



Workshop Manual

up! 2012 ➤

up! 2017 ➤

up! 2020 ➤

Brake system

Edition 10.2019





List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 45 - Anti-lock brake system
- 46 - Brakes - mechanism
- 47 - Brakes - hydraulics



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



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00 – Technical data

1 Safety information

(VRL013516; Edition 10.2019)

⇒ [“1.1 Safety precautions when using testers and measuring instruments during a road test”, page 1](#)

1.1 Safety precautions when using testers and measuring instruments during a road test

Risk of injury caused by unsecured testing and measuring instruments

When the front passenger airbag is triggered in an accident, insufficiently secured testing and measuring instruments become dangerous projectiles.

- Secure testing and measuring instruments on the rear seat.

Or

- Have a second person operate the test and measuring equipment on the rear seat.



2 Identification

⇒ "2.1 Allocation of PR number - brakes", page 2

2.1 Allocation of PR number - brakes

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

In this example the vehicle is equipped with the following brakes:

- ◆ Arrow 1 - Rear brakes - 1KM
- ◆ Arrow 2 - Front brakes - 1LA

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

The following table explains the PR numbers. These are important for combining the brake caliper/brake disc/brake drum and brake pads.

- ◆ Allocation ⇒ Electronic Parts Catalogue (ETKA)

WVWZZZAAZCD000178		CHY	
3A1		121	
1213A1 up! 1,0 move 44 KW			
NTK LC9X JS MSF CHY			
X0A	B0A	C1L	G0C H9Y J0A DG0
1AT	1G1	1ME	1NL 5RQ 5SL TH4
3S0	3U4	0G0	8UA 8GG 8ZG
1KM	1LA	-	G01 7MG
0	4	4X1	4R1 4K3 N4H 5MB
BRL	1	2	
1JA	L03	0YA	
N00-10954			

2.1.1 Front brakes

Engine	PR number	Front brake
1.0l - 44 kW	1LA / 1ZQ	FS III (14")
1.0l - 55 kW		
1.0l - 66 kW TSI		
1.0l - 85 kW FSI	1ZE	PC57 (15")

2.1.2 Rear brakes

Drum brakes

Engine	PR number	Rear brake
1.0l - 44 kW	1KM	TB 200 X 40
1.0l - 55 kW		
1.0l - 66 kW TSI		
1.0l - 85 kW FSI		



3 Technical data

⇒ [“3.1 Technical data for brakes”, page 3](#)

3.1 Technical data for brakes

⇒ [“3.1.1 Brake master cylinder and brake servo”, page 3](#)

⇒ [“3.1.2 Front brakes”, page 3](#)

⇒ [“3.1.3 Rear brake \(drum brake\)”, page 4](#)

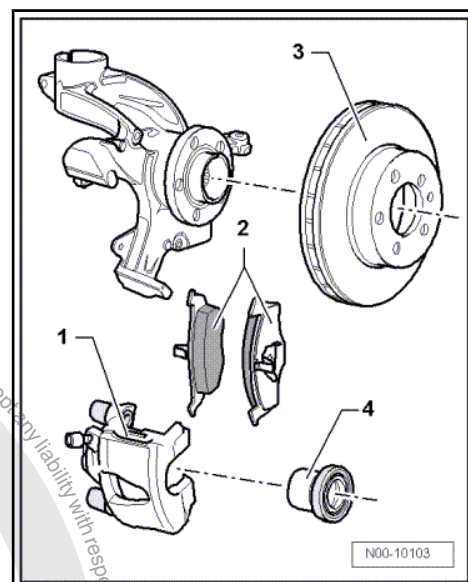
3.1.1 Brake master cylinder and brake servo

Brake master cylinder	Diameter in mm	20.64
Brake servo (left-hand drive vehicles)	Ø in inches	9
Brake servo (RHD vehicles)	Ø in inches	8.5

3.1.2 Front brakes

Front brakes FS III:

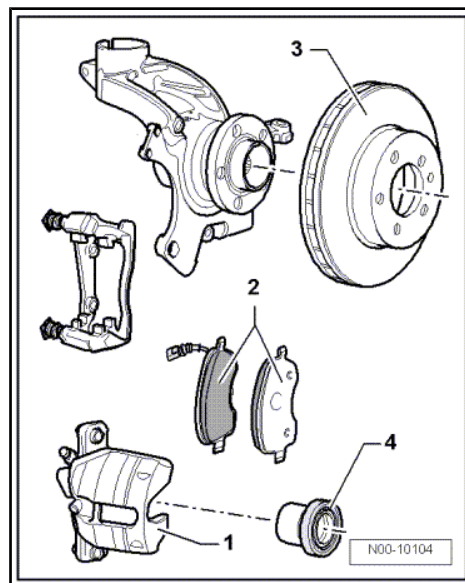
Item	PR number		1LA / 1ZQ
1	Brake caliper		FS III (14")
2	Brake pad, thickness	mm	14
	Brake pad, wear limit without backplate	mm	2
3	Brake disc	Diameter in mm	256
	Brake disc, thickness	mm	22
	Brake disc, wear limit	mm	19
4	Brake caliper piston	Diameter in mm	54





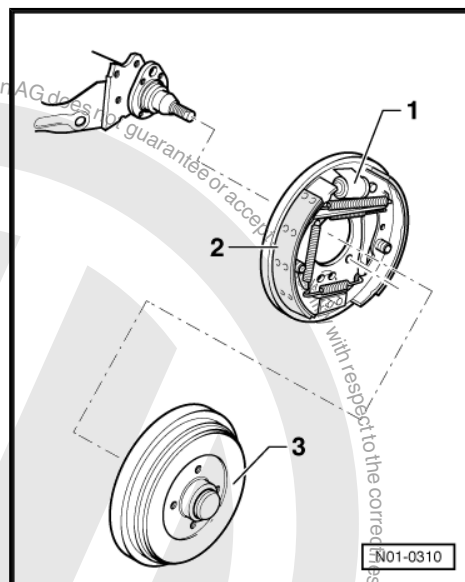
Front brake PC57 (15"):

Item	PR number		1ZE
1	Brake caliper		PC57 (15")
2	Brake pad, thickness	mm	14
	Brake pad, wear limit without backplate	mm	2
3	Brake disc	Diameter in mm	288
	Brake disc, thickness	mm	25
	Brake disc, wear limit	mm	22
4	Brake caliper piston	Diameter in mm	57



3.1.3 Rear brake (drum brake)

Item	PR number		1KM
1	Wheel brake cylinder	mm	17.64
2	Brake lining, width	mm	40
	Brake pad, thickness	mm	5
	Brake lining, minimal thickness	mm	2.5
3	Brake drum	Diameter in mm	200
	Brake drum, wear limit	Diameter in mm	201.5





4 Brake test

⇒ [“4.1 General information”, page 5](#)

⇒ [“4.2 Checking vehicles with front-wheel drive”, page 5](#)

4.1 General information

- ◆ The drive is provided by the test rig.
- ◆ 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«.
- ◆ When conducting the test, observe the specifications provided by the manufacturer of the test rig.



Note

The brake regulation systems do not function when ignition is off.

4.2 Checking vehicles with front-wheel drive

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

The maximum test speed is 6 km/h.

The test rigs authorised by Volkswagen fulfil these requirements.



45 – Anti-lock brake system

1 General information

The following configurations are possible on vehicles with ABS from TRW:

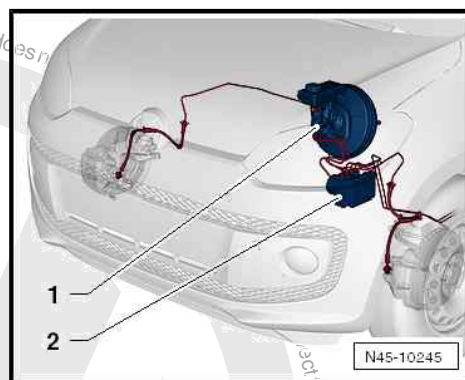
- ◆ ABS
- ◆ ABS/ESP

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

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.

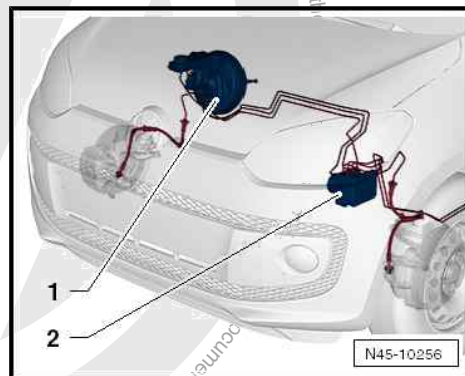
ABS layout in left-hand drive vehicle:

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

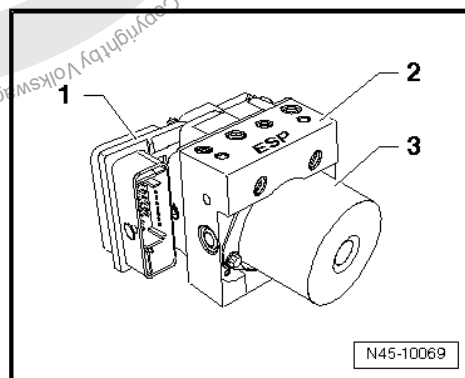


ABS layout in right-hand drive vehicle:

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



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





1.1 Repair instructions for repair work on ABS

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

"Guided fault finding" is carried out using vehicle diagnosis, testing and information system - VAS 5051- .

- ◆ With ignition switched off, disconnect battery earth strap.
- ◆ Before carrying out welding work with an electric welding unit, see ⇒ General Information; Body Repairs, General Body Repairs .
- ◆ When working with brake fluid, observe the relevant safety precautions and notes ⇒ [page 94](#) .
- ◆ After work for which the brake system had to be opened, bleed the brake system with brake filling and bleeding equipment - VAS 5234- ⇒ [page 94](#) .
- ◆ 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 that contain mineral oil, such as oil, grease etc.
- ◆ Thoroughly clean all unions and adjacent areas before loosening. Do not use aggressive cleaning agents such as brake cleaner, petrol, thinners or similar.
- ◆ Place removed parts on a clean surface and cover them over.
- ◆ After separating control unit from hydraulic unit, use transport protection for contact pins.
- ◆ If repair work cannot be performed immediately, cover new parts which have been removed from their packing. (Use sealing plugs from repair kit 1 H0 698 311 A).
- ◆ Use only lint-free cloths.
- ◆ Do not remove replacement parts from packaging until immediately before installation.
- ◆ Only use genuine packed parts.
- ◆ When the system is open, do not work with compressed air or move the vehicle.
- ◆ During painting operations, the electronic control unit can be exposed to a maximum temperature of 95°C for only a short period, and to a maximum of 85°C for longer periods (approx. 2 hours). Ensure that no brake fluid enters connectors.

2 Overview of fitting locations

⇒ "2.1 ABS", page 8

⇒ "2.2 ABS/ESP", page 9

2.1 ABS

1 - ABS control unit - J104-

- ❑ Location: on hydraulic unit, on left in engine compartment, under battery tray.
- ❑ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before separating connector.
- ❑ Removing and installing ⇒ [page 13](#)

2 - ABS hydraulic unit - N55-

The hydraulic unit consists of the components:

- ❑ ABS return flow pump - V39-
- ❑ Valve block (contains inlet and outlet valves).
- ❑ Do not separate ABS return flow pump - V39- and valve block
- ❑ Removing and installing ⇒ [page 13](#)

3 - Traction control system warning lamp - K86-

- ❑ Location: in dash panel insert.

4 - ABS warning lamp - K47-

- ❑ Location: in dash panel insert.

5 - Brake system warning lamp - K118-

- ❑ Location: in dash panel insert.

6 - Handbrake warning lamp - K139-

- ❑ Location: in dash panel insert.

7 - Diagnostic connection

- ❑ Location: Driver footwell cover.

