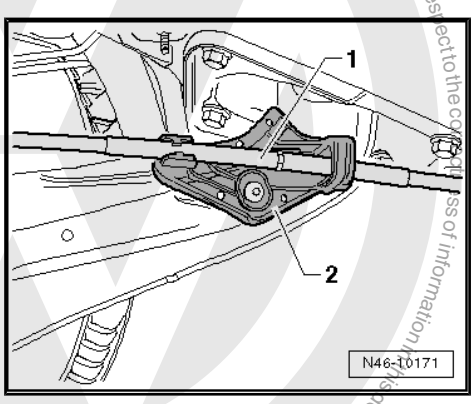


– Press lever on brake caliper -2- in direction of arrow and detach handbrake cable -3-.

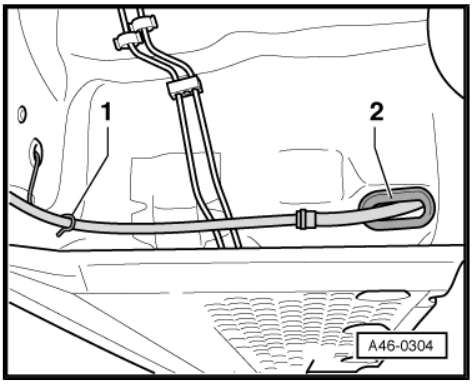
– Compress locking lugs -1- together and pull handbrake cable out of bracket on brake caliper.



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

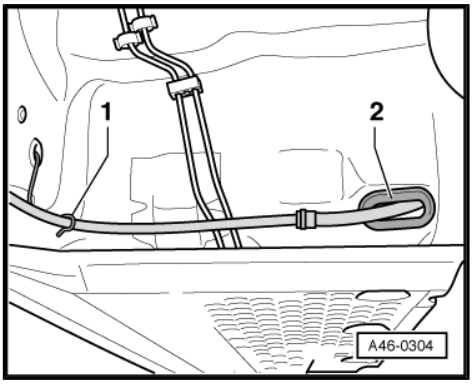


– Detach handbrake cable from bracket -1- and pull handbrake cable out of guide tube -2-.

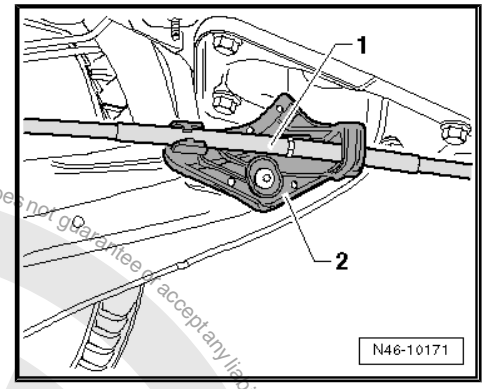


3.2.2 Installing

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



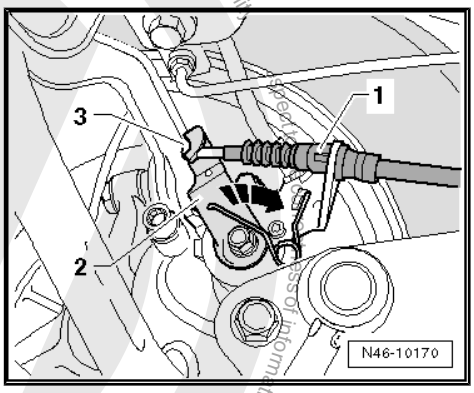
– Insert handbrake cable -1- through aperture, then clamp it to bracket -2-.



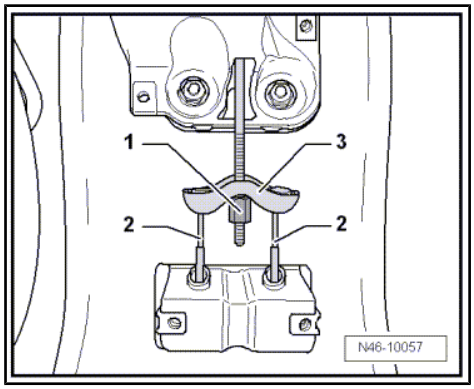
– Push handbrake cable into bracket on brake caliper until both locking lugs -1- engage.

– 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 .

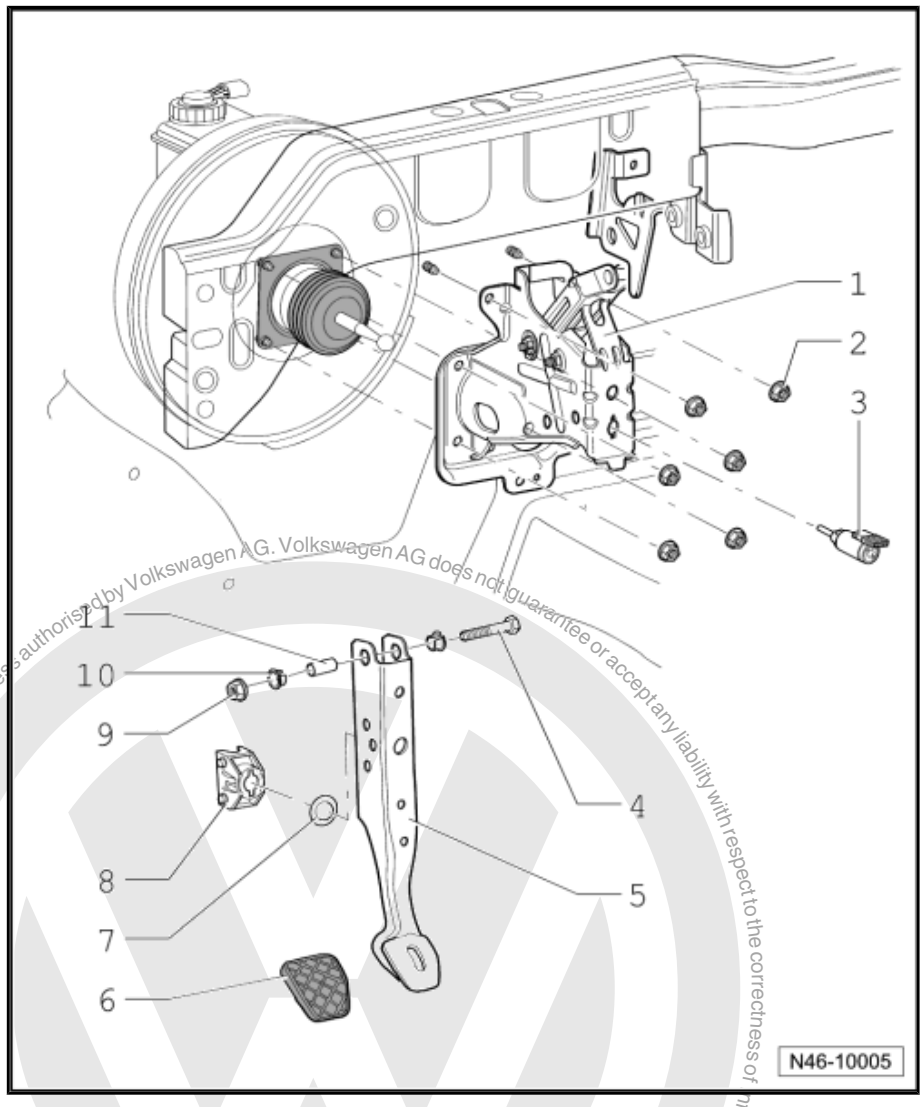


4 Assembly overview - brake pedal

WARNING

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

Grease all mountings before installing with grease Part No. G 000 602.



1 - Mounting bracket

2 - Self-locking hexagon nut, 25 Nm

3 - Brake light switch -F-

- Including brake pedal switch -F47- .
- In vehicles from week 45/2005, the brake light switch -F- is located on the brake master cylinder ⇒ page 133 .
- Before installing brake light switch, connect brake pedal to brake servo push rod ⇒ page 110 .
- Grease head of push rod with polycarbamide grease G 052 142 A2.
- Removing and installing brake light switch ⇒ page 110

4 - Hexagon bolt

5 - Brake pedal

6 - Cap

7 - Ball socket

8 - Mounting

- For ball head of brake servo plunger rod.

9 - Self-locking hexagon nut, 25 Nm

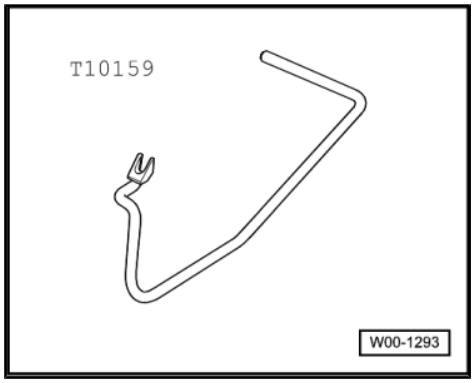
10 - Sleeve bearing

11 - Pivot pin

4.1 Separating brake pedal from brake servo

Special tools and workshop equipment required

♦ Release tool -T 10159-



– 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.

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

Continuation for all vehicles:

– First press brake pedal in direction of brake servo and hold.

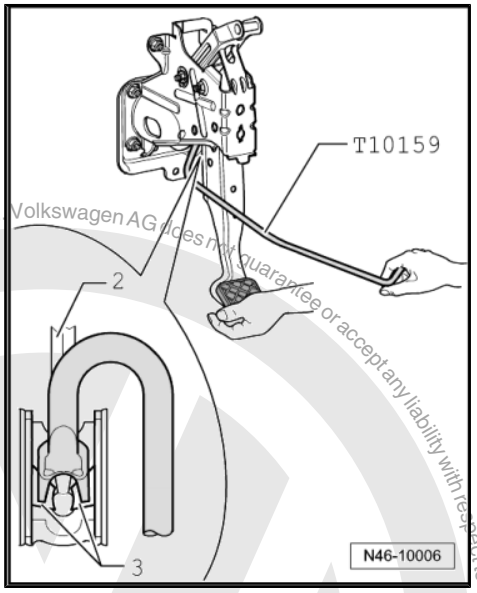
2 - Push rod

3 - Retaining lugs

– Insert release tool -T 10159- 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 -T 10159- and brake pedal together towards driver seat. (This action will pull the brake pedal off the ball head of the plunger rod).



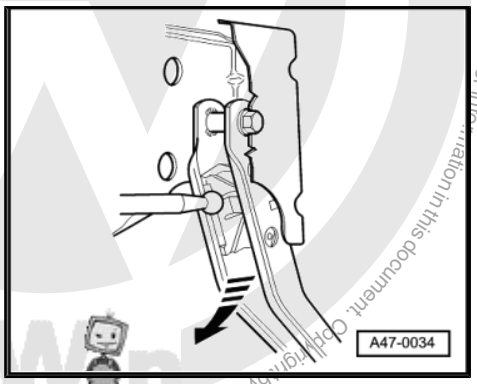
4.1.1 Clipping brake pedal to brake servo

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

Continue installation in reverse order.

Vehicles with brake light switch on mounting bracket only:

– Install brake light switch ⇒ page 110.

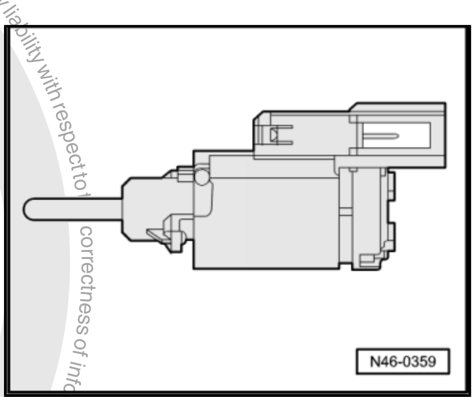


4.2 Removing and installing brake light switch - F- from week 45 of 2005

Including brake pedal switch -F47-

In vehicles from week 45/2005, the brake light switch is located on the brake master cylinder ⇒ page 133 .

4.2.1 Brake light switch, old version



Note

- *After removing the old brake light switch (see figure N46-0359), replace it with a new one (see figure N46-10145).*
- *Distinguishing features ⇒ page 112 .*

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.

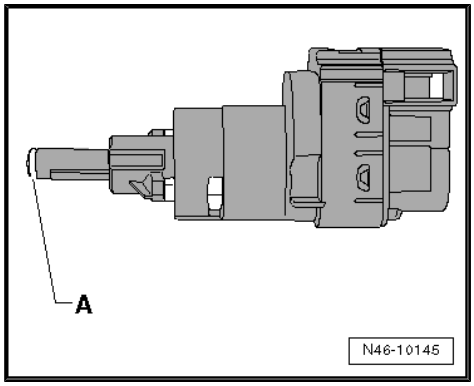
– Remove brake light switch by turning 45° to left.

Installing, adjusting and locking

Because old brake light switches may no longer be used, the description has been omitted.

Installing, adjusting and locking new brake light switch ⇒ page 112 .

4.2.2 Brake light switch, new version



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.