8 - Brake light switch - F-

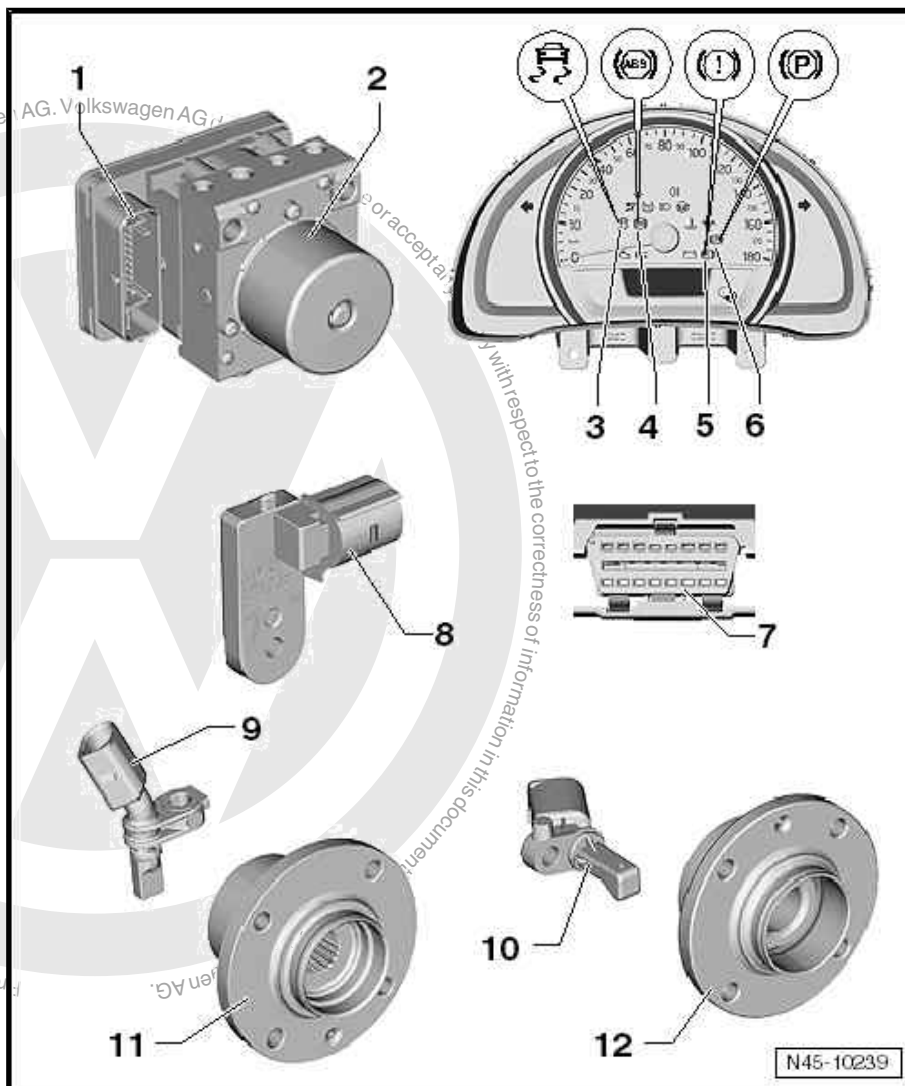
- ❑ Including brake pedal switch - F47- .
- ❑ Removing and installing ⇒ [page 66](#)

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

- ❑ Removing and installing ⇒ [page 24](#)

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

- ❑ Removing and installing (drum brakes) ⇒ [page 26](#)



11 - Wheel hub with wheel bearing

- ☐ ABS sensor ring is installed in wheel bearing.

12 - Wheel hub with wheel bearing

- ☐ ABS sensor ring is installed in wheel bearing.

2.2 ABS/ESP

1 - ABS control unit - J104-

- ☐ Location: on hydraulic unit, on left in engine compartment, under battery tray.
- ☐ Do not separate connector before successfully completing self-diagnosis. Switch ignition off before separating connector.

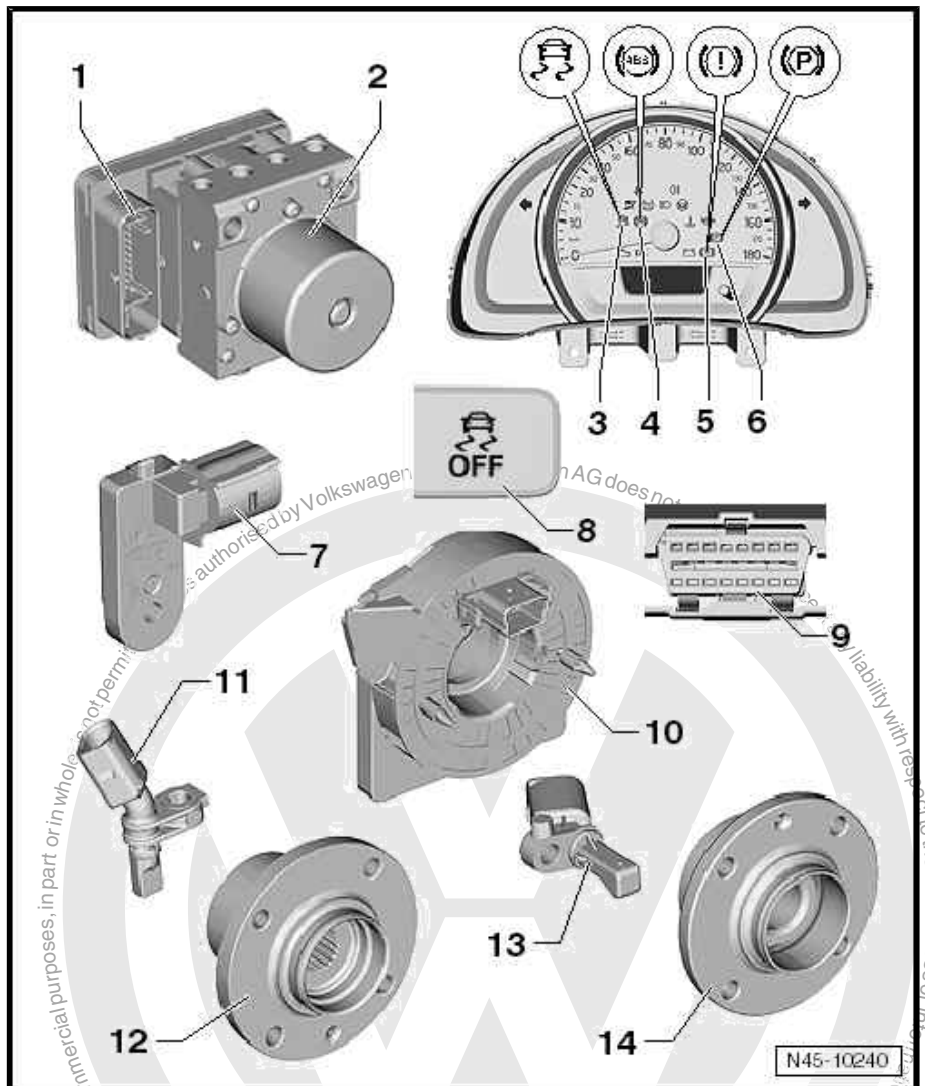
The following components are integrated into the control unit:

- ◆ Lateral acceleration sender - G200-
- ◆ Yaw rate sender - G202-
- ◆ Longitudinal acceleration sender - G251- (depending on equipment fitted)
- ☐ Removing and installing
⇒ [page 13](#)

2 - ABS hydraulic unit - N55-

The hydraulic unit consists of the components:

- ☐ ABS return flow pump - V39-
- ☐ Brake pressure sender - G201-
- ☐ Valve block (contains inlet and outlet valves).
- ☐ Do not separate ABS return flow pump - V39- and valve block
- ☐ Removing and installing
⇒ [page 13](#)



3 - ESP and TCS warning lamp - K155-

- ☐ Location: in dash panel insert.

4 - ABS warning lamp - K47-

- ☐ Location: in dash panel insert.

5 - Brake system warning lamp - K118-

- ☐ Location: in dash panel insert.

6 - Handbrake warning lamp - K139-

- ☐ Location: in dash panel insert.

7 - Brake light switch - F-

- ☐ Including brake pedal switch - F47- .



- ☐ Removing and installing ⇒ [page 66](#)

8 - TCS and ESP button - E256-

- ☐ Located in centre console

9 - Diagnostic connection

- ☐ Location: Driver footwell cover.

10 - Steering angle sender - G85-

- ☐ Note different possible fitting locations depending on the steering column installed
- ☐ Fitting location: on steering column between steering wheel and steering column switch ⇒ [page 26](#)
- ☐ Fitting location: on electric steering column ⇒ Vehicle diagnostic tester and ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column
- ☐ For allocation, refer to ⇒ Electronic parts catalogue and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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

- ☐ Removing and installing ⇒ [page 24](#)

12 - Wheel hub with wheel bearing

- ☐ ABS sensor ring is installed in wheel bearing.

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

- ☐ Removing and installing (drum brakes) ⇒ [page 26](#)

14 - Wheel hub with wheel bearing

- ☐ ABS sensor ring is installed in wheel bearing.

3 Control unit and hydraulic unit

⇒ [“3.1 Assembly overview - control unit and hydraulic unit”, page 11](#)

⇒ [“3.2 Removing and installing control unit and hydraulic unit”, page 13](#)

⇒ [“3.3 Connecting brake lines to hydraulic unit”, page 21](#)

3.1 Assembly overview - control unit and hydraulic unit

1 - Brake servo

- ☐ Removing and installing
⇒ [page 74](#)

2 - Brake line

- ☐ To front right brake caliper
- ☐ Marked on hydraulic unit with -VR-.
- ☐ With thread M10 x 1
- ☐ 14 Nm

3 - Brake line

- ☐ To rear left wheel brake cylinder
- ☐ Marked on hydraulic unit with -HL-.
- ☐ With thread M12 x 1
- ☐ 14 Nm

4 - Brake line

- ☐ To rear right wheel brake cylinder
- ☐ Marked on hydraulic unit with -HR-.
- ☐ With thread M10 x 1
- ☐ 14 Nm

5 - Brake line

- ☐ To front left brake caliper
- ☐ Marked on hydraulic unit with -VL-.
- ☐ With thread M12 x 1
- ☐ 14 Nm

6 - ABS control unit - J104-

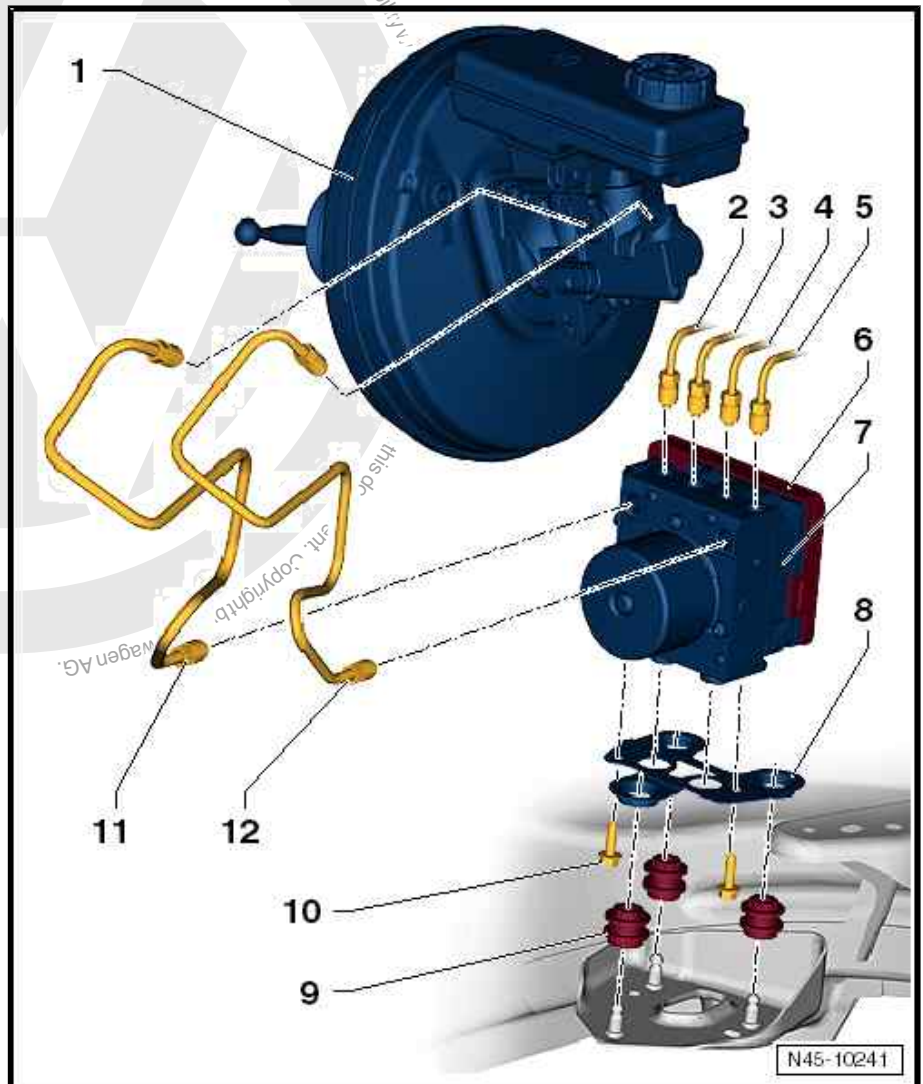
- ☐ Removing and installing ABS hydraulic unit - N55- with ABS control unit - J104- ⇒ [page 13](#)

7 - ABS hydraulic unit - N55-

- ☐ Do not separate ABS return flow pump - V39- and valve block
- ☐ When renewing the hydraulic unit, always seal the old part with plugs from repair kit - 1H0 698 311 A- .
- ☐ Removing and installing ABS hydraulic unit - N55- with ABS control unit - J104- ⇒ [page 13](#)

8 - Bracket

- ☐ Allocation ⇒ Electronic parts catalogue “ETKA”





9 - Rubber damper

10 - Hexagon bolt

- ☐ 8 Nm

11 - Brake line

- ☐ Brake master cylinder/primary piston circuit to hydraulic unit
- ☐ With thread M12 x 1
- ☐ 14 Nm

12 - Brake line

- ☐ Brake master cylinder/secondary piston circuit to hydraulic unit
- ☐ With thread M12 x 1
- ☐ 14 Nm





3.2 Removing and installing control unit and hydraulic unit

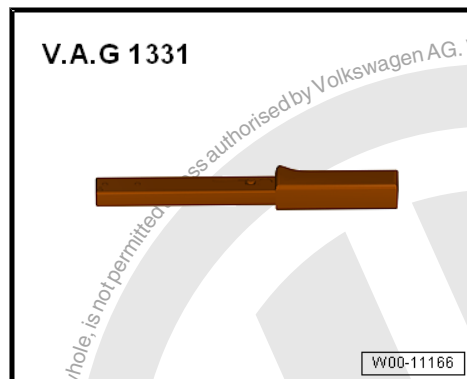
⇒ “3.2.1 Removing and installing control unit and hydraulic unit, LHD”, page 13

⇒ “3.2.2 Removing and installing control unit and hydraulic unit, right-hand drive”, page 17

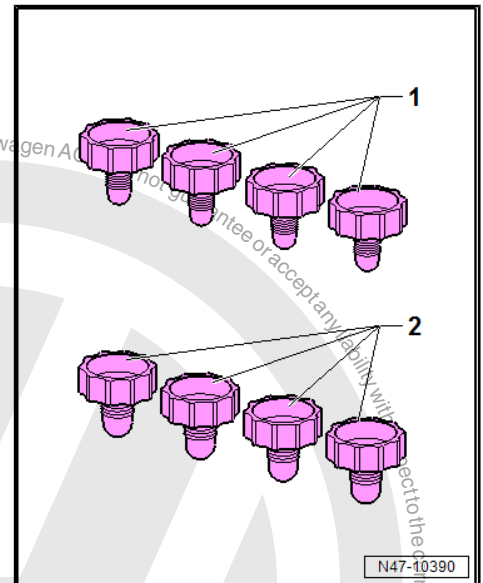
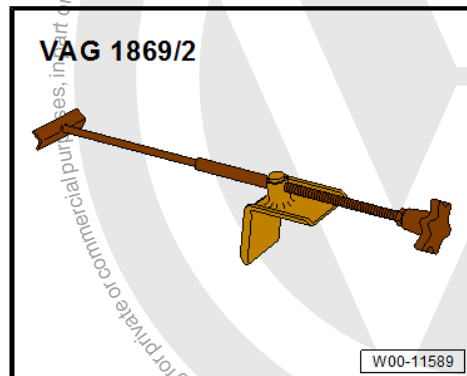
3.2.1 Removing and installing control unit and hydraulic unit, LHD

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



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



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

Fitting location:

The control unit is bolted to the hydraulic unit and is located on left in the engine compartment, under the battery tray.

! NOTICE

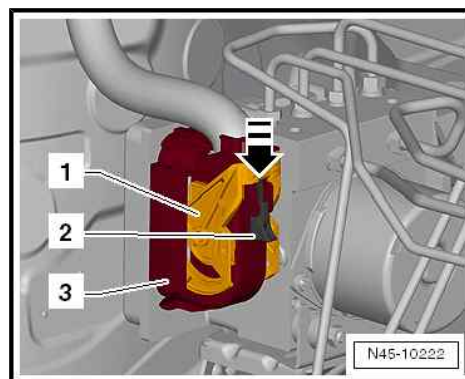
Risk of damage to brake lines if bent.

- Never excessively bend the brake lines in the area of the hydraulic unit.



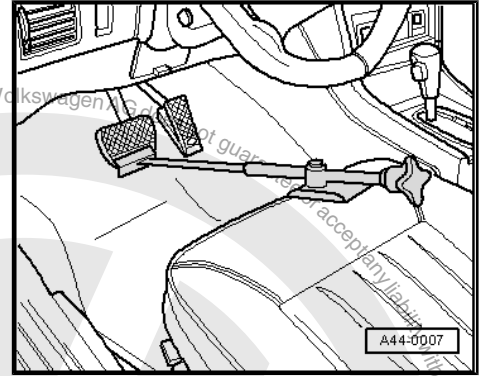
Removing:

- Read out and note the existing control unit code.
- Note or request radio code on vehicles with coded radio if necessary.
- Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Unbolt engine control unit with bracket and lay to side ⇒ Rep. gr. 24 ; Engine control unit; Assembly overview - engine control unit .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Lay out sufficient lint free clothes 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- .
- Press locking slide -2- downwards in -direction of arrow-.
- Press retaining bar -1- downwards in -direction of arrow- in order to unlock connector -3-.
- Pull connector towards front off control unit.

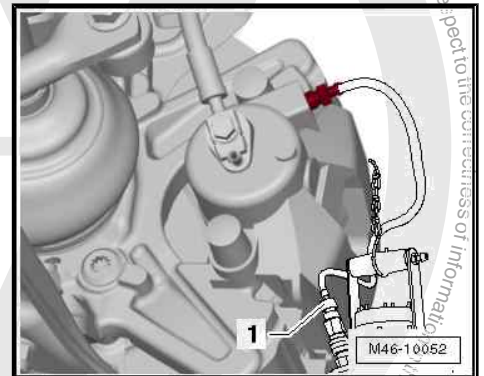




- Apply brake pedal depressor - V.A.G 1869/2- .

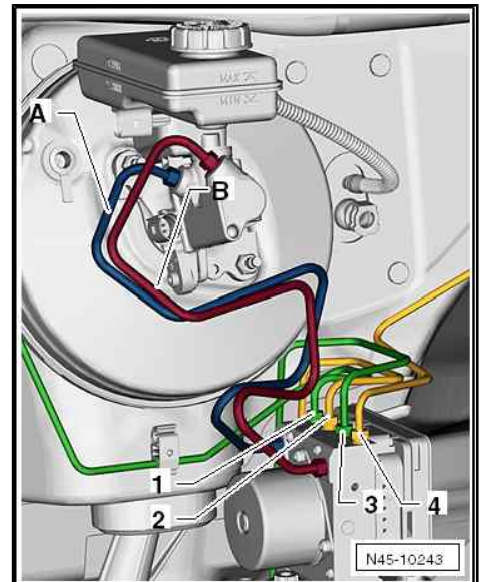


- Connect hose of bleeder bottle -1- to bleeder valve of front left brake caliper.
- Open bleeder valve.
- Connect bleed hose of bleed bottle to bleed valve of rear left wheel brake cylinder.
- Open bleeder valve.
- Depress brake pedal at least 60 mm using brake pedal depressor - V.A.G 1869/2- .
- Close 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.

- Mark brake lines from hydraulic unit -A and B- to brake master cylinder.
- Unscrew brake lines -A and B- from brake master cylinder and hydraulic unit and immediately seal threaded holes with plugs from repair kit Part No. 1H0 698 311 A.
- Mark remaining brake lines (to brake calipers) -1 to 4-, unscrew them from hydraulic unit and immediately seal threaded holes with plugs from repair kit Part No. 1H0 698 311 A.
- Fit dust caps of bleeder valves onto brake lines.





- Pull ABS hydraulic unit - N55- -1- together with ABS control unit - J104- and bracket upwards in -direction of arrow- off welded studs.

Installing:

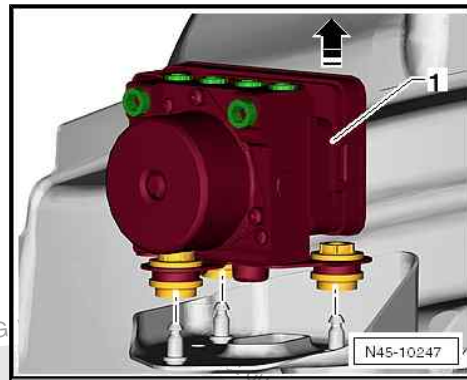


Note

- ◆ 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 seated correctly in bracket.
- Continue installation in reverse order of removal.
 - Remove brake pedal actuator - V.A.G 1869/2- .
 - Bleed brake system ⇒ [page 94](#) .
 - Code ABS control unit - J104- using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.
 - Code radio.

Specified torques:

- ◆ ⇒ [“3.1 Assembly overview - control unit and hydraulic unit”, page 11](#)
- ◆ Battery ⇒ Electrical system; Rep.gr. 27 ; Battery; Assembly overview - battery
- ◆ Front bleeder valves
⇒ [“1.1.1 Assembly overview - brake caliper FS III”, page 57](#)
- ◆ Rear bleeder valves
⇒ [Fig. “Wheel brake cylinder” , page 44](#)

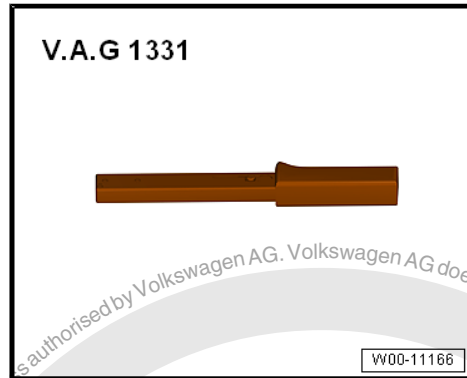




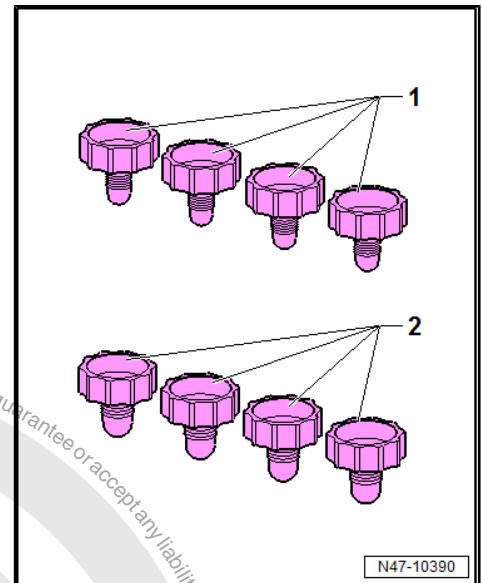
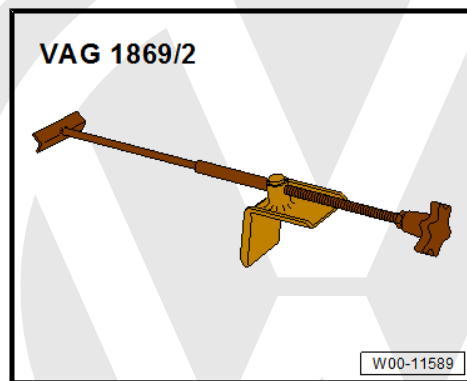
3.2.2 Removing and installing control unit and hydraulic unit, right-hand drive

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



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



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

Fitting location:

The control unit is bolted to the hydraulic unit and is located on left in the engine compartment, under the battery tray.



NOTICE

Risk of damage to brake lines if bent.

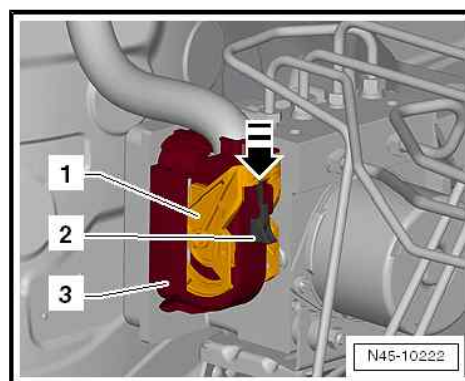
- Never excessively bend the brake lines in the area of the hydraulic unit.

Removing:

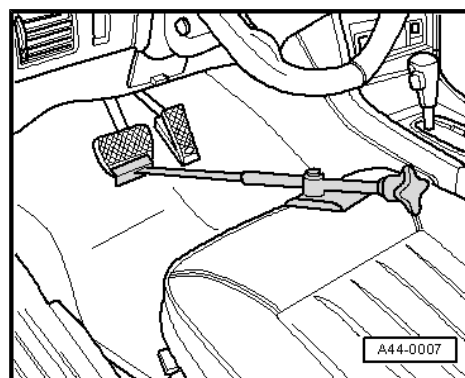
- Read out and note the existing control unit code.
- Note or request radio code on vehicles with coded radio if necessary.



- Remove battery ⇒
Electrical system;
Rep. gr. 27 ; Battery;
Removing and installing battery
- Unbolt engine control unit with bracket and lay to side ⇒ Rep. gr. 24 ; Engine control unit; Assembly overview - engine control unit .
- Remove battery tray
⇒ Electrical system;
Rep. gr. 27 ; Battery;
Removing and installing battery tray .
- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Lay out sufficient lint free clothes 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- .
- Press locking slide -2- downwards in -direction of arrow-.
- Press retaining bar -1- downwards in -direction of arrow- in order to unlock connector -3-.
- Pull connector towards front off control unit.

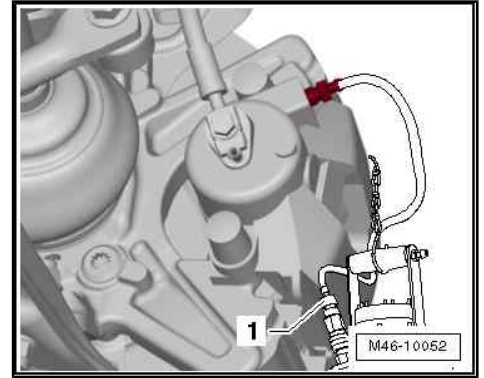


- Apply brake pedal depressor - V.A.G 1869/2- .



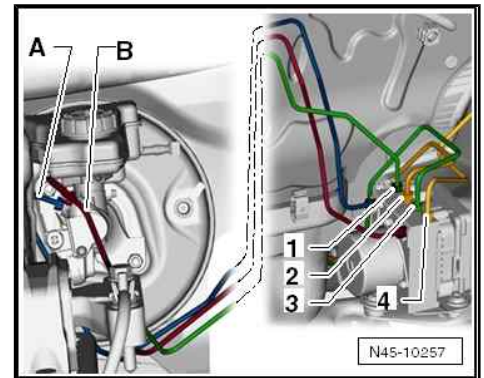


- Connect hose of bleeder bottle -1- to bleeder valve of front left brake caliper.
- Open bleeder valve.
- Connect bleed hose of bleed bottle to bleed valve of rear left wheel brake cylinder.
- Open bleeder valve.
- Depress brake pedal at least 60 mm using brake pedal depressor - V.A.G 1869/2- .
- Close 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.