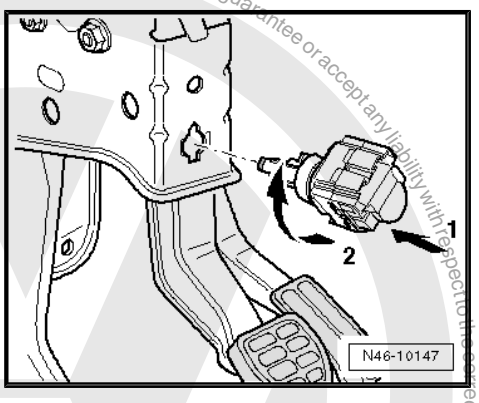
The brake light switch may be removed only while operating rod is pressed in (brake pedal is not operated), or the locking mechanism of the brake light switch will be damaged.

– 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

47 – Brakes - hydraulics

1 Repairing front brake caliper

1.1 Repairing brake caliper FS III

- 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 sealing ring.

1 - Dust cap
- ❑ Fit onto bleeder valve.

2 - Bleeder valve, 10 Nm
- ❑ Apply thin coat of assembly paste G 052 150 A2 to thread before screwing in.

3 - Cover caps
- ❑ Insert into sleeve bearing.

4 - Guide pin, 30 Nm

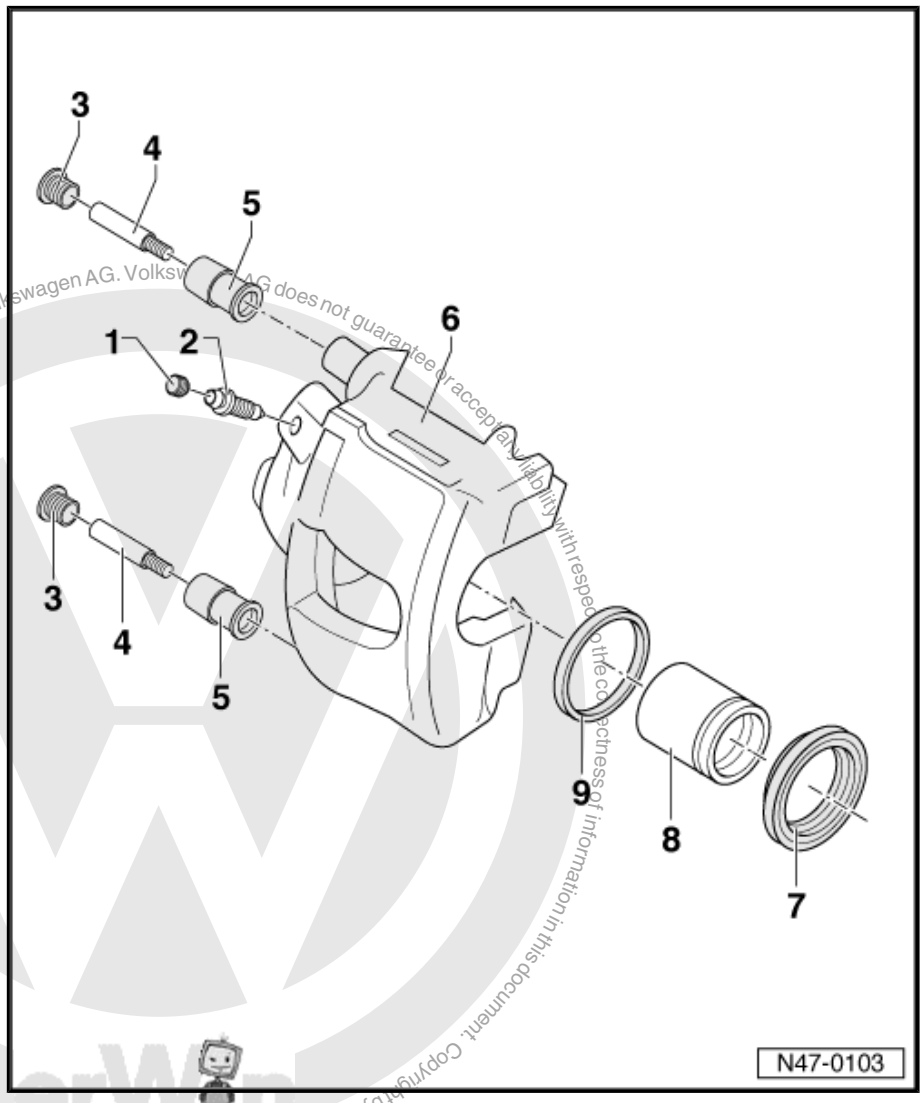
5 - Sleeve bearing
- ❑ Insert into brake caliper.

6 - Brake caliper

7 - Protective cap
- ❑ Removing and installing ⇒ page 113
- ❑ Take care not to damage when inserting piston.

8 - Piston
- ❑ Removing and installing ⇒ page 113
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before installing.

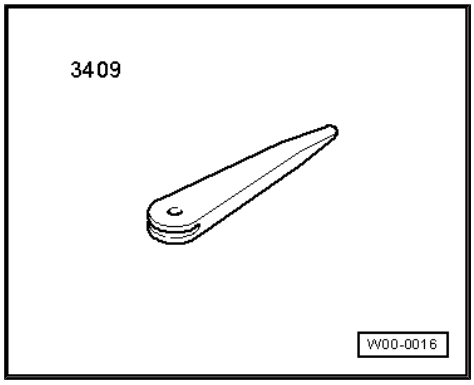
9 - Sealing ring
- ❑ Removing and installing ⇒ page 113



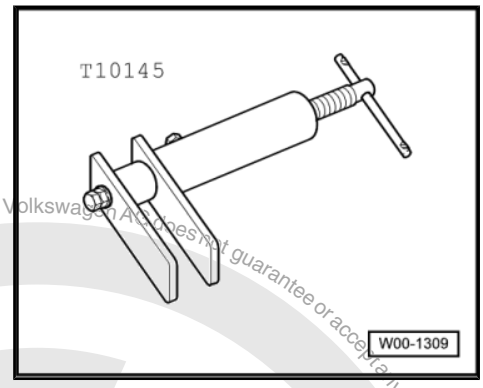
1.2 Removing and installing piston for brake caliper FS III

Special tools and workshop equipment required

- Removal wedge -3409-



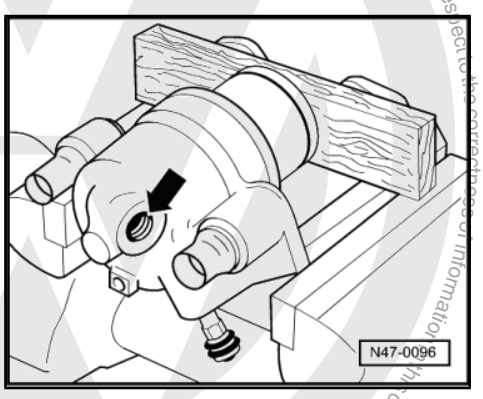
- Piston resetting tool -T 10145-



1.2.1 Removing

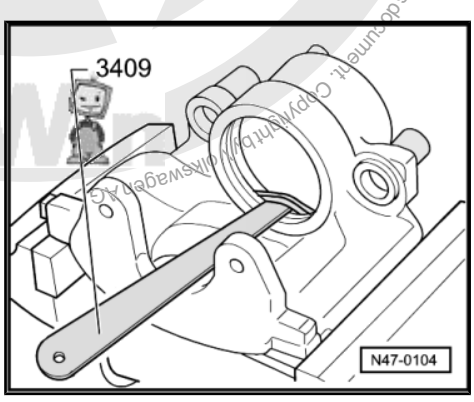
– Press piston out of brake caliper using compressed air.

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



– Remove seal using wedge 3409.

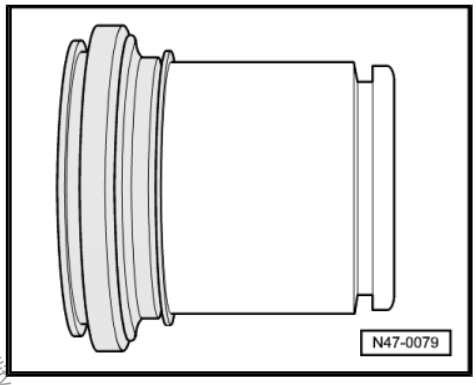
When removing ensure that the surface of the cylinder is not damaged.



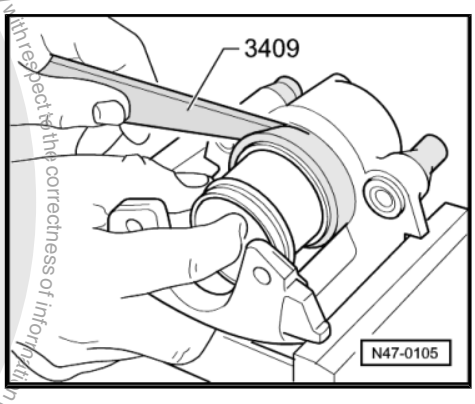
1.2.2 Installing

– The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.

– Apply a thin coat of assembly paste G 052 150 A2 to piston and seal before inserting.
– Insert seal into brake caliper.
– Place outer sealing lip of protective cap on the piston.
– Insert inner sealing lip into groove in cylinder using wedge 3409.

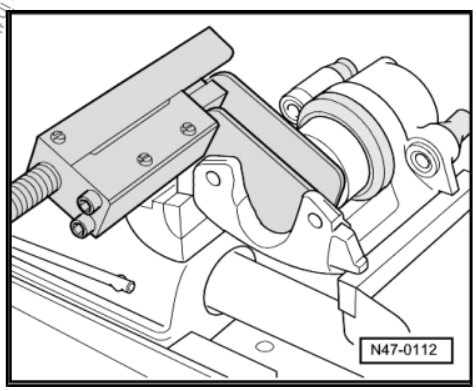


When doing this, hold piston in front of brake caliper.



– Press piston into brake caliper with piston resetting tool.

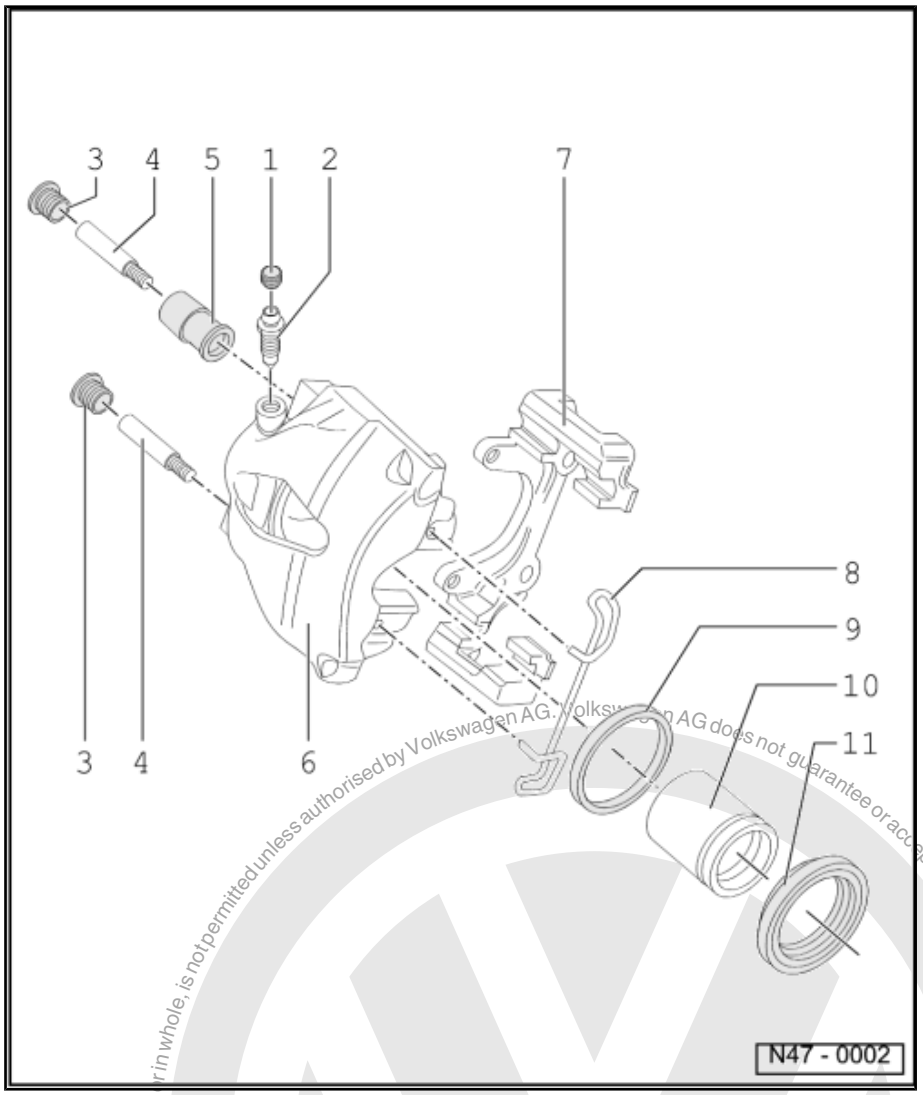
The outer sealing lip on the protective cap will then spring into the piston groove.



1.3 Repairing brake caliper FN 3

- 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 sealing ring.



1 - Dust cap
- ❑ Fit onto bleeder valve.

2 - Bleeder valve, 10 Nm
- ❑ Apply thin coat of assembly paste G 052 150 A2 to thread before screwing in.

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 116

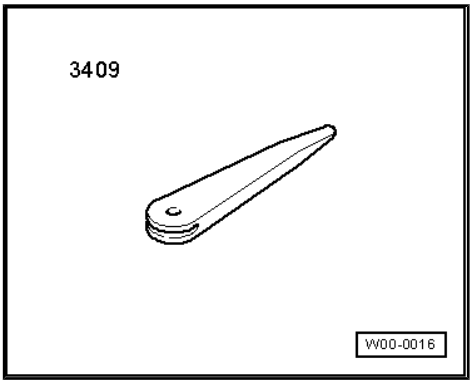
10 - Piston
- ❑ Removing and installing ⇒ page 116
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before installing.

11 - Protective cap
- ❑ Removing and installing ⇒ page 116
- ❑ Take care not to damage when inserting piston.

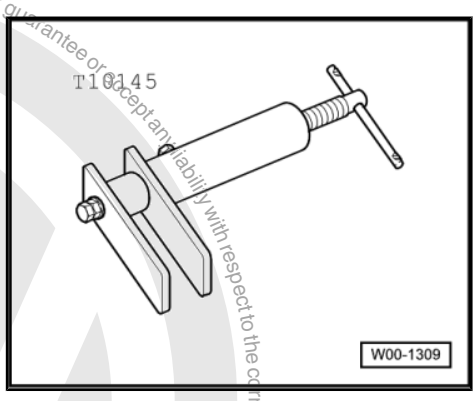
1.4 Removing and installing piston for brake caliper FN 3

Special tools and workshop equipment required

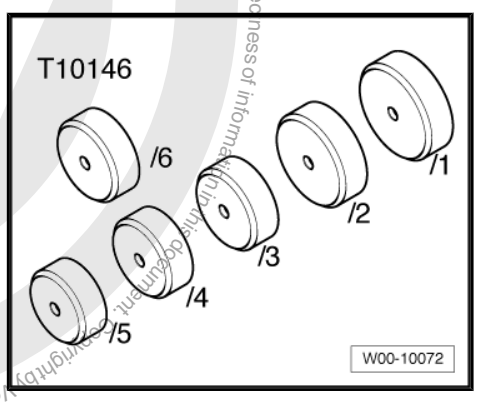
- Removal wedge -3409-



- Piston resetting tool -T 10145-



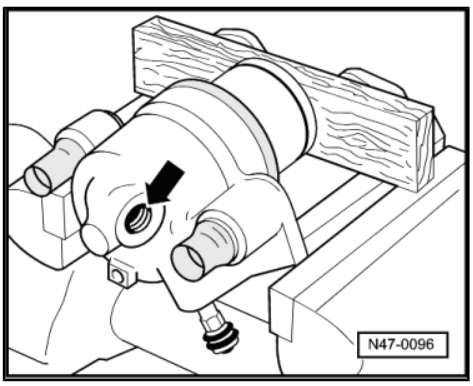
- Assembly tool for protective caps -T 10146/6-



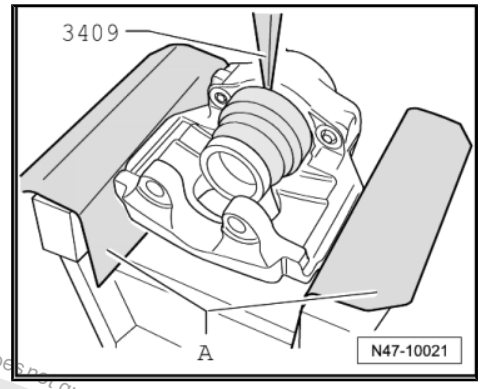
1.4.1 Removing

– Press piston out of brake caliper using compressed air.

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

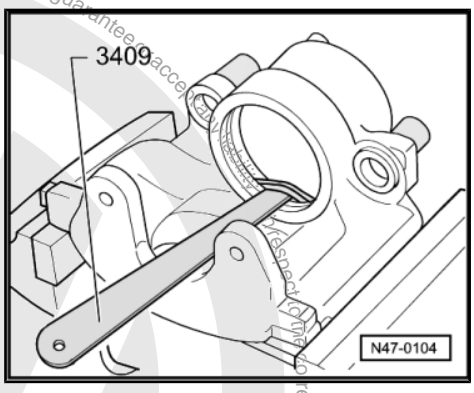


– Lever off protective cap from brake caliper using wedge 3409.



– Remove seal using wedge 3409.

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



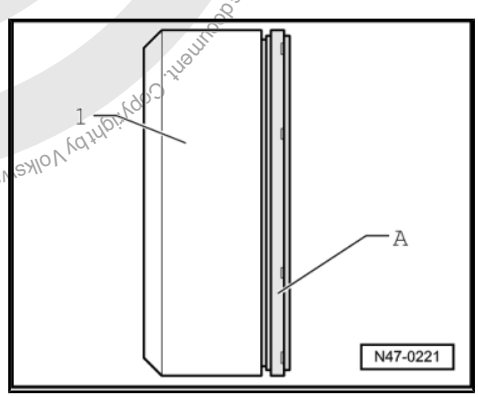
1.4.2 Installing

– The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.

– Apply a thin coat of assembly paste G 052 150 A2 to piston and seal before inserting.

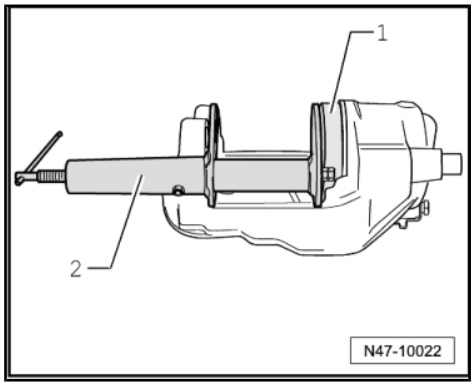
– Insert seal into brake caliper.

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

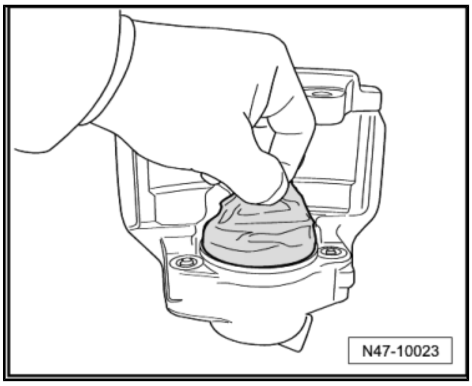


– Press protective cap onto brake caliper so that seal is fitted correctly all round using assembly tool -1- and piston resetting tool -2-.

Check seat of protective cap:



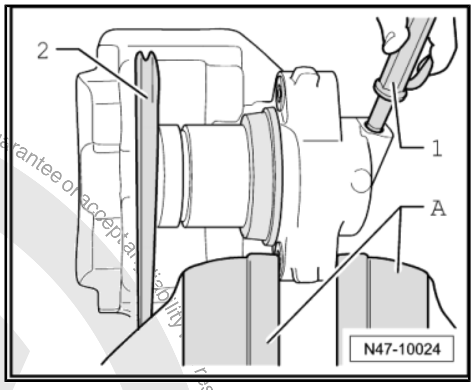
– At this stage it should not be possible to remove protective cap from brake caliper by hand.



– Press piston lightly onto protective seal and lock it in this position with, for example, an assembly wedge -2-.

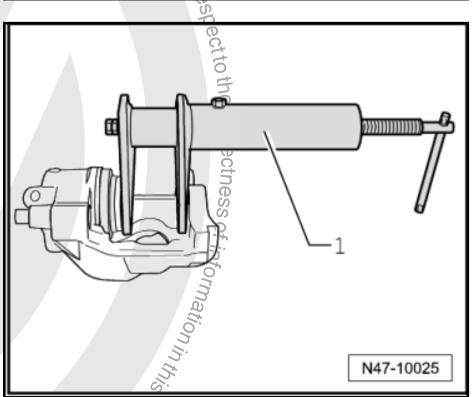
Keep piston straight to prevent damage to sealing collar.

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



– Press piston into brake caliper using piston resetting tool -1-.

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

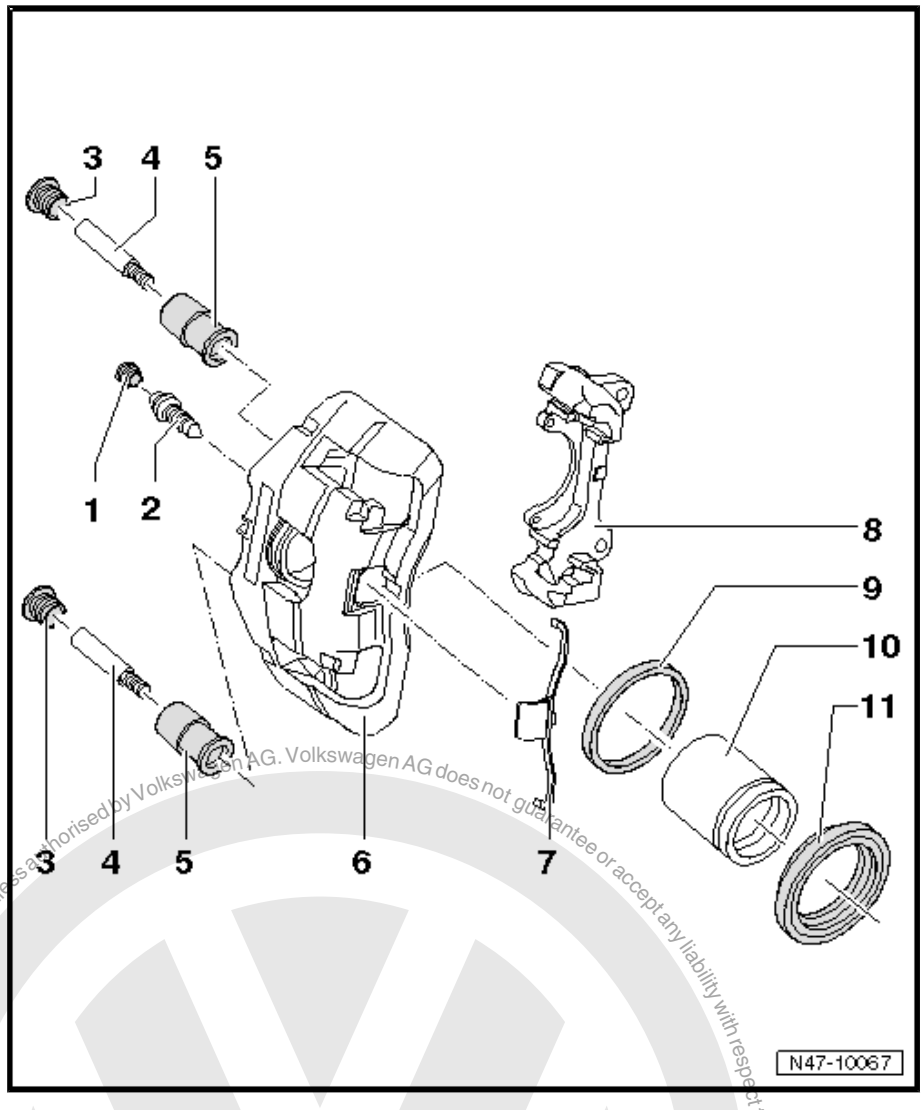


1.5 Repairing FNR-G brake caliper

♦ 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 sealing ring.



1 - Dust cap
- ❑ Fit onto bleeder valve.

2 - Bleeder valve, 12 Nm
- ❑ Apply thin coat of assembly paste G 052 150 A2 to thread before screwing in.

3 - Cover caps
- ❑ Insert into sleeve bearing.

4 - Guide pin, 30 Nm

5 - Sleeve bearing
- ❑ Insert into brake caliper.

6 - Brake caliper
- ❑ Must not be unbolted from one another.

7 - Retaining spring
- ❑ Insert into brake pad retaining spring and press under brake carrier.

8 - Brake carrier
- ❑ Bolt onto brake caliper.

9 - Sealing ring
- ❑ Removing and installing ⇒ page 120

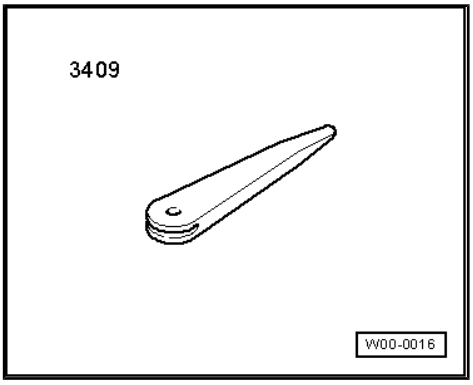
10 - Piston
- ❑ Removing and installing ⇒ page 120
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before installing.