- Mark brake lines from hydraulic unit -A and B- to brake master cylinder.
- Unclip brake lines from bracket on bulkhead.
- Unscrew brake lines -A and B- from hydraulic unit and immediately seal threaded holes with plugs from repair kit Part No. 1H0 698 311 A.
- Mark remaining brake lines (to brake calipers) -1 to 4-, unscrew them from hydraulic unit and immediately seal threaded holes with plugs from repair kit Part No. 1H0 698 311 A.
- Fit dust caps of bleeder valves onto brake lines.





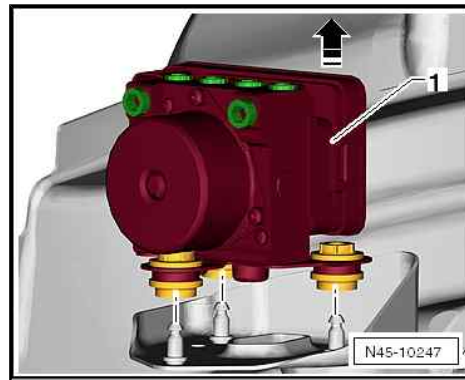
- Pull ABS hydraulic unit - N55- -1- together with ABS control unit - J104- and bracket upwards in -direction of arrow- off welded studs.

Installing:



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 seated correctly in bracket.



- Continue installation in reverse order of removal.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system ⇒ [page 94](#)
- Code ABS control unit - J104- using ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.
- Code radio.

Specified torques:

- ◆ ⇒ ["3.1 Assembly overview - control unit and hydraulic unit", page 11](#)
- ◆ Battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Assembly overview - battery
- ◆ Front bleeder valves
⇒ ["1.1.1 Assembly overview - brake caliper FS III", page 57](#)
- ◆ Rear bleeder valves
⇒ [Fig. "Wheel brake cylinder", page 44](#)



3.3 Connecting brake lines to hydraulic unit

⇒ ["3.3.1 Connecting brake lines to hydraulic unit, LHD", page 21](#)

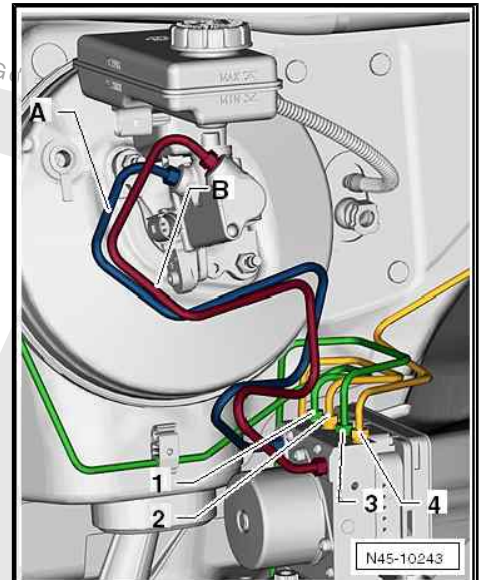
⇒ ["3.3.2 Connecting brake lines to hydraulic unit, RHD", page 21](#)

3.3.1 Connecting brake lines to hydraulic unit, LHD

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

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

- 1 - From hydraulic unit to front right brake caliper.
- 2 - Hydraulic unit to rear left wheel brake cylinder
- 3 - Hydraulic unit to rear right wheel brake cylinder
- 4 - From hydraulic unit to front left brake caliper

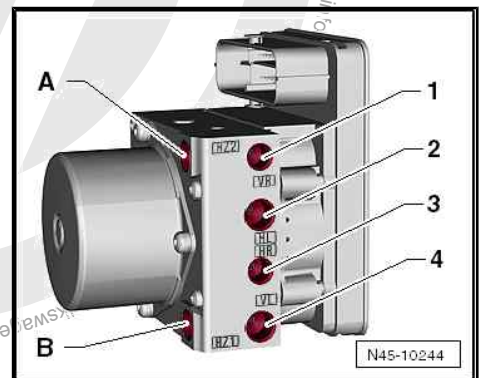


Markings on hydraulic unit:

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

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

- 1 - From hydraulic unit to front right brake caliper.
- Marked on hydraulic unit with -VR-.
- 2 - Hydraulic unit to rear left brake caliper/wheel brake cylinder
- Marked on hydraulic unit with -HL-.
- 3 - Hydraulic unit to rear right brake caliper/wheel brake cylinder
- Marked on hydraulic unit with -HR-.
- 4 - From hydraulic unit to front left brake caliper
- Marked on hydraulic unit with -VL-.

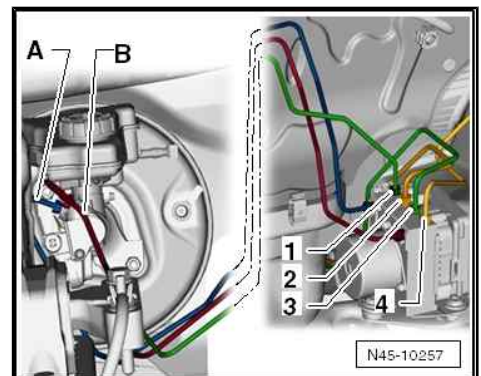


3.3.2 Connecting brake lines to hydraulic unit, RHD

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

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

- 1 - From hydraulic unit to front right brake caliper.
- 2 - Hydraulic unit to rear left wheel brake cylinder
- 3 - Hydraulic unit to rear right wheel brake cylinder
- 4 - From hydraulic unit to front left brake caliper





Markings on hydraulic unit:

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

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

1 - From hydraulic unit to front right brake caliper.

- Marked on hydraulic unit with -VR-.

2 - Hydraulic unit to rear left brake caliper/wheel brake cylinder

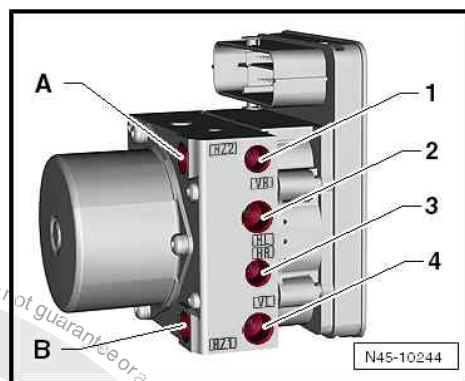
- Marked on hydraulic unit with -HL-.

3 - Hydraulic unit to rear right brake caliper/wheel brake cylinder

- Marked on hydraulic unit with -HR-.

4 - From hydraulic unit to front left brake caliper

- Marked on hydraulic unit with -VL-.





4 Sensors

⇒ ["4.1 Assembly overview - speed sensor on front axle", page 23](#)

⇒ ["4.2 Removing and installing speed sensor on front axle", page 24](#)

⇒ ["4.3 Assembly overview - speed sensor on rear axle", page 24](#)

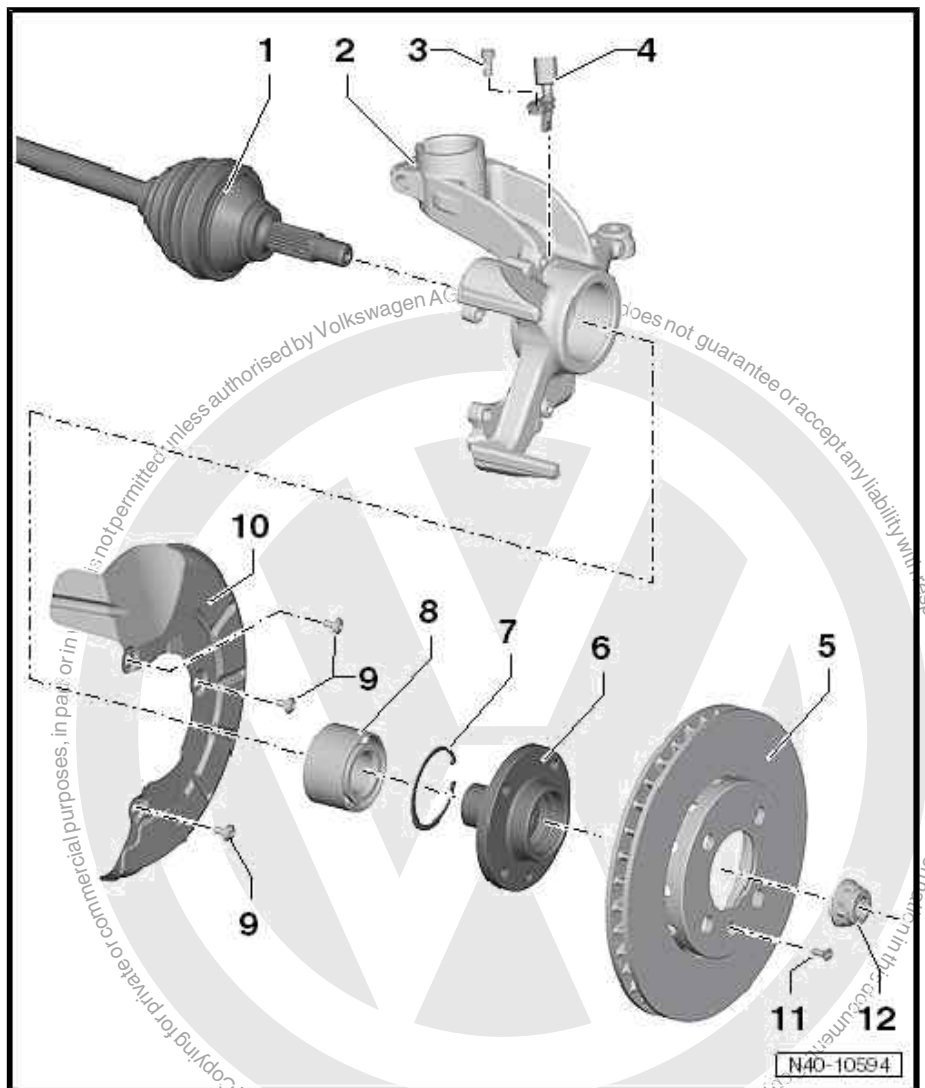
⇒ ["4.4 Removing and installing speed sensor on rear axle", page 26](#)

⇒ ["4.5 Removing and installing steering angle sender G85", page 26](#)

⇒ ["4.6 Removing and installing yaw rate sender and lateral acceleration sender", page 27](#)

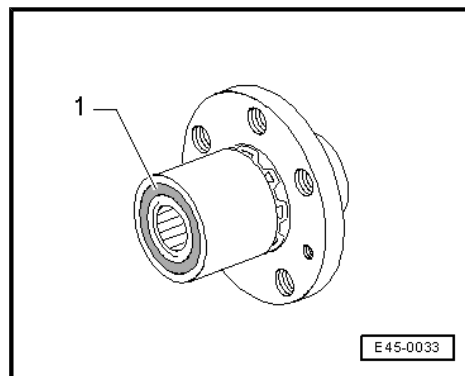
4.1 Assembly overview - speed sensor on front axle

- 1 - Drive shaft
- 2 - Wheel bearing housing
- 3 - Torx bolt
 - 8 Nm
- 4 - Speed sensor
 - Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.
 - Removing and installing
⇒ [page 24](#)
- 5 - Brake disc
- 6 - Wheel hub
- 7 - Retaining ring
- 8 - Wheel bearing
 - ABS sensor ring is installed in wheel bearing
⇒ [page 24](#) .
 - Pressing out and in ⇒ Running gear, axles, steering; Rep. gr. 40 ; Wheel bearing assembly; Renewing wheel bearing assembly .
- 9 - Torx bolts
 - 12 Nm
- 10 - Cover plate
- 11 - Torx bolt
 - 4.5 Nm
- 12 - 12-point nut (self-locking)





ABS sensor ring -1-



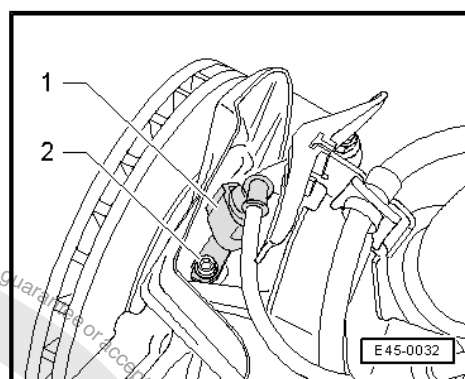
4.2 Removing and installing speed sensor on front axle

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 inner surface of hole and coat speed sensor all around with high-temperature paste G 052 112 A3.
- Insert speed sensor into drilling in wheel bearing housing and tighten bolt.
- Connect speed sensor to speed sensor wire.
- Turn steering to full left and right lock and check clearance to speed sensor wire.



Specified torque:

- ♦ ➔ ["4.1 Assembly overview - speed sensor on front axle", page 23](#)

4.3 Assembly overview - speed sensor on rear axle



1 - Axle beam

2 - Torx bolt

- ☐ 8 Nm

3 - ABS speed sensor

- ☐ Before inserting sensor, clean hole inner surface and coat with high-temperature paste G 052 112 A3.
- ☐ Removing and installing
⇒ [page 26](#)

4 - Brake line

5 - Stub axle

6 - Brake cable

7 - Hexagon bolt

- ☐ Specified torque ⇒ Running gear, axles, steering; Rep. gr. 42 ; Axle beam; Assembly overview - axle beam .