11 - Protective cap
- ❑ Removing and installing ⇒ page 120
- ❑ Take care not to damage when inserting piston.

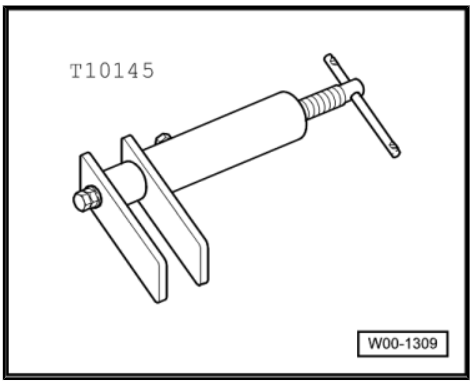
1.6 Removing and installing piston for FNR-G brake caliper

Special tools and workshop equipment required

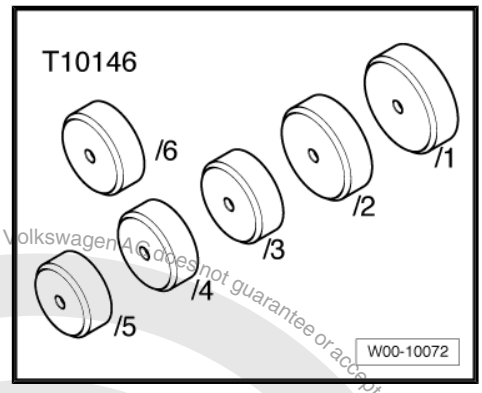
- Removal wedge -3409-



- Piston resetting tool -T 10145-



- Assembly tool for protective caps -T 10146/6-

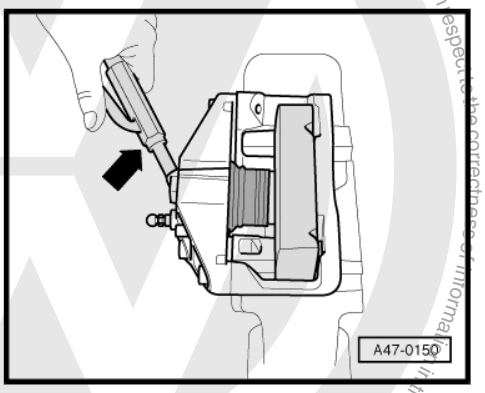


1.6.1 Removing

– Press piston out of brake caliper using compressed air.

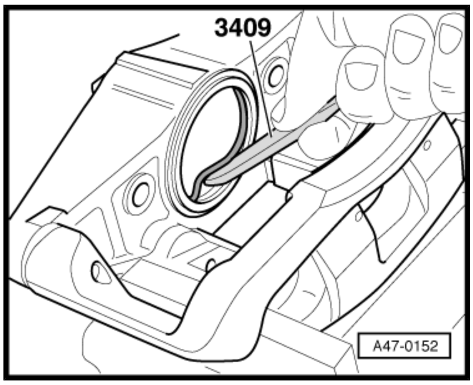
Place a piece of wood in the recess to prevent damage to the piston.

– Lever off protective cap from brake caliper using wedge 3409.



– Remove seal using wedge 3409.

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

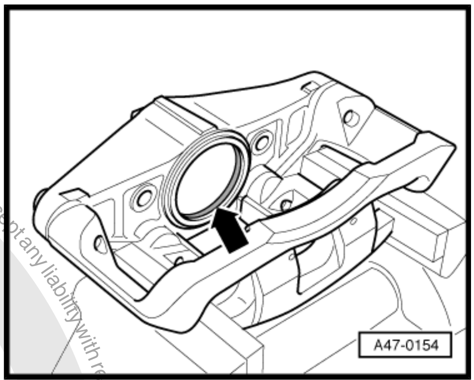


1.6.2 Installing

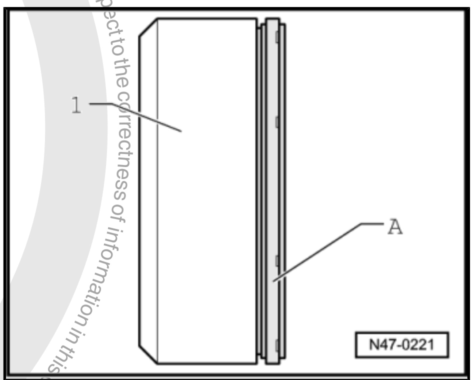
– The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.

– Apply a thin coat of assembly paste G 052 150 A2 to piston and seal before inserting.

– Insert seal into brake caliper.



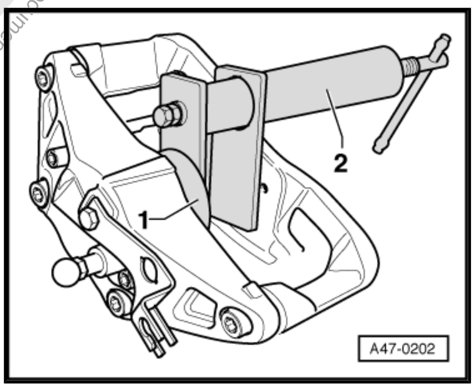
– Fit protective cap -A- in assembly tool T10146/1 -1-.



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

Check seat of protective cap:

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



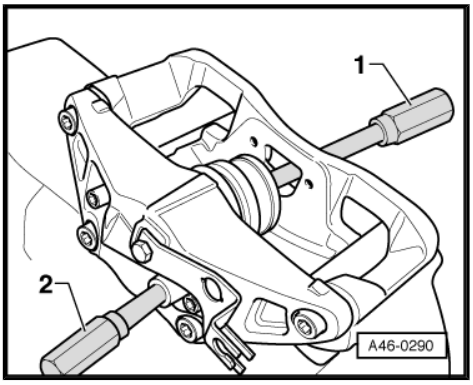
– Gently press piston onto protective seal using an extension and ratchet insert -1- and then hold in this position.

Keep piston straight to prevent damage to sealing collar.

– Blow into protective cap using compressed air (max 3 bar) -2-. During this step protective cap will spring on piston.

– Press piston into brake caliper by hand, subsequently pressing with piston resetting tool if necessary.

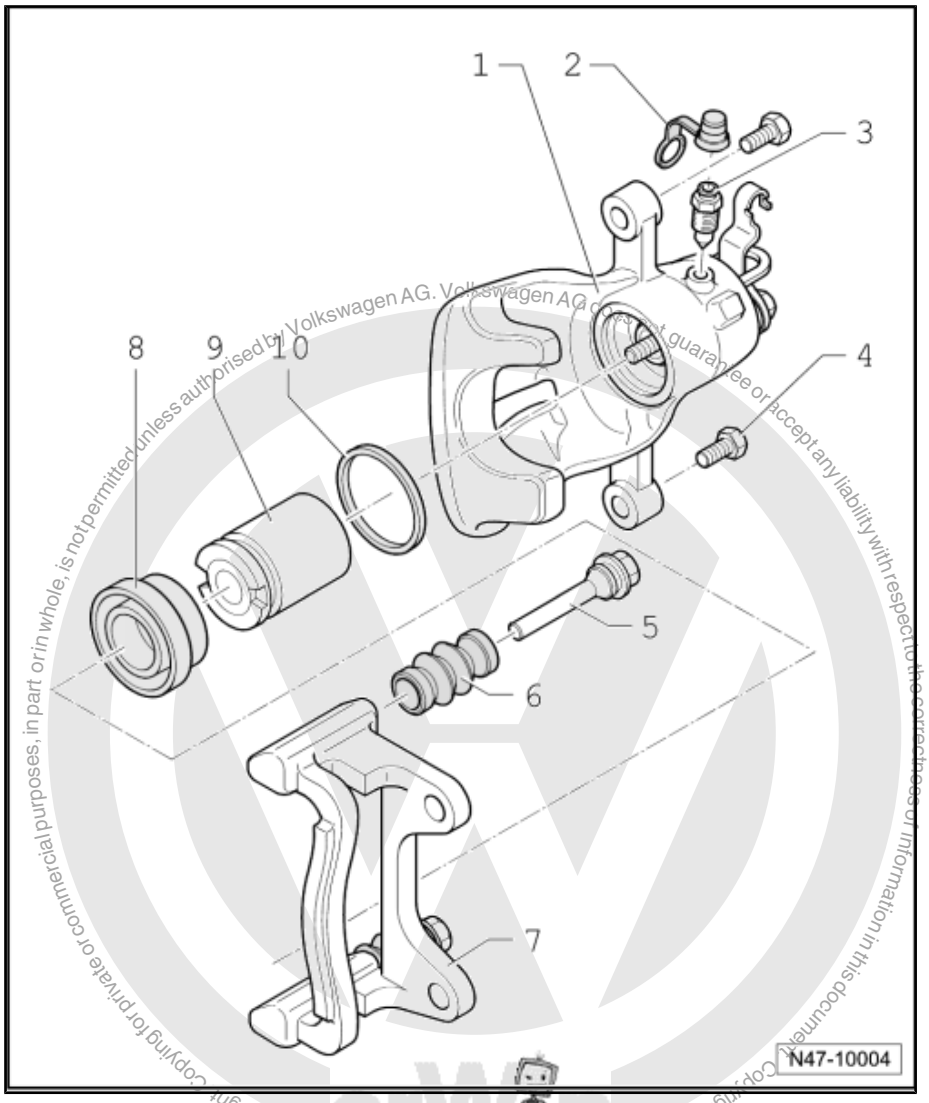
The outer sealing lip on the protective cap will then spring into the piston groove.



2 Repairing rear 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 sealing ring.
- When repairs are performed, it is essential to appropriately pre-bleed brake calipers (without brake pads) before installing in vehicle ⇒ page 128 .

Assembly overview of brake calipers CI 38 and CII 38:



1 - Brake caliper with hand-brake cable lever

- ❑ If there is a leak at hand-brake cable lever, renew brake caliper.
- ❑ Following repair work, pre-bleed brake caliper ⇒ page 128 .

2 - Dust cap

3 - Bleeder valve, 10 Nm

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

4 - Self-locking hexagon bolt, 35 Nm

- ❑ 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

- ❑ Illustration for CII 38 brake
- ❑ 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.

8 - Protective cap

- ❑ Pull on so that outer sealing lip goes over piston.
- ❑ Removing and installing ⇒ page 126

9 - Piston with automatic adjustment

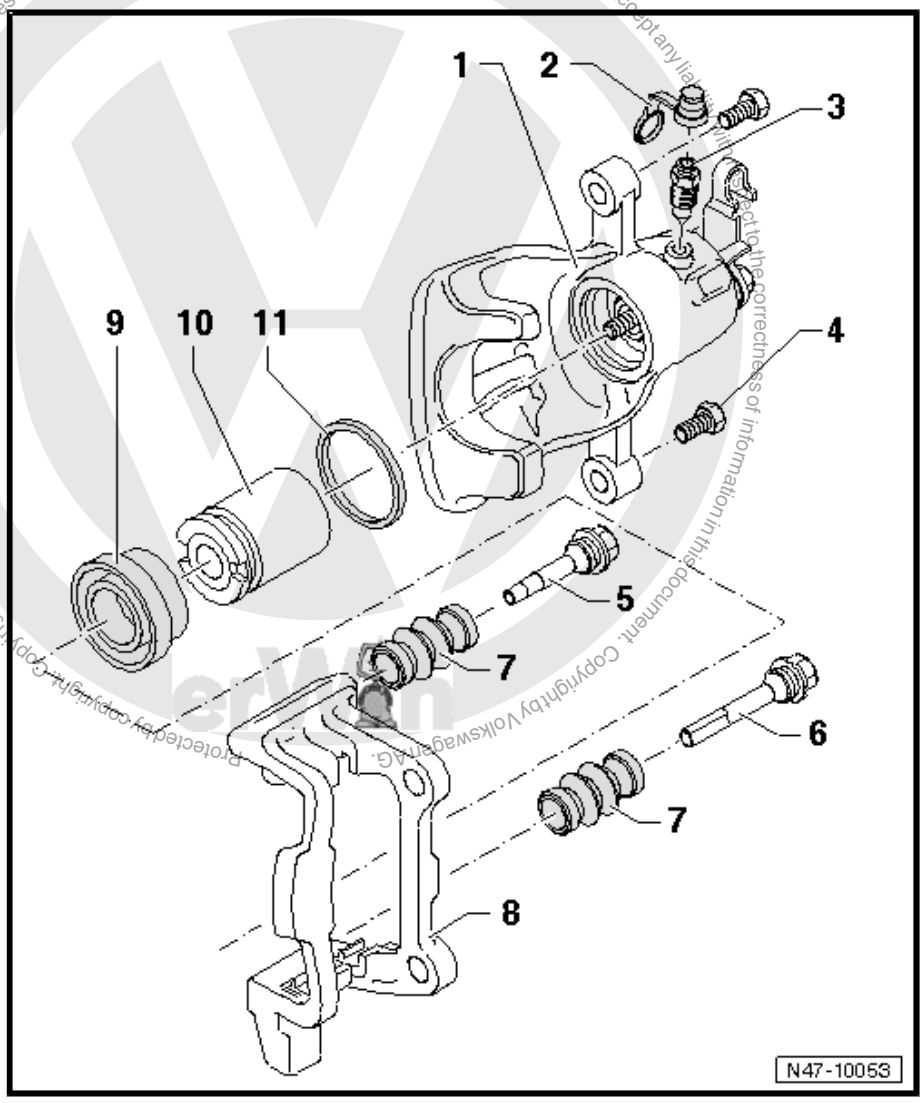
- ❑ Removing and installing ⇒ page 126
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before installing.

10 - Sealing ring

- ❑ Removing and installing ⇒ page 126

Assembly overview of brake caliper CII 41:

15 inches from week 32/2004:



1 - Brake caliper with hand-brake cable lever

- ❑ If there is a leak at hand-brake cable lever, renew brake caliper.
- ❑ Following repair work, pre-bleed brake caliper ⇒ page 128 .

2 - Dust cap

3 - Bleeder valve, 10 Nm

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

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
- ❑ Grease before fitting protective cap.

6 - Guide pin

- ❑ Longer than item 5
- ❑ Grease before fitting protective cap.

7 - Protective cap

- ❑ Fit onto brake carrier and guide pin.

8 - Brake carrier with balance weight

- ❑ 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.

9 - Protective cap

- ❑ Pull on so that outer sealing lip goes over piston.
- ❑ Removing and installing ⇒ page 126

10 - Piston with automatic adjustment

- ❑ Removing and installing ⇒ page 126
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before installing.

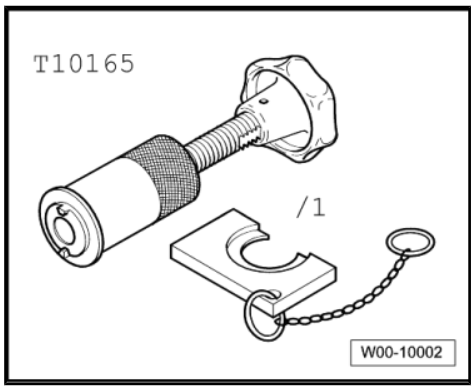
11 - Sealing ring

❑ Removing and installing ⇒ page 126

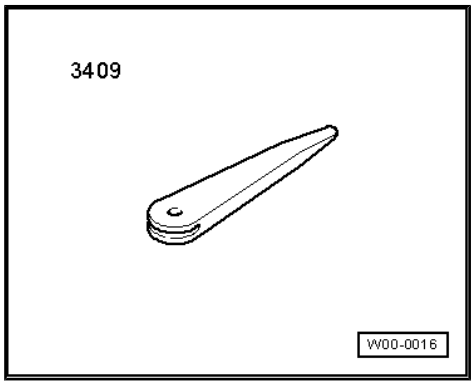
2.1 Removing

Special tools and workshop equipment required

♦ Resetting and removal tool -T 10165-



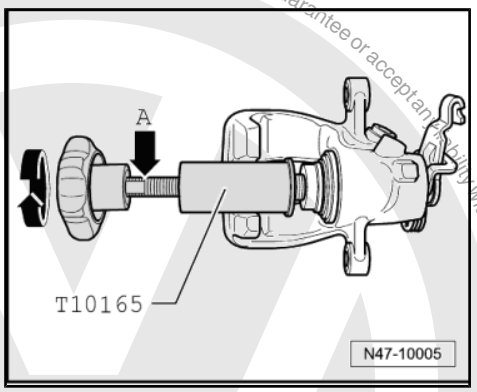
♦ Removal wedge -3409-



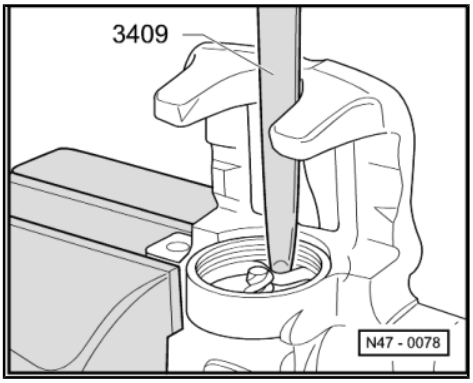
– Screw piston out of brake caliper by turning thumb wheel anti-clockwise.

Apply resetting and removal tool so that collar of tool is resting on piston.

♦ If pistons are difficult to move, use a 13 mm open jaw spanner on flats -arrow A- provided for this purpose.



– Remove seal using wedge 3409.



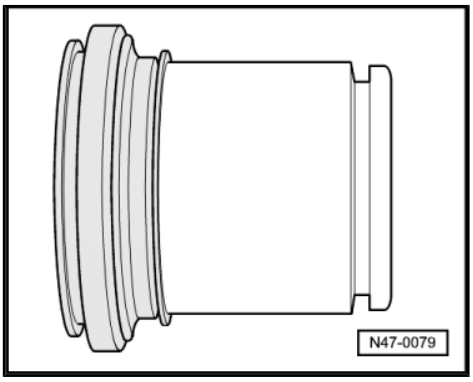
2.2 Installing

– The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.

– Apply a thin coat of assembly paste G 052 150 A2 to piston and seal before inserting.

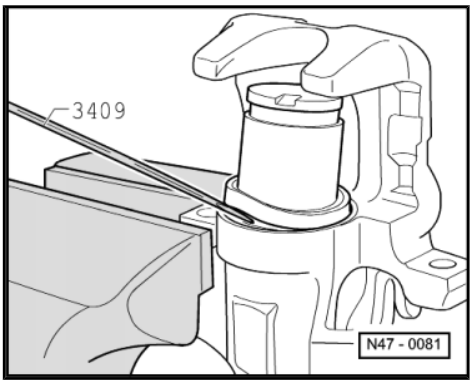
– Place protective cap with outer sealing lip onto piston.

– Insert inner sealing lip into groove in cylinder using wedge 3409.



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

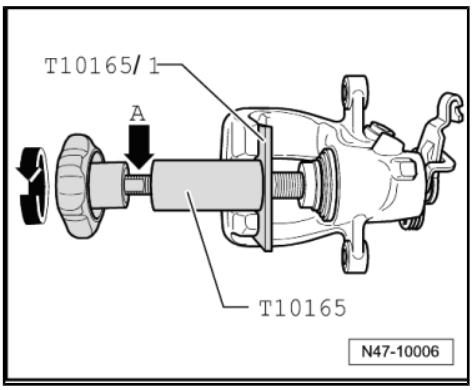
– Screw in piston by turning thumb wheel clockwise.



– To aid screwing in, use special tool T10165/1.

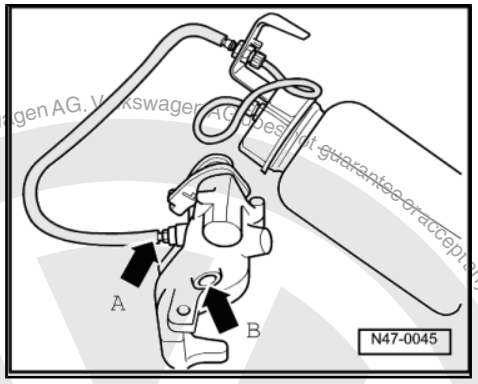
♦ Apply resetting and removal tool so that collar of tool is resting on brake caliper.

♦ If the piston is pushed back with a piston resetting tool (e.g. T10145) or by operating the foot brake the automatic adjustment in the brake caliper is destroyed.



2.3 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.

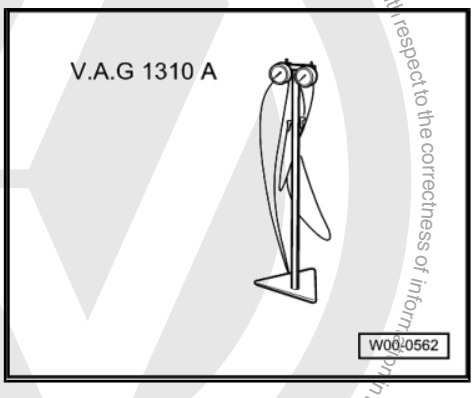


Position brake caliper as illustrated to pre-bleed.

3 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-



3.1 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 pressure gauge -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.

4 Bleeding brake system

Bleeding the brake system is described for brake filling and bleeding equipment -VAS 5234- and -V.A.G 1869- .

Note

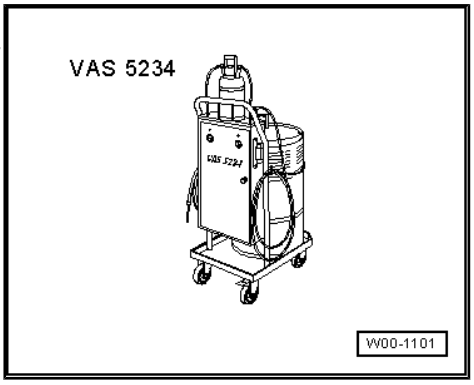
- *Bleeding brake system on vehicles with ABS is performed in the same way as on vehicles with a conventional brake system.*
- *Only use new brake fluid conforming to US standard FMVSS 116 DOT 4.*
- *Genuine VW/Audi brake fluid conforms to this specification.*
- *Brake fluid is poisonous. Also due to 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.*

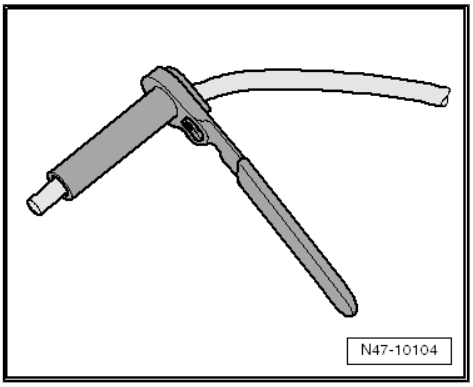
A pre-pressure of 2 bar is required for bleeding the hydraulic unit.

4.1 Bleeding brake system using brake filling and bleeding equipment -VAS 5234- or -V.A.G 1869-

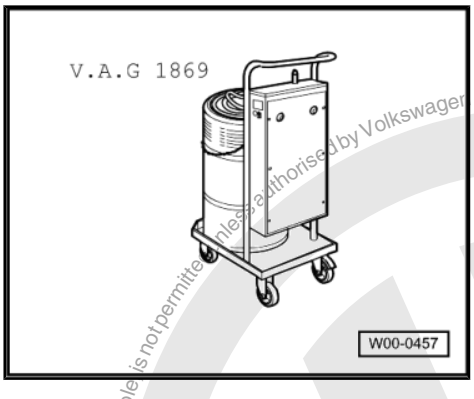
Special tools and workshop equipment required

- 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 EDL, EDL/TCS or EDL/TCS/ESP, a chamber in brake fluid reservoir is completely empty (e.g. brake system leaking), brake system must be pre-bled first.

4.1.1 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.

Then hydraulic unit must be bled again via function “Basic setting” of tester -VAS 5051- .

Initiate basic setting (to bleed brake system):

Connecting -VAS 5051- and selecting functions ⇒ page 13 .

– Then bleed brake system as normal.

4.1.2 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.

4.1.3 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 bleeder valve 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!