8 - Torx bolt

- ☐ 8 Nm

9 - Brake drum

- ☐ Reset brake before removing brake drum
⇒ [page 42](#) .

10 - Cap

- ☐ Pressing out and in ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview - trailing arm .

11 - 12-point nut (self-locking)

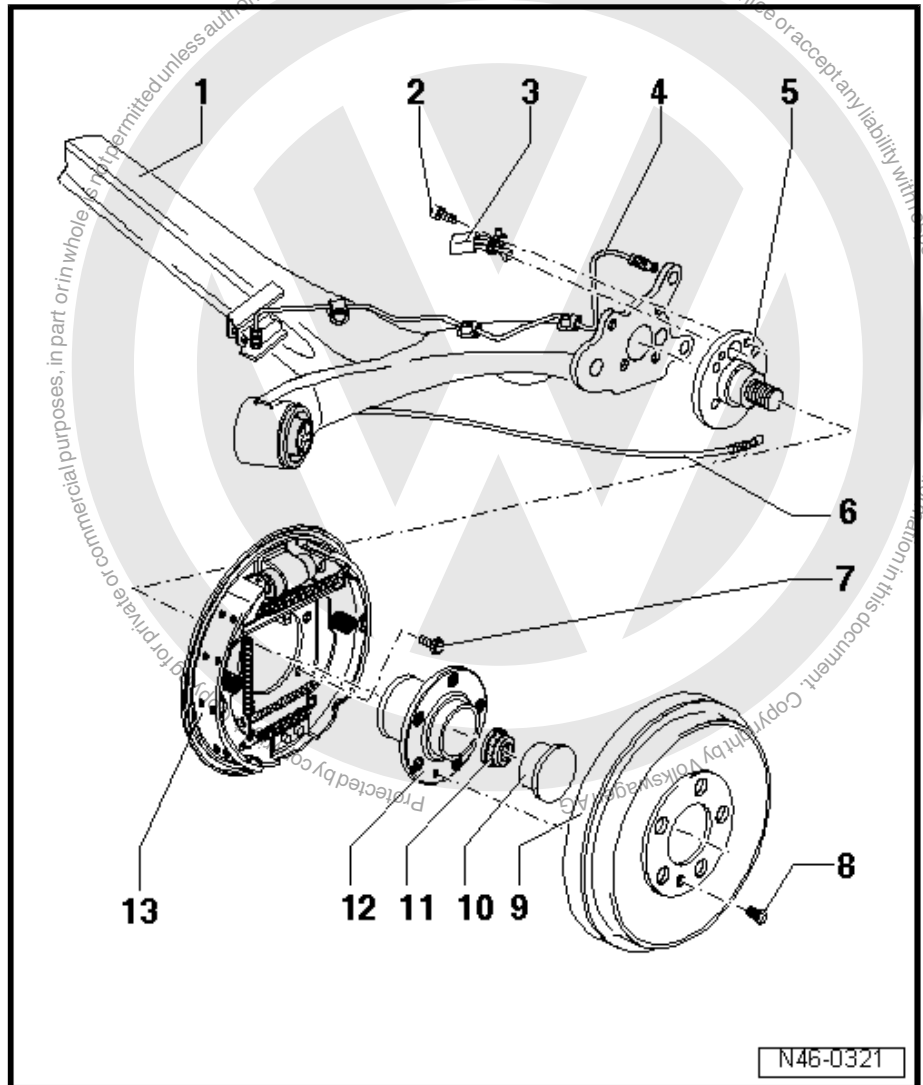
- ☐ Renew after each removal ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview – trailing arm

12 - Wheel hub with wheel bearing

- ☐ ABS sensor ring is installed in wheel bearing ⇒ [page 26](#) .
- ☐ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview - trailing arm .

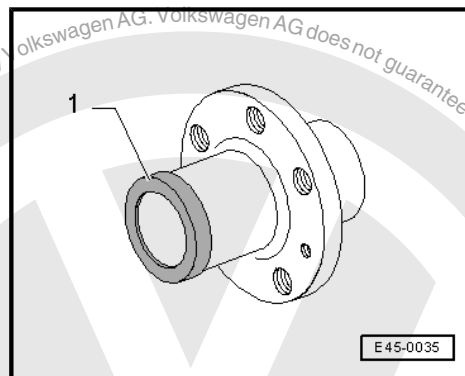
13 - Brake backplate with brake shoes

- ☐ Reset brake before removing brake drum ⇒ [page 42](#)





ABS sensor ring -1-



4.4 Removing and installing speed sensor on rear axle

Removing:

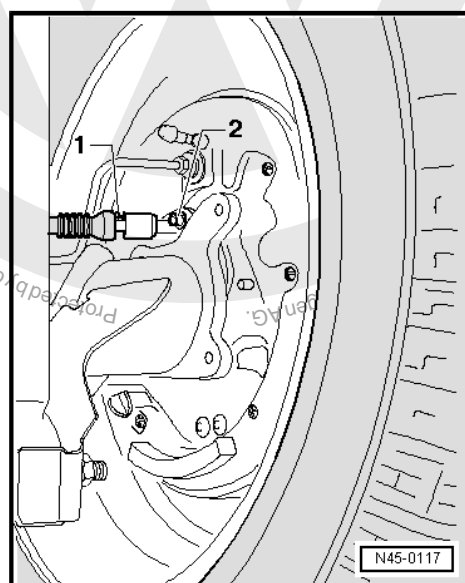
- Raise vehicle.
- Separate connector -1- from speed sensor wire and from speed sensor.
- Remove bolt -2- from stub axle.
- Pull ABS speed sensor out of stub axle.

Installing:

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

Specified torque:

- ♦ ⇒ [“4.3 Assembly overview - speed sensor on rear axle”, page 24](#)



4.5 Removing and installing steering angle sender - G85-

Note different fitting locations depending on which steering column is installed.

For allocation, refer to ⇒ Electronic parts catalogue and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Location: on steering column between steering wheel and steering column switch.

Removing and installing:

⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column switch module

Fitting location: on electric steering column ⇒ Vehicle diagnostic tester and ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column

- Then carry out basic setting of steering angle sender - G85- .



4.6 Removing and installing yaw rate sender and lateral acceleration sender

In this vehicle the lateral acceleration sender - G200- , the yaw rate sender - G202- and the longitudinal acceleration sender - G251- (depending on the equipment fitted) are installed in the control unit.

It is not possible to replace these parts separately.

- Removing and installing ABS control unit - J104- ➔ [page 13](#) .





46 – Brakes - mechanism

1 Front brake

⇒ [“1.1 Assembly overview - front brake”, page 28](#)

⇒ [“1.2 Removing and installing brake pads”, page 31](#)

⇒ [“1.3 Removing and installing brake caliper”, page 36](#)

1.1 Assembly overview - front brake

⇒ [“1.1.1 Assembly overview - FS III front brake”, page 28](#)

⇒ [“1.1.2 Assembly overview - front brake PC57”, page 30](#)

1.1.1 Assembly overview - FS III front brake



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- 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 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 36](#)
- ☐ Repairing ⇒ [page 57](#)

2 - Dust cap

- ☐ Fit onto bleeder valve

3 - Bleeder valve

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

4 - Banjo bolt

- ☐ Captive, with seals
- ☐ 35 Nm

5 - Brake hose with banjo union and banjo bolt

- ☐ Ensure correct installation position

6 - Suspension strut

7 - Retaining clip

8 - Bracket

9 - Brake line

- ☐ 14 Nm

10 - Cap

- ☐ Qty. 2

11 - Guide pin

- ☐ Qty. 2
- ☐ 30 Nm

12 - Wheel bearing housing

- ☐ With integrated brake carrier.
- ☐ Lightly grease guide surfaces with lithium grease - G 052 150 A2- .

13 - Cover plate

14 - Torx bolts

- ☐ 12 Nm

15 - Brake disc

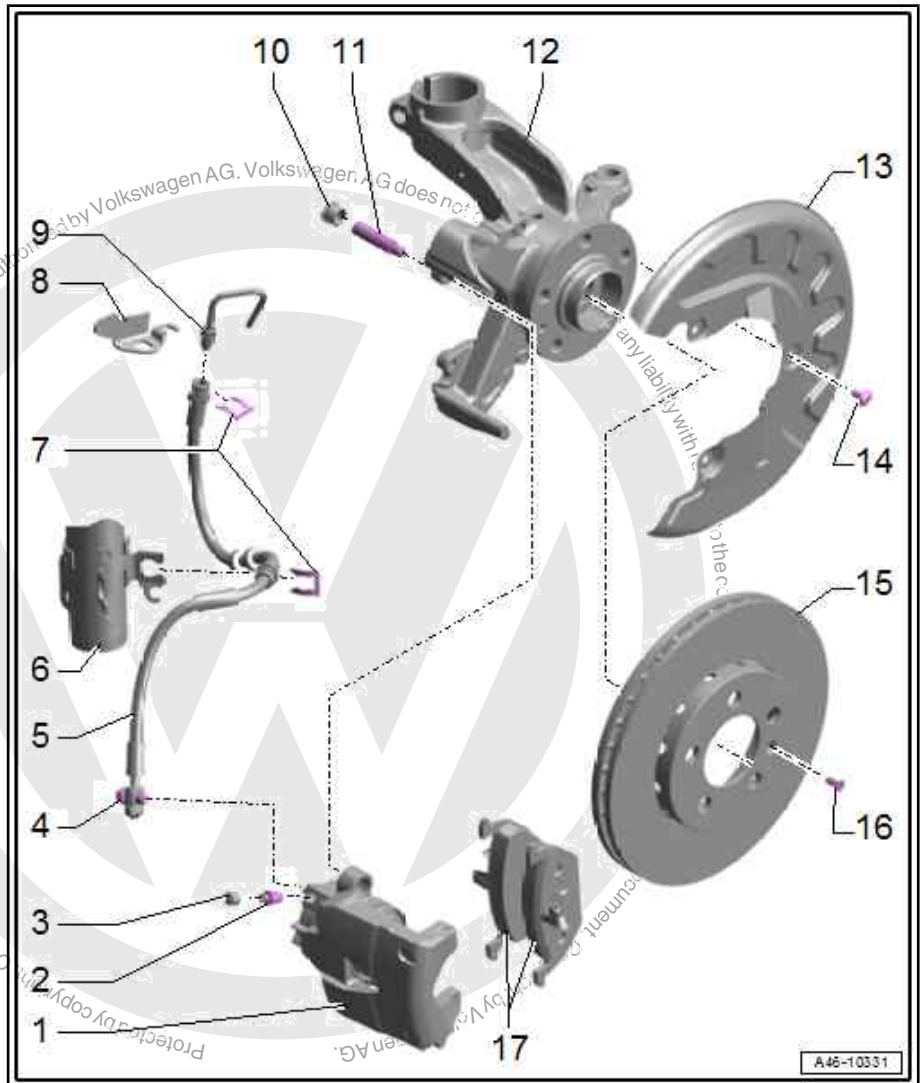
- ☐ Internally ventilated
- ☐ Wear limits ⇒ [page 3](#)
- ☐ Always renew on both sides of an axle.
- ☐ Remove brake caliper prior to removing.
- ☐ Never remove brake discs from wheel hub by force. If necessary use penetrating fluid, because otherwise brake discs can be damaged.

16 - Torx bolt

- ☐ 8 Nm

17 - Brake pads

- ☐ Wear limit: 2 mm excluding backing plate.





- ☐ Check thickness ⇒ Maintenance ; Booklet ; Front and rear brake pads/linings: Checking thickness
- ☐ Always renew on both sides of an axle.
- ☐ Removing and installing ⇒ [page 31](#)

1.1.2 Assembly overview - front brake PC57



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- 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 - Cover plate

2 - Torx bolt

- ☐ 12 Nm

3 - Brake disc

- ☐ Internally ventilated
- ☐ Wear limits ⇒ [page 3](#)
- ☐ Always renew on both sides of an axle.
- ☐ Remove brake caliper and brake carrier prior to removing.
- ☐ Never remove brake discs from wheel hub by force. If necessary use penetrating fluid, because otherwise brake discs can be damaged.