4.2 Changing brake fluid

4.2.1 Changing brake fluid

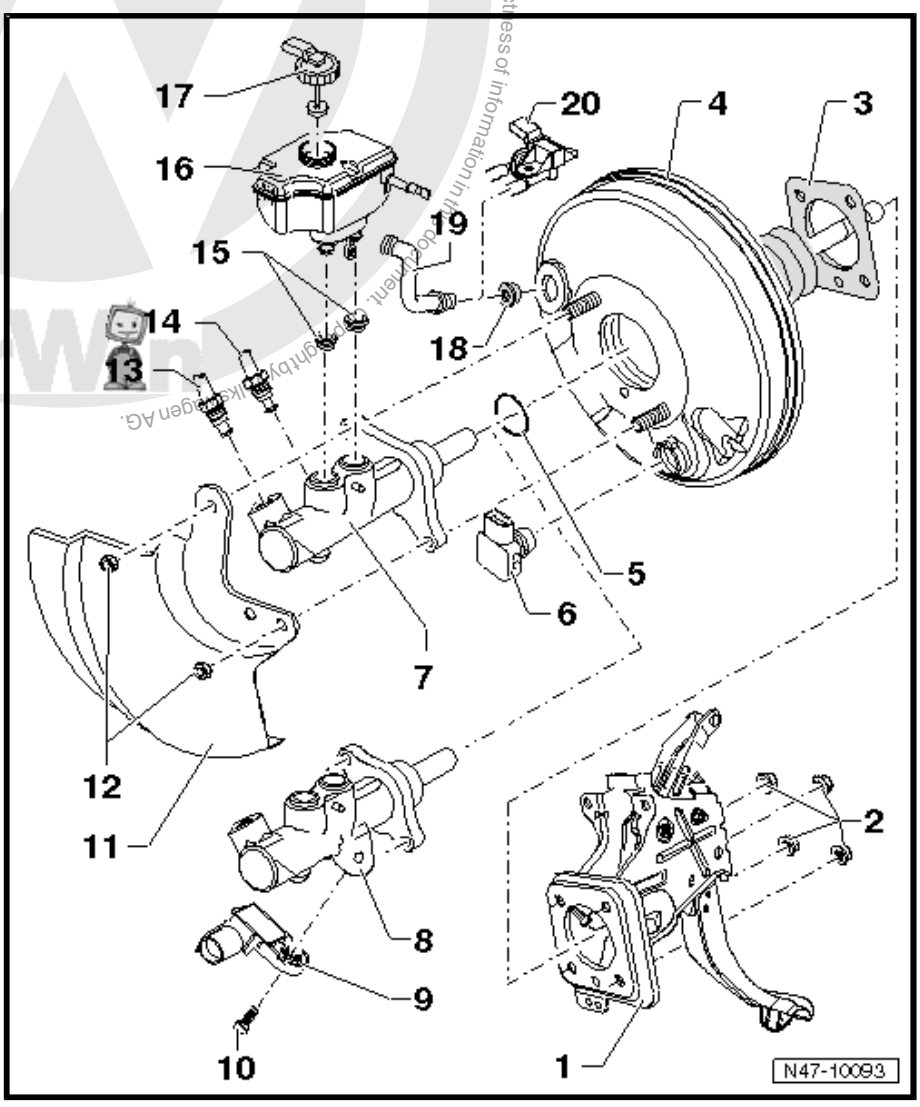
⇒ Maintenance ; Booklet 18.1

5 Brake servo and master brake cylinder

5.1 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

2 - Self-locking hexagon nut, 25 Nm

- ❑ Always renew after removing

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 137
- ❑ A vacuum sender is fitted in vehicles with HBV ⇒ page 62 .
- ❑ Diesel engines are fitted with an exhauster to create the required vacuum ⇒ page 136 .
- ❑ 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 141

5 - Sealing ring

6 - Brake servo vacuum sender -G483-

- ❑ Only on vehicles having HBV

- ❑ Removing and installing ⇒ page 62

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 139

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 139

9 - Brake light switch -F-

- ❑ Including brake pedal switch -F47- .
- ❑ In vehicles prior to week 45/2005, the brake light switch -F- is located on the brake pedal ⇒ page 109 .
- ❑ Removing and installing ⇒ page 138

10 - Torx socket head bolt, 5 Nm

11 - Heat shield

12 - Self-locking hexagon nut, 25 Nm

- ❑ 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

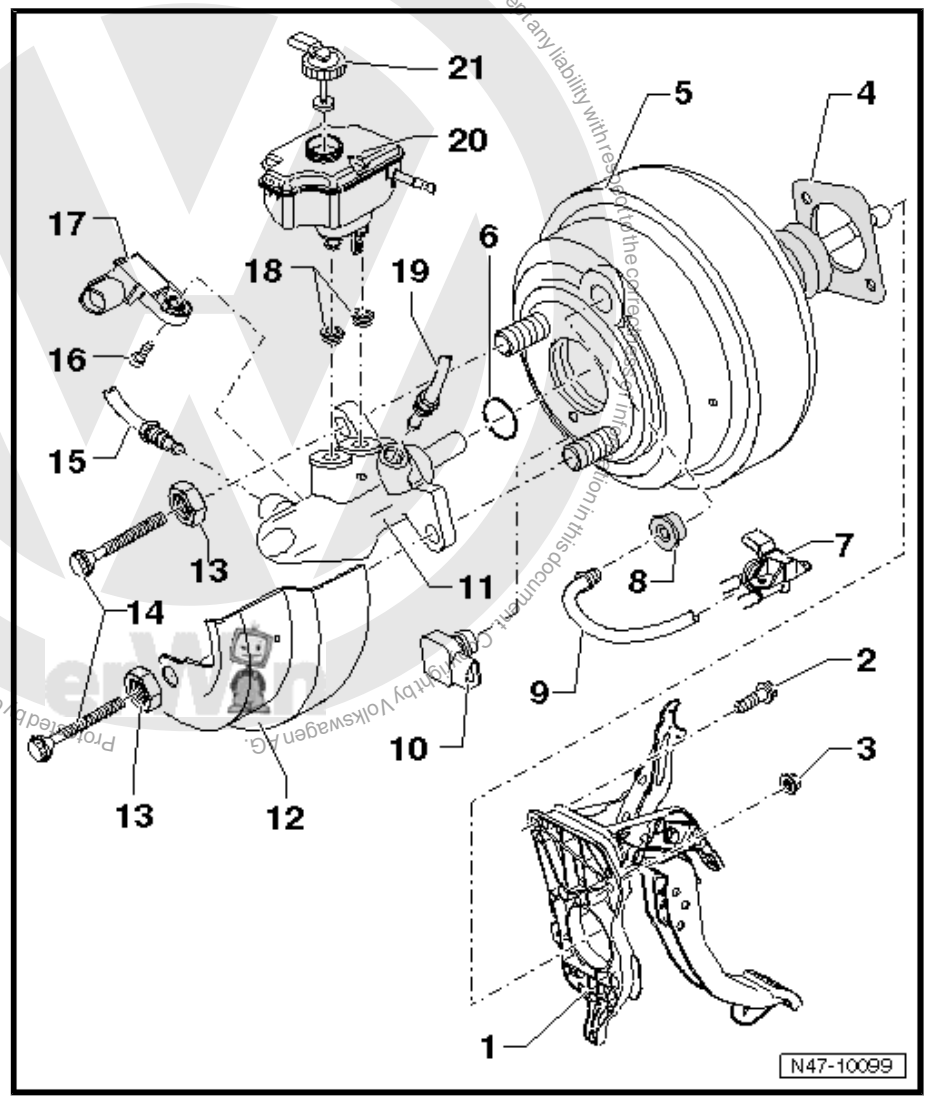
20 - Brake servo pressure sensor -G294-

- ❑ On vehicles with FSI engine without HBV (Hydraulic Brake with Vacuum servo)
- ❑ Removing and installing ⇒ page 137

5.2 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 - Hexagon bolt, 25 Nm

3 - Self-locking hexagon nut, 25 Nm

- ❑ 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- . ⇒ page 137
- ❑ A vacuum sender is fitted in vehicles with HBV ⇒ page 62 .
- ❑ Diesel engines are fitted with an exhauster to create the required vacuum ⇒ page 136 .
- ❑ 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 141

6 - Sealing ring

7 - Brake servo pressure sensor -G294-

- ❑ On vehicles with FSI engine without HBV (Hydraulic Brake with Vacuum servo)
- ❑ Removing and installing ⇒ page 137

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 62

11 - Brake master cylinder

- ❑ With brake light switch -F- from week 45/2005
- ❑ In vehicles prior to week 45/2005, 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 139

12 - Heat shield

13 - Hexagon nut, 50 Nm

14 - Twelve point bolt, 25 Nm

15 - Brake line, 14 Nm

❑ From secondary piston circuit of brake master cylinder to hydraulic unit

16 - Torx socket head bolt, 5 Nm

17 - Brake light switch -F-

❑ Including brake pedal switch -F47- .

❑ In vehicles prior to week 45/2005, the brake light switch -F- is located on the brake pedal ⇒ page 109 .

❑ Removing and installing ⇒ page 138

18 - Sealing plug

❑ Moisten with brake fluid and press into brake fluid reservoir.

19 - Brake line, 14 Nm

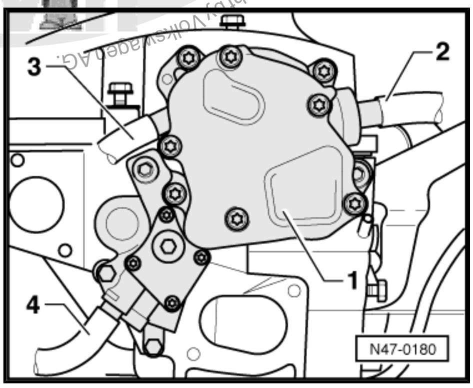
❑ From primary piston circuit of brake master cylinder to hydraulic unit

20 - Brake fluid reservoir

21 - Cap

5.3 Overview - exhauster pump for brake servo (diesel vehicles)

Exhauster pump for 4-cylinder diesel engine (2-valve):



Must not be dismantled.

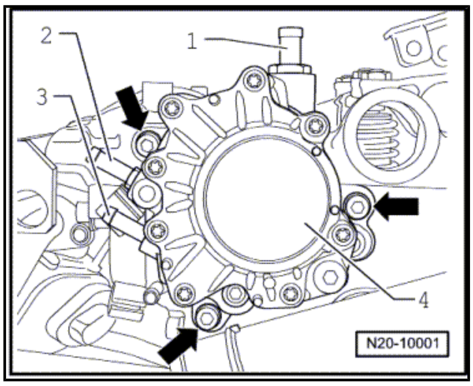
Tandem pump -1- (exhauster pump and fuel pump)

Vacuum hose to brake servo -2- with non-return valve.

Fuel lines -3 and 4-.

– Removing and installing tandem pump ⇒ 4-cylinder diesel engine (2-valve); Rep. Gr. 20 ; Removing and installing parts of fuel supply system .

Exhauster pump for 4-cylinder diesel engine (4-valve):



Must not be dismantled.

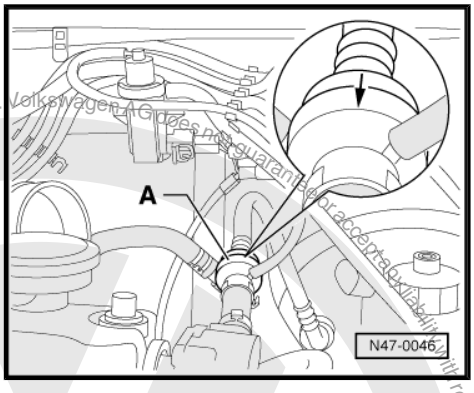
Tandem pump -4- (exhauster pump and fuel pump)

Vacuum hose to brake servo -1- with non-return valve.

Fuel lines -2 and 3-.

– Removing and installing tandem pump ⇒ 4-cylinder diesel engine (4-valve); Rep. Gr. 20 ; Removing and installing parts of fuel supply system .

5.4 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!

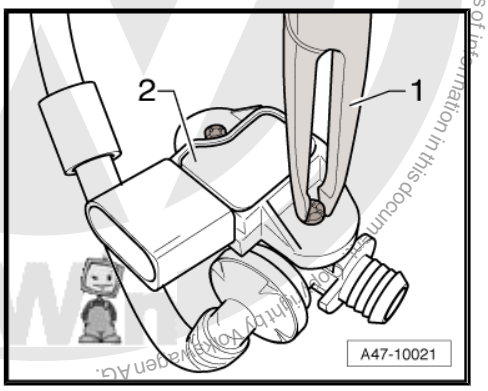
5.5 Removing and installing brake servo pressure sensor -G294-

– 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-.



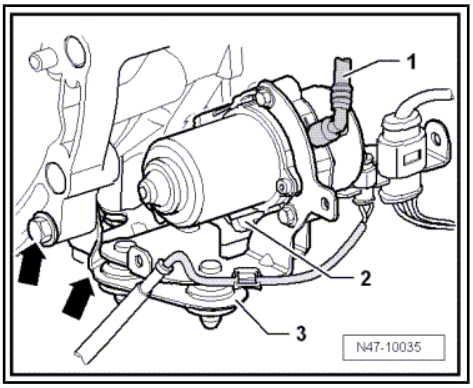
5.6 Vacuum pump for brakes -V192-

Installation 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- .

5.6.1 Removing



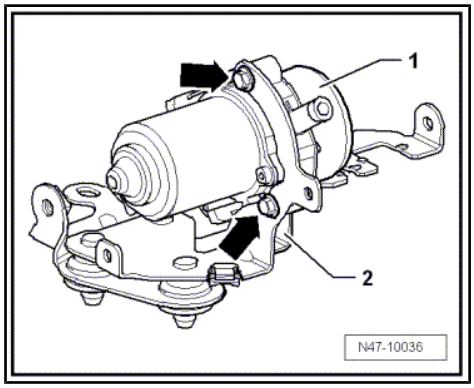
– Pull vacuum hose -1- off vacuum pump for brakes -V192- .

– 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-.



5.6.2 Installing

Install in reverse order.

Specified torques:	
Brake vacuum pump -V192- to bracket	8 Nm
Bracket to automatic gearbox	25 Nm

5.7 Removing and installing brake light switch -F- as of week 45/05

In vehicles prior to week 45/05, brake light switch was located on brake pedal.

Removing

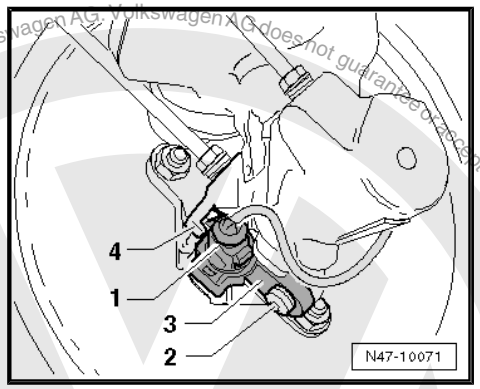
– Remove engine cover panel.

– 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

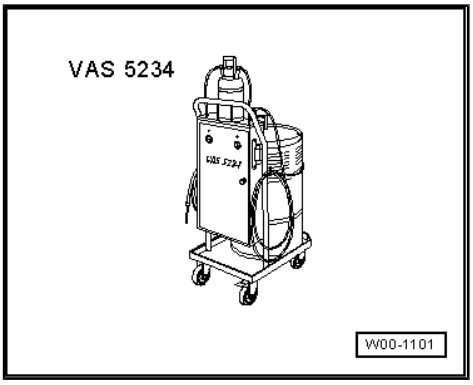
– Install in reverse order.

Specified torque:	
Torx bolt on brake master cylinder	5 Nm

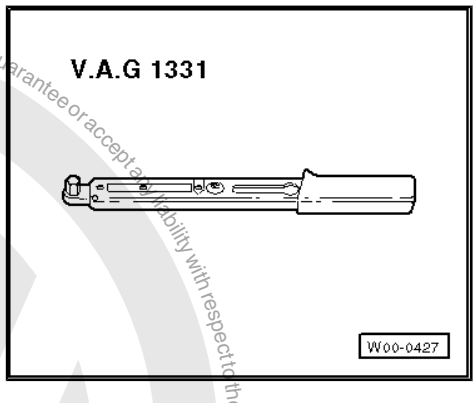
6 Removing and installing brake master cylinder

Special tools and workshop equipment required

- Brake filling and bleeding equipment -VAS 5234-



- Torque wrench -V.A.G 1331-



6.1 Removing

– Note or request radio code on vehicles with coded radio if necessary.

– Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

– Removing and installing battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .

Except for Eos V6; in this case, remove air filter housing.

– Remove battery trim.

– 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- .

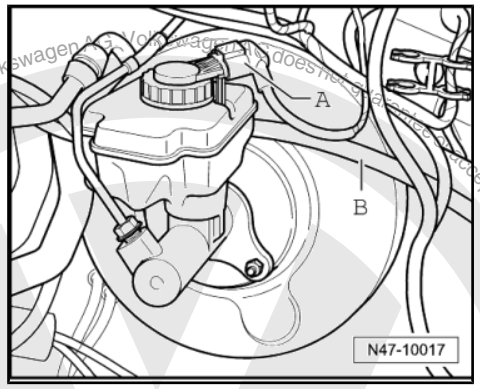
Vehicles with manual gearbox:

– Detach supply hose -B- for clutch master cylinder, lift clear and tie in place, or clamp off supply hose -B- for clutch master cylinder with a commercially available tool, e.g. Hazet 4590, and then pull off.

Continuation for all vehicles:

– Pull connector -A- off float warning indicator sender.

– Separate connector from brake light switch -F- (vehicles from week 45/2005 only).



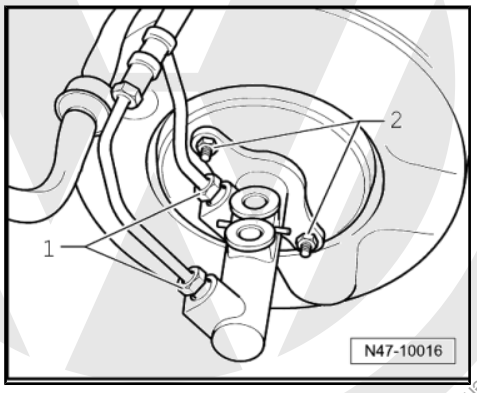
– Remove brake fluid reservoir. To do this press locking tabs on reservoir outwards and simultaneously pull brake fluid reservoir out of sealing plugs.

– Disconnect brake lines -1- on brake master cylinder and seal brake lines with plugs from repair kit Part No. 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.



6.2 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.

– Bleed brake system ⇒ page 130 .

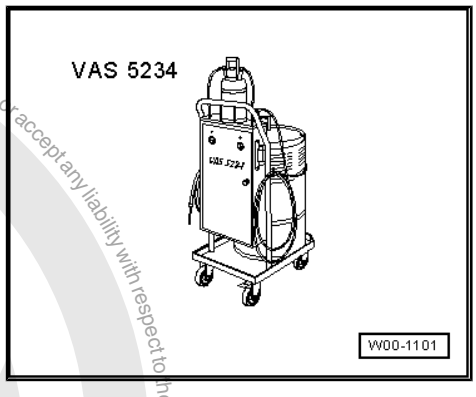
Specified torques:

Brake master cylinder to brake servo ♦ Use new nuts!	25 Nm
Brake lines to brake master cylinder	14 Nm

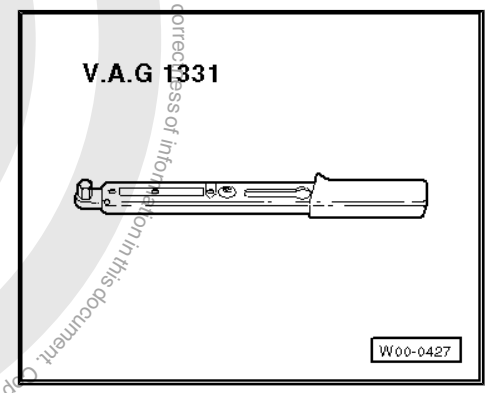
7 Removing and installing brake servo

Special tools and workshop equipment required

- Brake filling and bleeding equipment -VAS 5234-



- Torque wrench -V.A.G 1331-



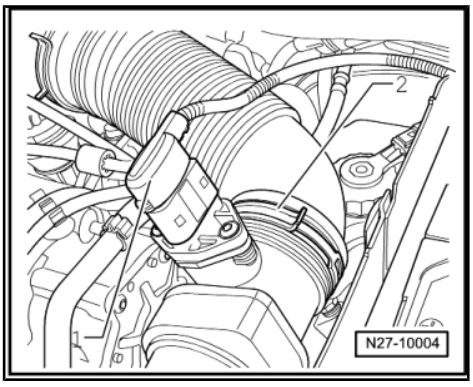
7.1 Removing

– Note or request radio code on vehicles with coded radio if necessary.

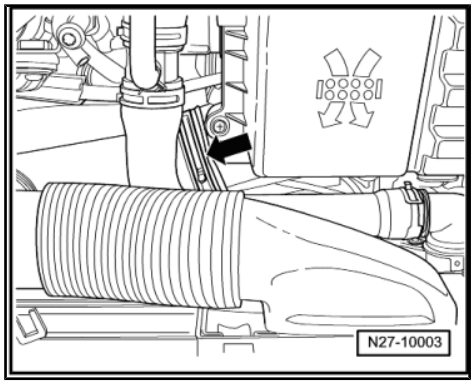
– Disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and reconnecting battery .

Vehicles with diesel engine:

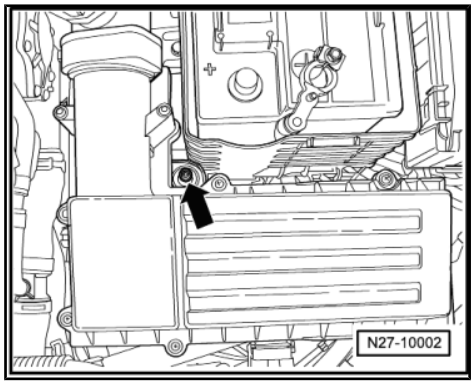
– Disconnect wiring connector -1- and loosen rear spring-type clip on intake hose.



– 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.

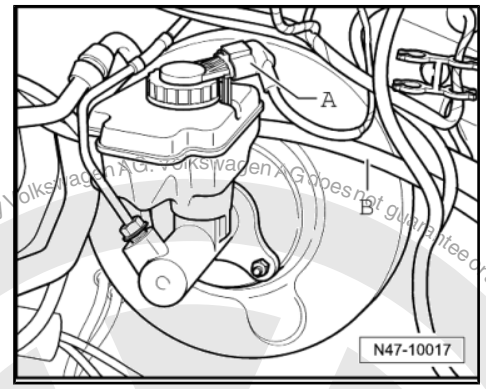


Continuation for all vehicles:

– Removing and installing battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .
– 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 gearbox:

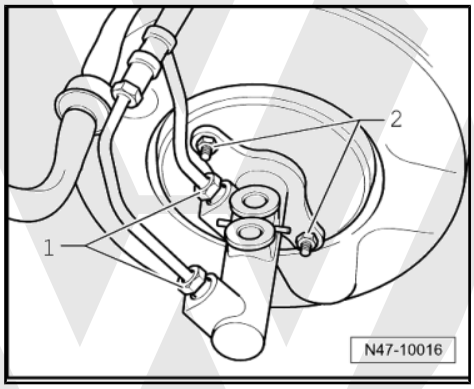
– Detach supply hose -B- for clutch master cylinder, lift clear and tie in place, or clamp off supply hose -B- for clutch master cylinder with a commercially available tool, e.g. Hazet 4590, and then pull off.



Continuation for all vehicles:

– Pull connector -A- off float warning indicator sender.
– Separate connector from brake light switch -F- (vehicles from week 45/2005 only).

– 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- on brake master cylinder and seal brake lines with plugs from repair kit Part No. 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.



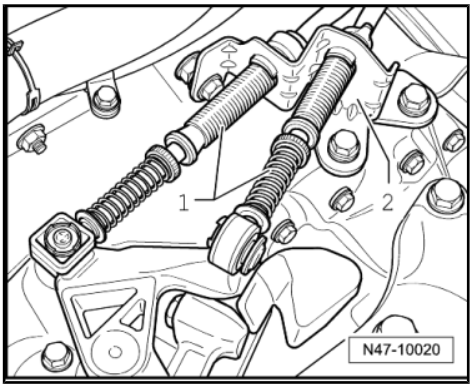
Vehicles with manual gearbox:

– Release cables -1-, unbolt support bracket -2- and place it to side ⇒ Rep. Gr. 34 ; Repairing selector mechanism .

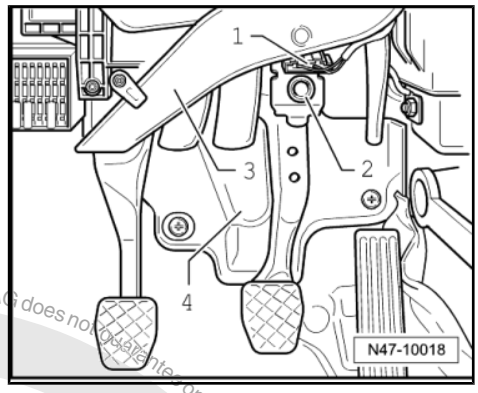
Continuation for all vehicles:

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

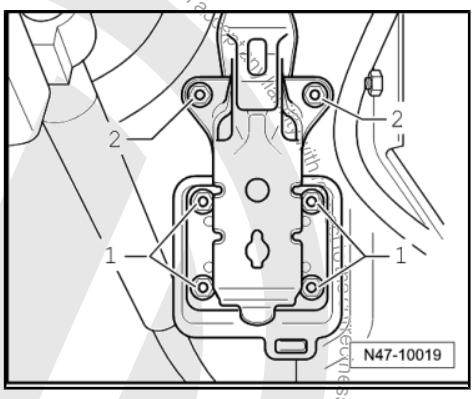
From week 45/2005, the brake light switch is no longer located on the mounting bracket.



– Pull connector -1- off brake light switch.
– Remove brake light switch -2- by turning 45° to left.
– Remove air duct -3-.
– Remove cover -4-.
– Separate brake pedal from brake servo ⇒ page 109 .



– Unscrew nuts -1- from brake servo.
– Remove both upper nuts -2- from mounting bracket.
– Carefully remove brake servo from vehicle.



7.2 Installing

– Install in reverse order.

Observe following points when installing:

– Clip brake pedal to brake servo ⇒ page 110 .
– After installing, bleed brake system ⇒ page 130 and clutch.

Vehicles up to week 45/2005 only:

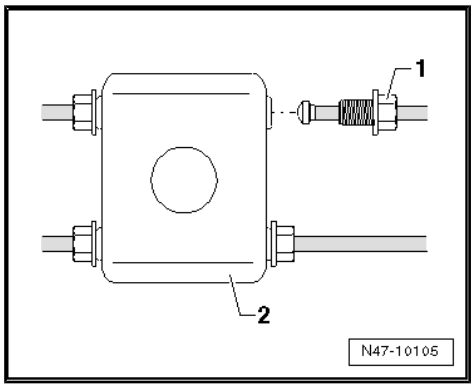
– Install brake light switch ⇒ page 110 .