4 - Torx bolt

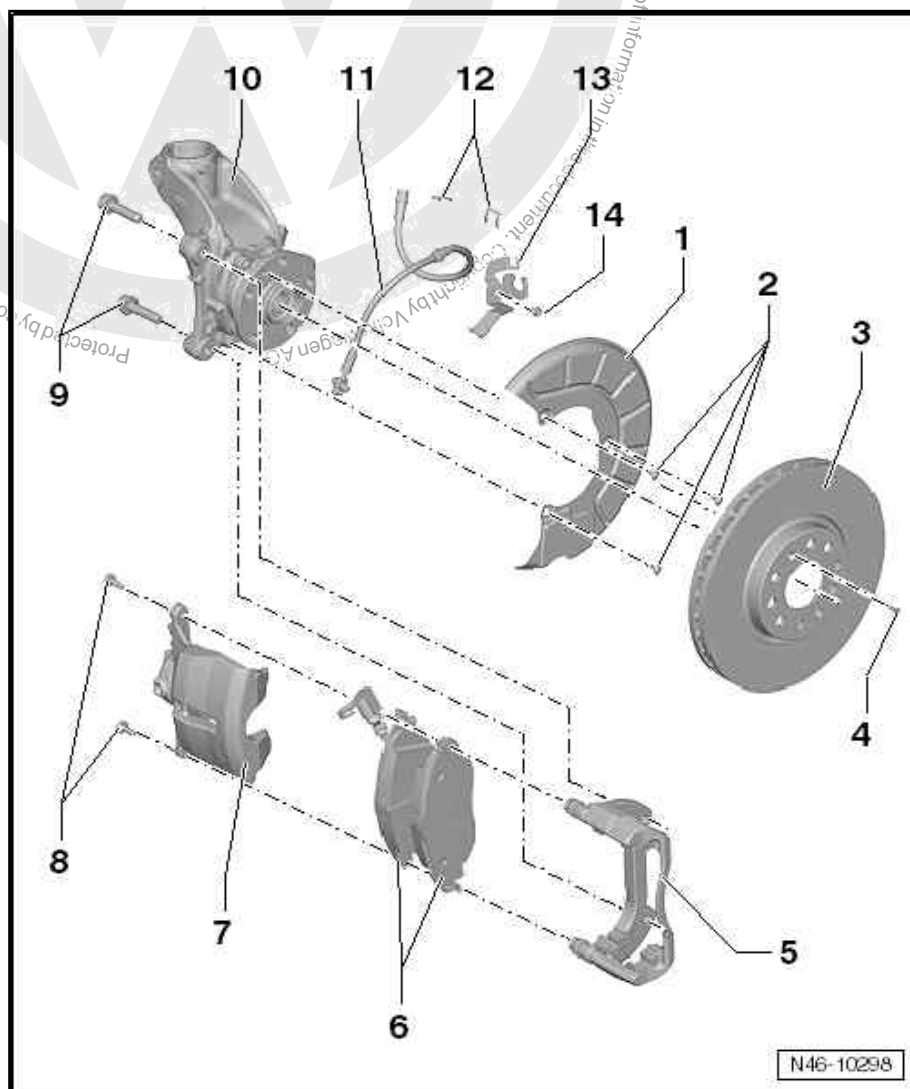
- ☐ 8 Nm

5 - Brake carrier

- ☐ Apply thin coat of lithium grease G 052150 A2 to brake pad guide surfaces.

6 - Brake pads

- ☐ With front right brake pad wear indicator
- ☐ When wear reaches a predetermined limit (approx. 4 mm), the warning lamp in the dash panel insert comes on. Sensors can be renewed individually.
- ☐ Wear limit: 2 mm excluding backing plate.
- ☐ Check thickness ⇒ Maintenance ; Booklet ; Checking condition of discs and thickness of pads at front and rear





- ☐ Always renew on both sides of an axle.
- ☐ Removing and installing ⇒ [page 33](#)

7 - Brake caliper

- ☐ Do not disconnect brake hose when changing pads.
- ☐ Removing and installing ⇒ [page 38](#)
- ☐ Repairing

Allocation ⇒ Electronic parts catalogue (ETKA)

8 - Hexagon bolt (self-locking)

- ☐ Renew after removal
- ☐ 35 Nm

9 - Ribbed bolt

- ☐ Clean if reusing.
- ☐ 200 Nm

10 - Wheel bearing housing

- ☐ With bolted brake carrier

Allocation ⇒ Electronic parts catalogue (ETKA)

11 - Brake hose with banjo union and banjo bolt

- ☐ Ensure correct installation position
- ☐ 35 Nm

12 - Retaining clip

13 - Bracket

14 - Bolt

- ☐ 8 Nm

1.2 Removing and installing brake pads

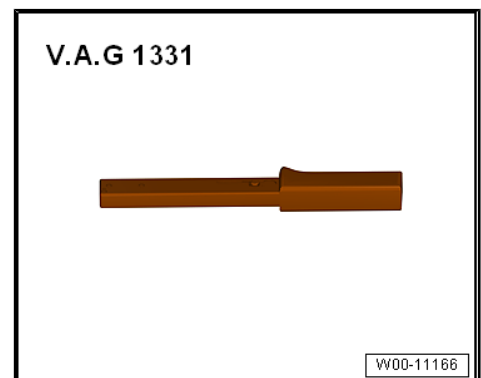
⇒ ["1.2.1 Removing and installing brake pads, FS III front brake", page 31](#)

⇒ ["1.2.2 Removing and installing brake pads, front brakes PC57", page 33](#)

1.2.1 Removing and installing brake pads, FS III front brake

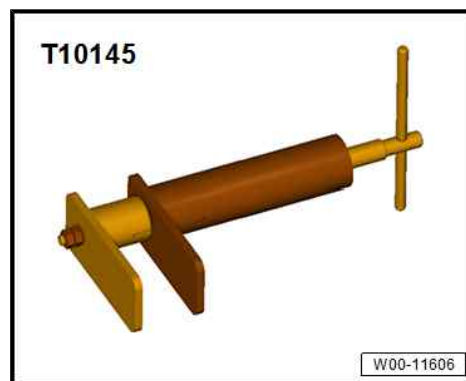
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-





◆ Piston resetting appliance - T10145-



◆ Lithium grease - G 052150 A2-

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

Cleaning:

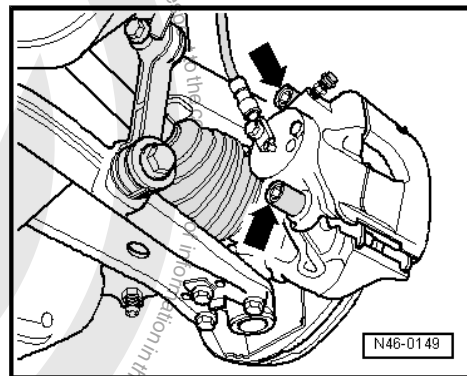


WARNING

Health hazard due to poisonous dust from brake system.

Risk of irreversibly deposited dust particles in the lungs. Risk of respiratory health problems.

- **Never blow out the brake system with compressed air.**



- Thoroughly clean contact surfaces for brake pads on brake carrier and remove any corrosion.
- Clean brake caliper.



Note

Use only methylated spirits for cleaning the brake caliper housing.

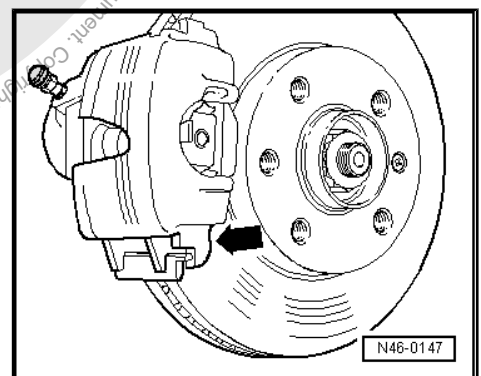
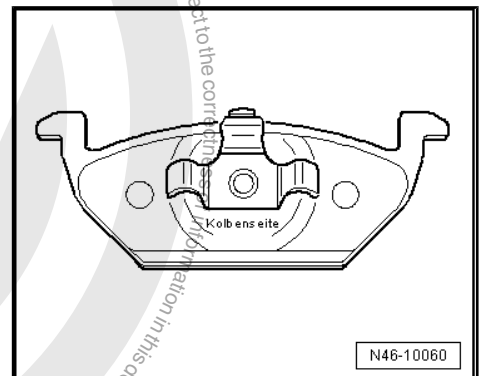
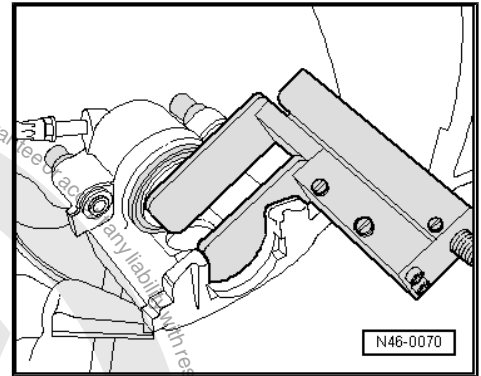
Installing

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

- Lightly grease guide surface on brake carrier with lithium grease - G 052150 A2- .



- Press piston back.
- Insert brake pads into brake caliper and piston.
- Insert brake pad with “piston side” written on backing plate into brake piston.
- Install brake caliper with brake pads on wheel bearing housing.
- First position brake caliper at bottom -arrow- of brake carrier.
- Brake caliper stud must be positioned behind brake carrier guide!
- Bolt brake caliper to brake carrier with both guide pins.
- Fit both protective caps.
- Install wheels.



Note

- ◆ *Every time after changing pads, depress brake pedal firmly several times with vehicle stationary, so that brake pads are properly seated in their normal operating position.*
- ◆ *After changing brake pads, check brake fluid level.*
- ◆ *Ensure that brakes work properly before the vehicle is driven.*

Specified torques

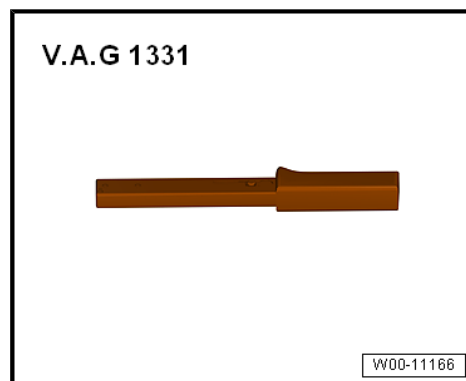
- ◆ ⇒ [“1.1.1 Assembly overview - FS III front brake”, page 28](#)
- ◆ Wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ;
Wheels, tyres; Specified torque for wheel bolts .

1.2.2 Removing and installing brake pads, front brakes PC57

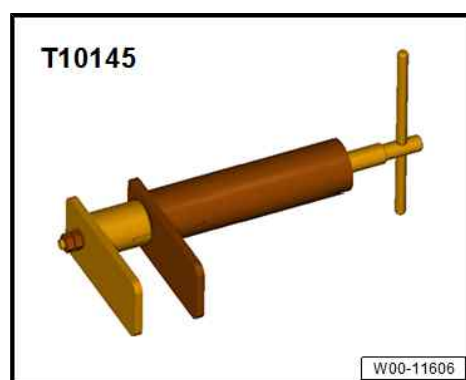
Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-



- ◆ Piston resetting appliance - T 10145-



Removing



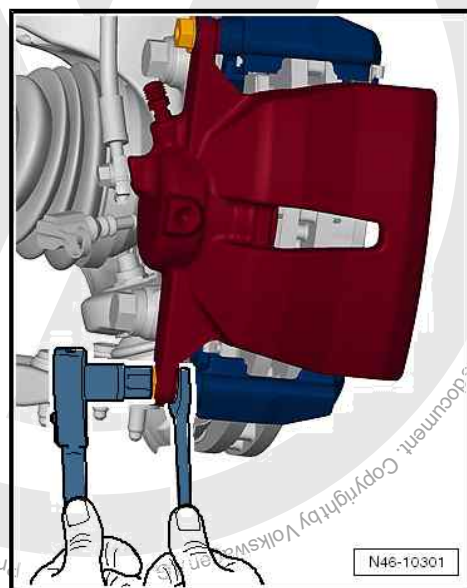
Note

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 for brake pad wear indicator.

The brake pad wear indicator is installed on front right.

- Unscrew both securing bolts from brake caliper, counter holding on guide pin.





- Remove brake caliper -1- and secure with wire so that weight of brake caliper does not strain or damage brake hose.
- Remove brake pads -2 and 3- from brake carrier -4-.

Cleaning:

WARNING

Health hazard due to poisonous dust from brake system.
Risk of irreversibly deposited dust particles in the lungs. Risk of respiratory health problems.

- Never blow out the brake system with compressed air.

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



Note

Use only methylated spirits for cleaning the brake caliper housing.

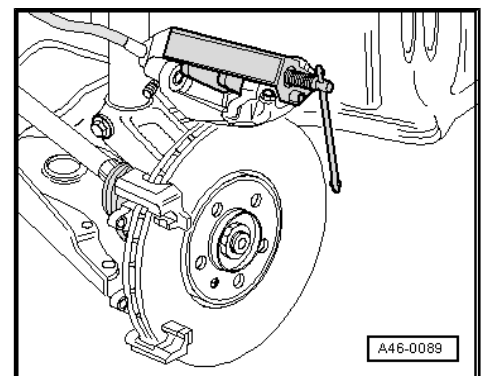
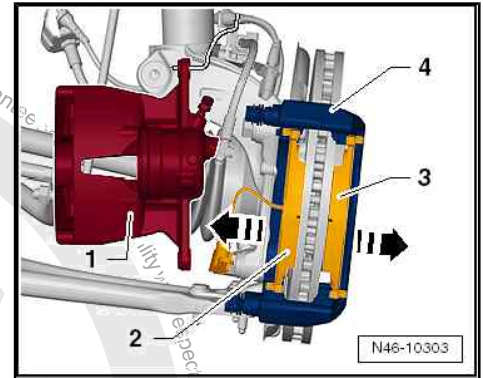
Installing



Note

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.
- Apply a thin coat of lithium grease G 052150 A2 to brake pad guide surfaces on brake carrier.



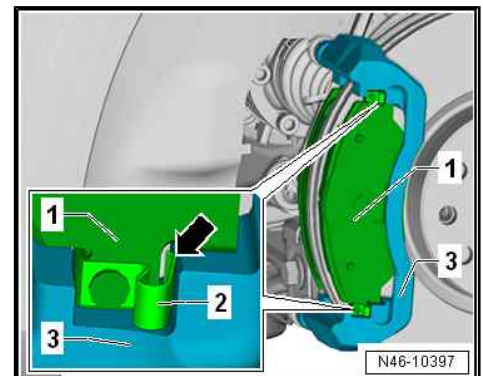
- Place brake pads -1- together with retaining springs -2- in recess of brake carrier -3-.



Note

After fitting brake pads, check that all retaining springs -2- are properly seated -arrow-.

- Carefully place brake caliper on brake carrier.





- Secure brake caliper to brake carrier with new self-locking bolts, counter holding on guide pin.
- Connect brake pad wear indicator connector.
- Install wheels.

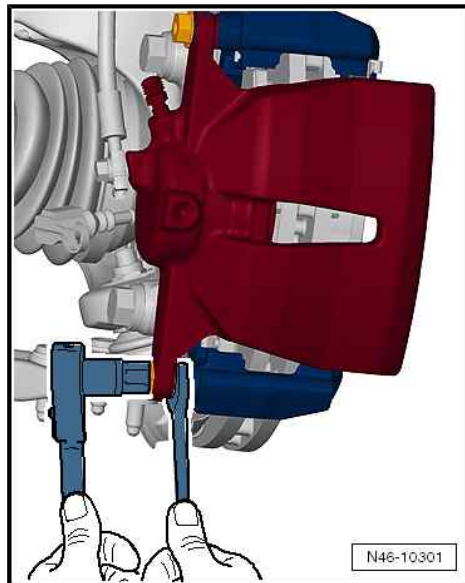
Specified torques

- ♦ ⇒ [“1.1.2 Assembly overview - front brake PC57”, page 30](#)
- ♦ Wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torque for 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.*
- ♦ *After changing brake pads, check brake fluid level.*
- ♦ *Ensure that brakes work properly before the vehicle is driven.*



1.3 Removing and installing brake caliper

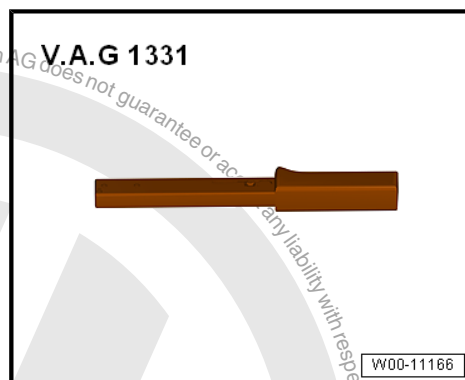
⇒ [“1.3.1 Removing and installing brake caliper, FS III brake caliper”, page 36](#)

⇒ [“1.3.2 Removing and installing brake caliper, front brakes PC57”, page 38](#)

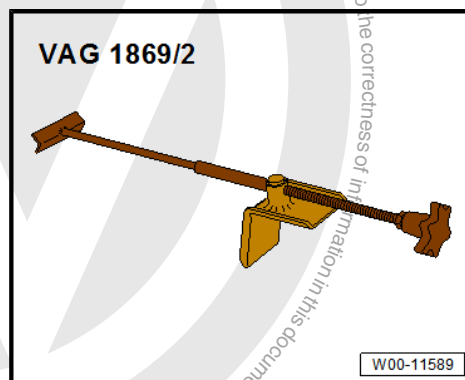
1.3.1 Removing and installing brake caliper, FS III brake caliper

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



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





Removing



Note

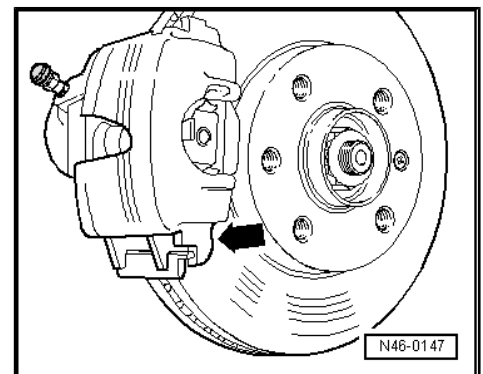
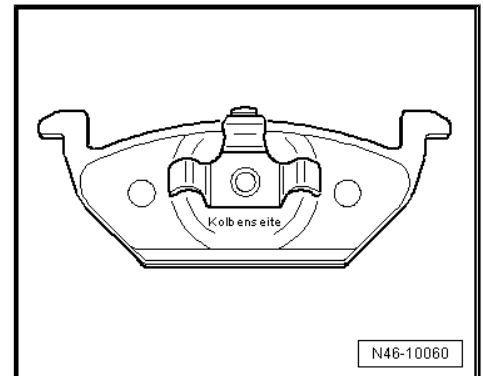
This procedure is only relevant when replacing or repairing the brake caliper.

- Remove wheels.
- Connect bleed bottle bleeder hose -1- to bleeder valve of brake caliper.
- Open bleeder valve.
- Apply brake pedal depressor - V.A.G 1869/2- .
- Close bleed valve and remove bleed bottle.
- Unscrew brake hose.
- Pull both cover caps out of brake caliper bearing bushes.
- Loosen both guide pins and remove from brake caliper.
- Pull brake caliper off brake carrier.
- Take brake pads out of brake caliper.

Installing

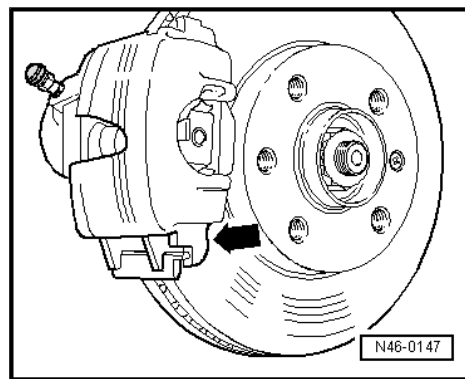
- The piston is pressed back.
 - Insert brake pads into brake caliper and piston.
- Insert brake pad with "piston side" written on backing plate into brake piston.

- Install brake caliper with brake pads on wheel bearing housing.





- 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 protective caps.
- Screw brake hose onto brake caliper.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system ➔ [page 94](#) .
- Install wheels.



Note

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

Specified torques

- ◆ ➔ ["1.1.1 Assembly overview - FS III front brake", page 28](#)
- ◆ Wheel bolts ➔ Running gear, axles, steering; Rep. gr. 44 ;
Wheels, tyres; Specified torque for wheel bolts .

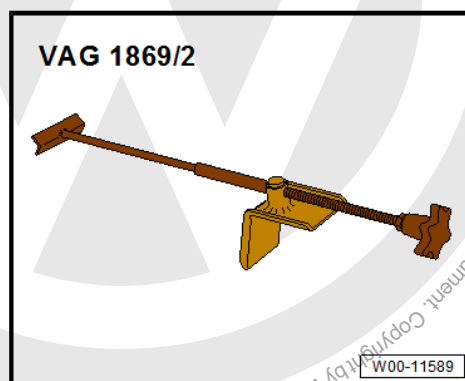
1.3.2 Removing and installing brake caliper, front brakes PC57

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



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



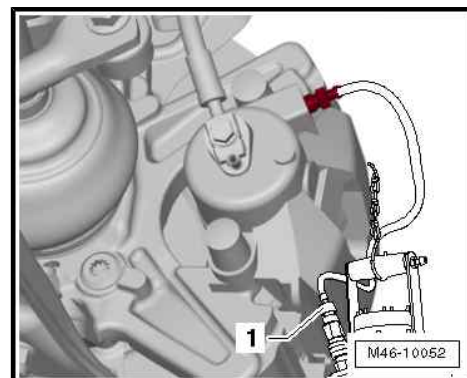


Note

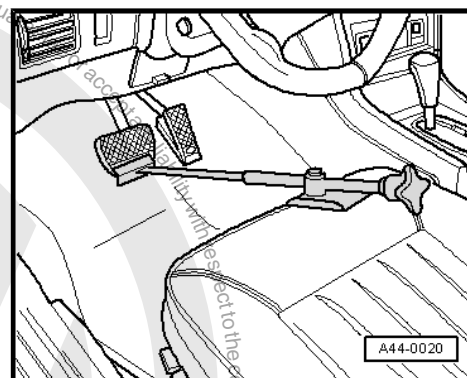
This procedure is only relevant when replacing or repairing the brake caliper.

Removing

- Remove wheels.
- Disconnect connector for brake pad wear indicator.
- Connect bleed bottle bleeder hose -1- to bleeder valve of brake caliper.
- Open bleeder valve.



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

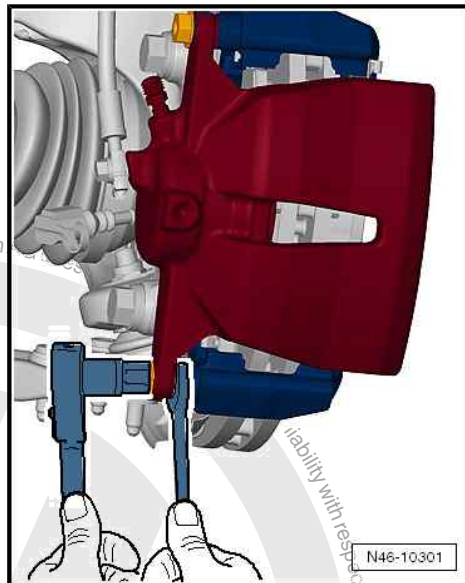




- Unscrew both securing bolts from brake caliper, counter holding on guide pin.
- Pull brake caliper off brake carrier.

Installing

- The piston is pressed back.
- The two brake pads are seated in the retaining springs on the brake carrier.
- Carefully place brake caliper on brake carrier.
- Secure brake caliper to brake carrier with new self-locking bolts, counter holding on guide pin.
- Screw brake hose onto brake caliper.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Connect brake pad wear indicator connector.
- Bleed brake system ➔ [page 94](#) .
- Install wheels.



Specified torques

- ◆ ➔ [“1.1.2 Assembly overview - front brake PC57”, page 30](#)
- ◆ Bleed valve
➔ [“1.1 Assembly overview – front brake caliper”, page 57](#)
- ◆ Wheel bolts ➔ Running gear, axles, steering; Rep. gr. 44 ;
Wheels, tyres; Specified torque for 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.*
- ◆ *Ensure that brakes work properly before the vehicle is driven.*



2 Rear brake

⇒ "2.1 Assembly overview - rear brakes", page 41

⇒ "2.2 Resetting drum brakes", page 42

⇒ "2.3 Removing and installing brake shoes", page 42

2.1 Assembly overview - rear brakes



Note

- ◆ After renewing wheel brake cylinder, brake backplate and brake shoes, depress brake pedal firmly several times with vehicle stationary so that the brake shoes are properly seated in their normal operating position.
- ◆ Use the brake filling and bleeding equipment - VAS 5234- to draw off brake fluid from the brake fluid reservoir.
- ◆ Before removing a wheel brake cylinder or brake backplate or disconnecting a brake line from the wheel brake cylinder, fit brake pedal depressor - V.A.G 1869/2- (release pressure in system).

1 - Axle beam

2 - Torx bolt

- 8 Nm

3 - ABS speed sensor

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

4 - Brake line

- 14 Nm

5 - Stub axle

6 - Brake cable

- Adjusting parking brake
⇒ page 50

7 - Hexagon bolt

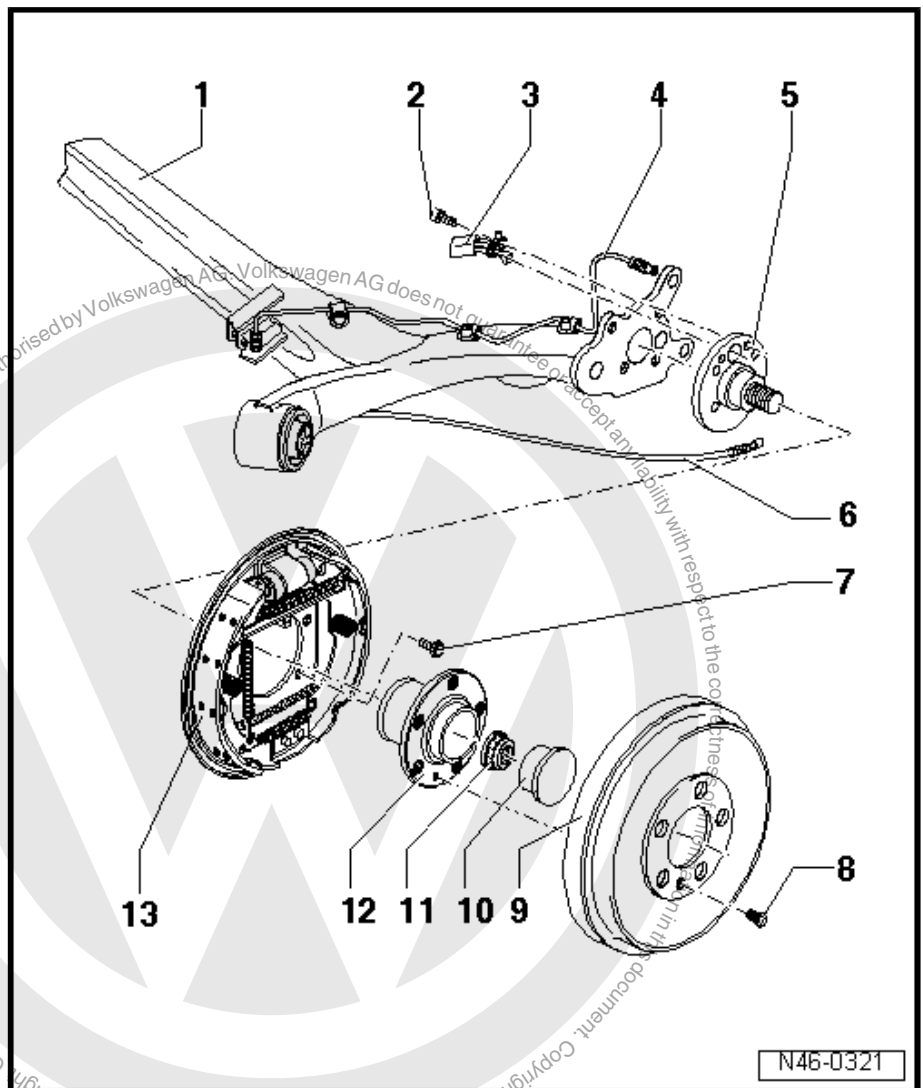
- Specified torque ⇒ Running gear, axles, steering; Rep. gr. 42 ; Axle beam; Assembly overview - axle beam .