Specified torques:

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

8 Brake lines

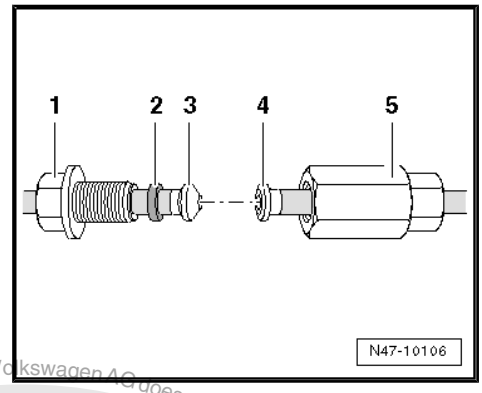
8.1 Separating point on underbody



Old connection:

1 - Union nut, 14 Nm

2 - T-piece, counterhold when tightening.



New connection:

1 - Union nut, 14 Nm

2 - Ring

3 - Flange F

4 - Flange E, cannot be pinched

5 - Nut, counterhold when tightening.

8.2 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.

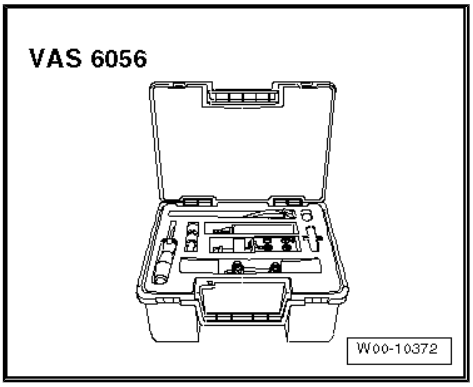
The use of flanging tool V.A.G. 1356 is not permitted due to the coating and the diameter of the black brake lines.

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-

- ❑ Flanging tool -VAS 6056/1- contains flanging jaws -VAS 6056/6-

2 - Pipe cutter -VAS 6056/2-

3 - Brake line scraper -VAS 6056/3-

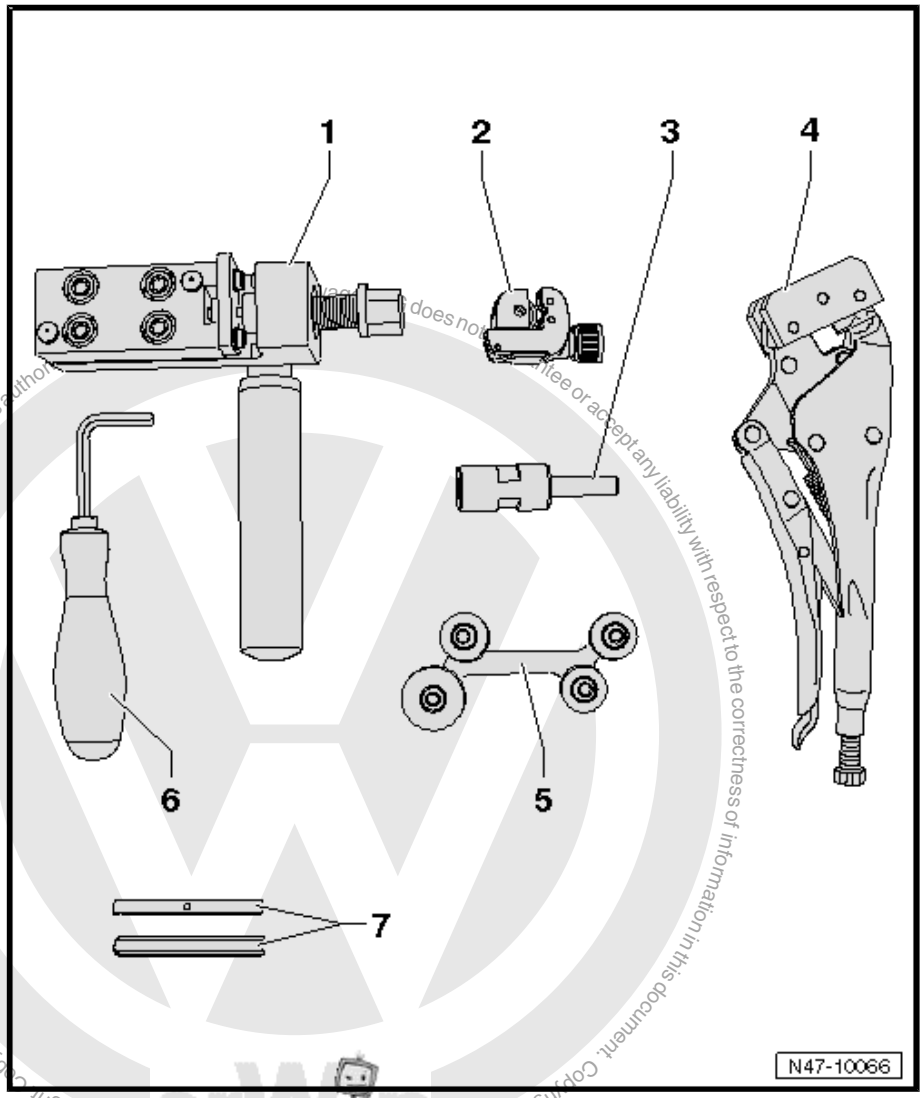
- ❑ Grub screws (in shaft and at side) are adjusted and must not be readjusted!

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-



8.2.1 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

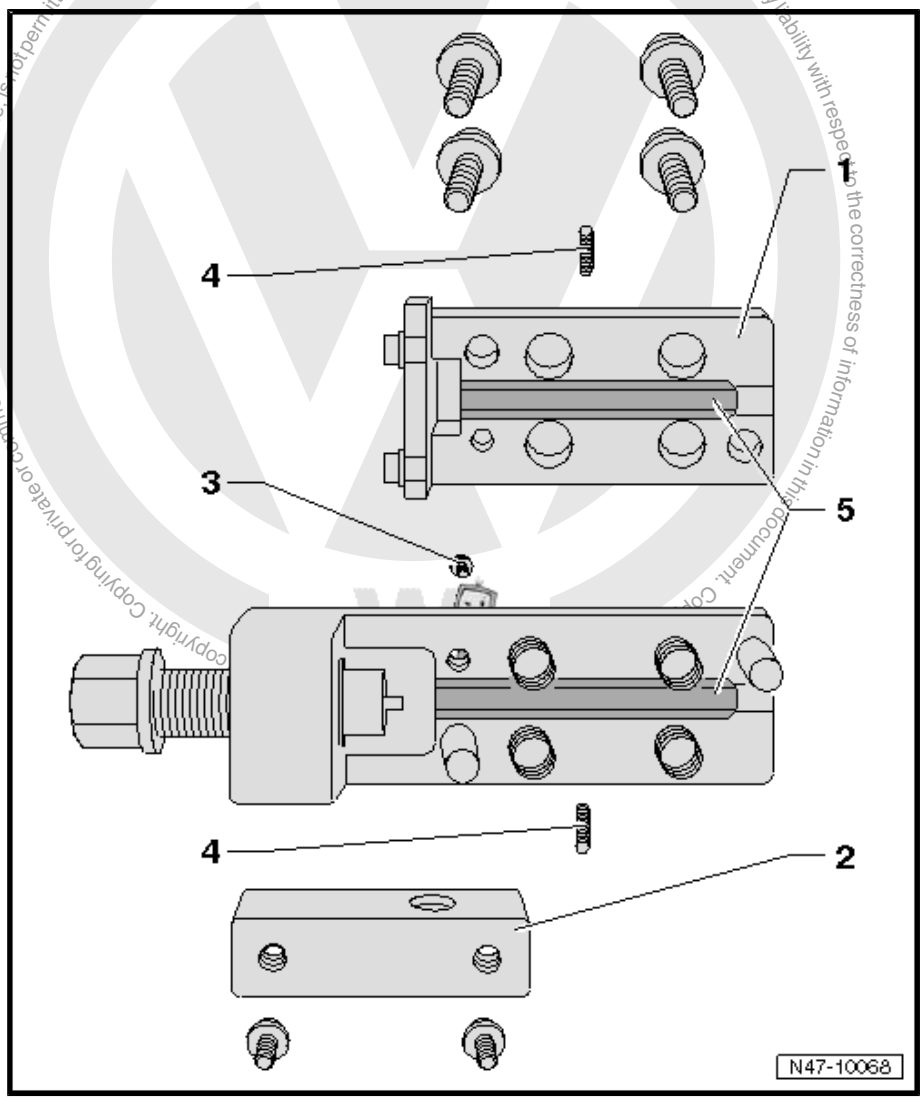
- ❑ For flanging tool upper part

4 - Grub screws for flanging jaws

- ❑ For centring and holding flanging jaws
- ❑ Hexagon socket head bolt, 2 mm

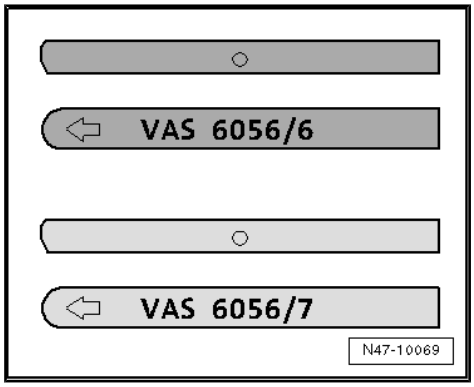
5 - Flanging jaws

- ❑ Various
- ❑ Assembly instructions ⇒ page 146



Flanging jaw assembly instructions:

- ♦ VAS 6056/6 (dark) for black brake lines
- ♦ VAS 6056/7 (light) for green brake lines



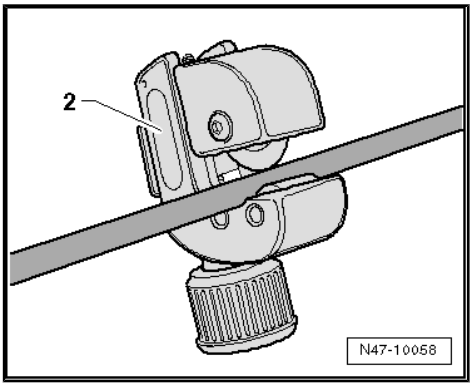
Note

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.

8.2.2 Work instructions

– Unbolt relevant brake line at brake caliper or wheel brake cylinder; catch escaping brake fluid and dispose of this as per regulations.

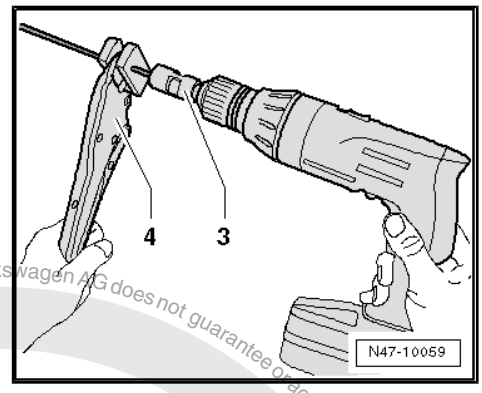
– Cut through brake line at a suitable point (straight, freely accessible section) with pipe cutter -2-.
– Remove section to be renewed.
– Degrease brake line surface.



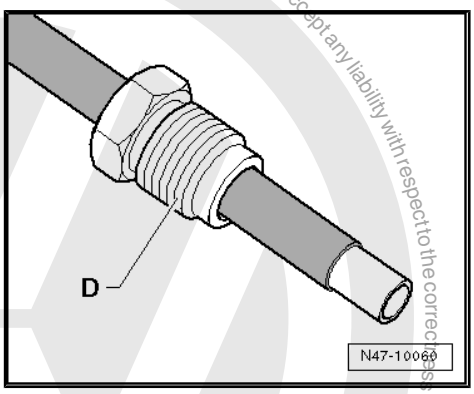
– Clamp brake line tightly in set of grips -4- so that approx. 50 mm project from plastic jaws.
– Clamp scraper -3- into a drill and position onto brake line.
– At slow drill speed and with gentle pressure on brake line, scrape coating off brake line.

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.

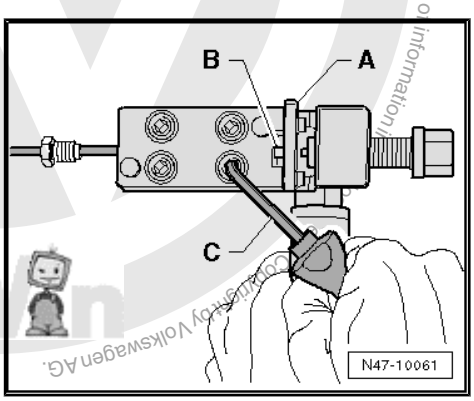


– Slide brake line -B- up to stop -A- in flanging tool.

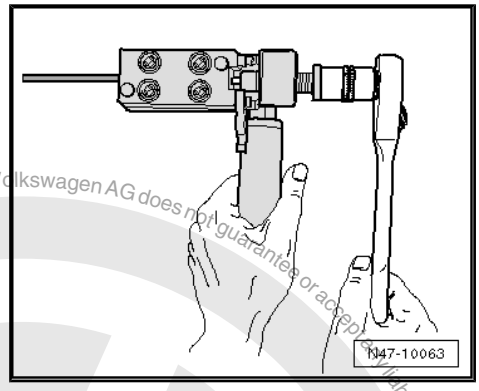
Note

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.
– 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 130 .