8 - Torx bolt

- 8 Nm

9 - Brake drum

- Wear limits ⇒ page 4
- Reset brake before removing brake drum
⇒ page 42 .
- Clean carefully and check for wear, damage, dimensional accu-





racy and flawless brake surface.

10 - Cap

- ❑ Pressing out and in ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview - trailing arm .

11 - 12-point nut (self-locking)

- ❑ Renew after each removal ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview – trailing arm

12 - Wheel hub with wheel bearing

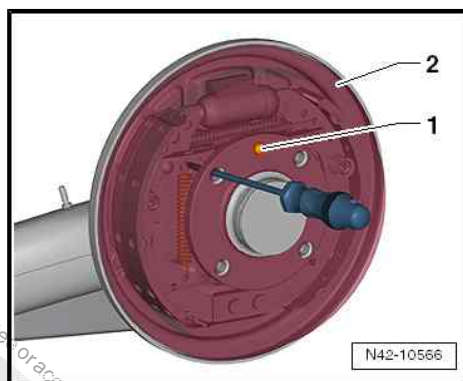
- ❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview - trailing arm .

13 - Brake backplate with brake shoes

- ❑ Minimal thickness of brake lining: 2.5 mm.
- ❑ Check thickness ⇒ Maintenance ; Booklet ; Front and rear brake discs and pads/linings: Checking condition of discs and thickness of pads/linings
- ❑ Reset brake before removing brake drum ⇒ [page 42](#) .

2.2 Resetting drum brakes

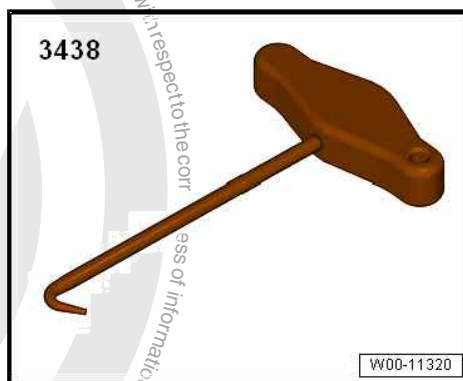
- Insert a screwdriver through a wheel bolt threaded hole in the brake drum and push the wedge upwards.



2.3 Removing and installing brake shoes

Special tools and workshop equipment required

- ◆ Hook - 3438-



After working on rear wheel brakes:

- ◆ Release parking brake.
- ◆ Firmly depress brake pedal once.

Assembly overview - brake shoes:



1 - Spring plate

- ☐ To remove, push against compression spring and turn by 90°.

2 - Compression spring

3 - Brake shoe with lever for parking brake

- ☐ Removing and installing ⇒ [page 42](#)
- ☐ Adjusting parking brake ⇒ [page 50](#)

4 - Upper return spring

- ☐ Detach with hook - 3438- .

5 - Lower return spring

- ☐ Grease contact surface with lubricating paste, part No. G 000 650.

6 - Extension spring

7 - Brake shoe

Brake linings can also be supplied without brake shoes.

8 - Cap

- ☐ Remove to check brake lining thickness.

9 - Roll pin

10 - Brake carrier

11 - Torx bolt

- ☐ 8 Nm

12 - Wheel brake cylinder

- ☐ Figure with breather valve ⇒ [page 44](#)
- ☐ Check for leaks ⇒ [page 97](#)

13 - Wedge

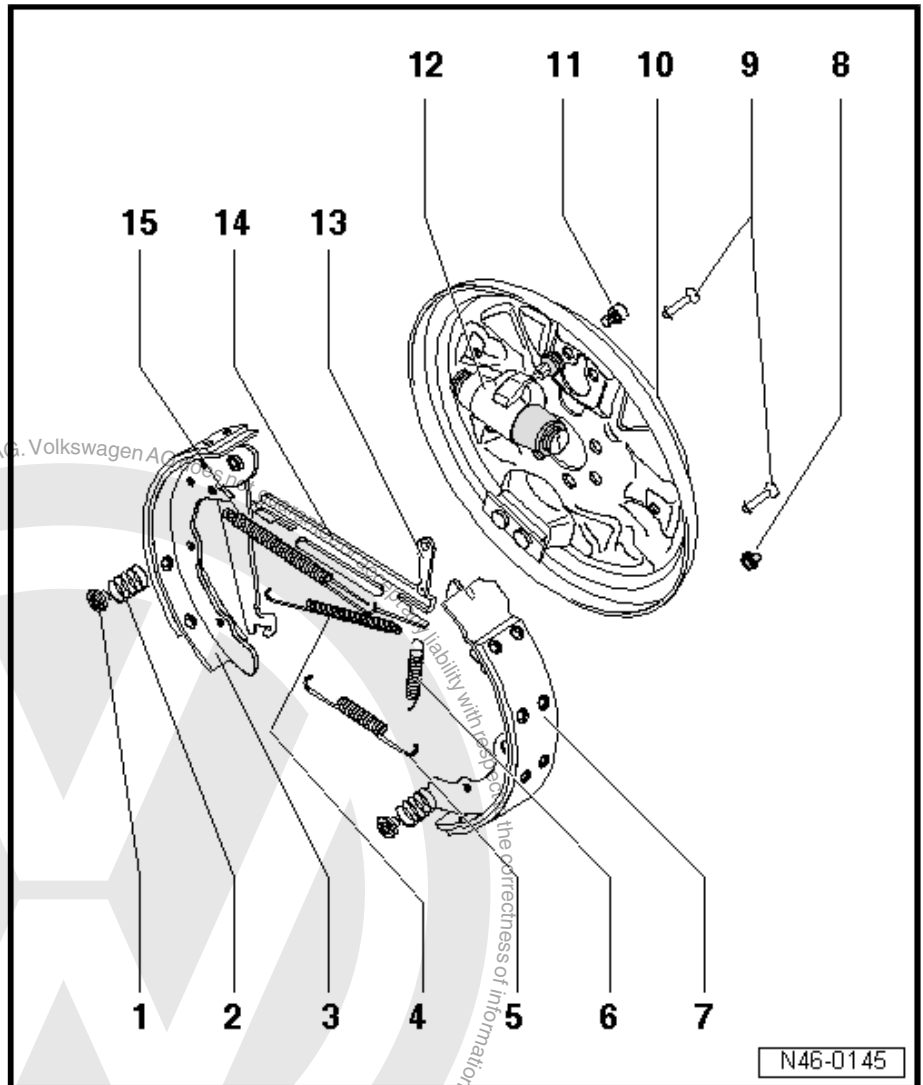
- ☐ To remove and install the brake drum, push wedge upwards through a wheel bolt hole ⇒ [page 42](#) .

14 - Push bar

- ☐ Grease contact surface with lubricating paste, part No. G 000 650.

15 - Locating spring

- ☐ Detach with hook - 3438- .



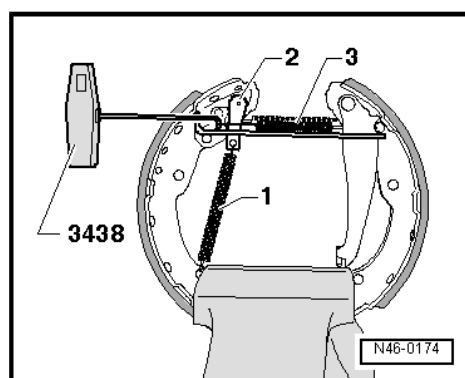
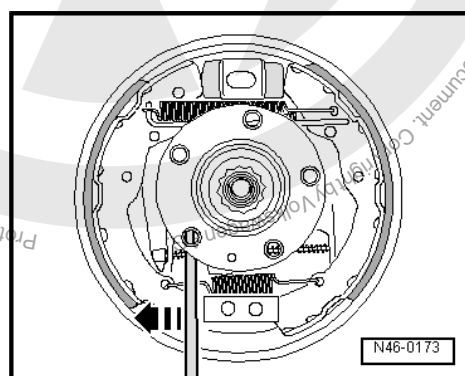
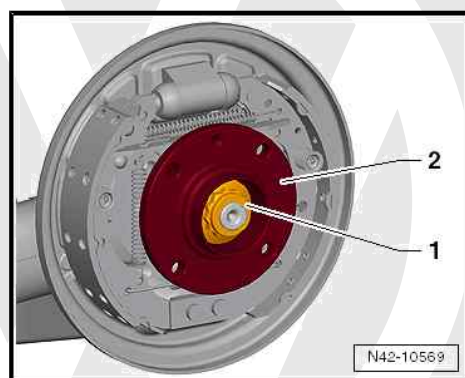
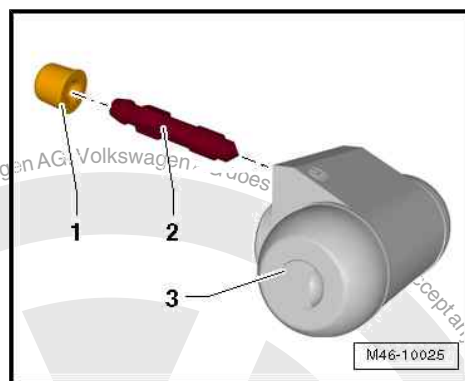


Wheel brake cylinder

- 1 - Dust cap
- 2 - Bleed valve, 5 Nm
- 3 - Wheel brake cylinder

Removing:

- Remove wheels.
- Remove drum brake. Reset brake prior to removal
⇒ [page 42](#) .
- Remove wheel hub -2- ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Removing and installing wheel bearing unit .
- Remove spring plate with spring.
- Lever out brake shoes in direction of arrow with aid of a screw-driver behind support plate.
- Place brake shoe down on lower support plate.
- Unhook lower return spring.
- Detach brake cable.
- Remove brake shoes.
- Clamp brake shoes in vice.
- Remove spring -1- for wedge -2-.
- Remove upper return spring -3- with hook - 3438- .





- Detach locating spring -1- using hook - 3438- .
- Take push rod -2- and wedge -3- off brake shoe.

Cleaning:

! WARNING

Health hazard due to poisonous dust from brake system.
Risk of irreversibly deposited dust particles in the lungs. Risk of respiratory health problems.

- Never blow out the brake system with compressed air.

Use only methylated spirits for cleaning the brake system.

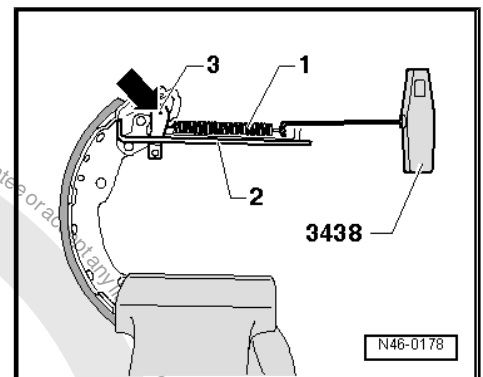
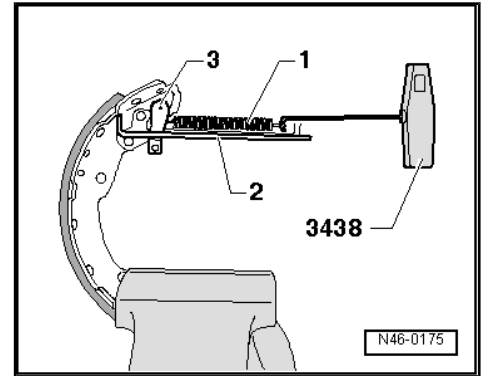
Installing:

- Attach locating spring -1- to push bar -2- using hook - 3438- .
- Insert wedge -3- at same time.

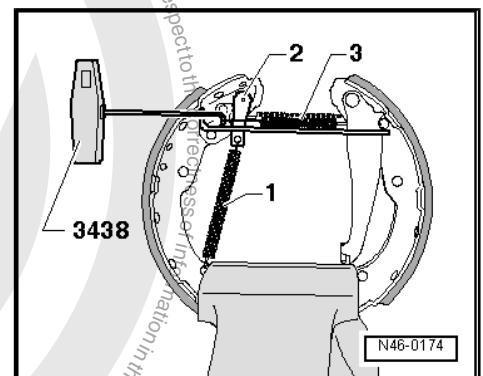
Installation position:

Raised portion -arrow- must remain visible when installing.

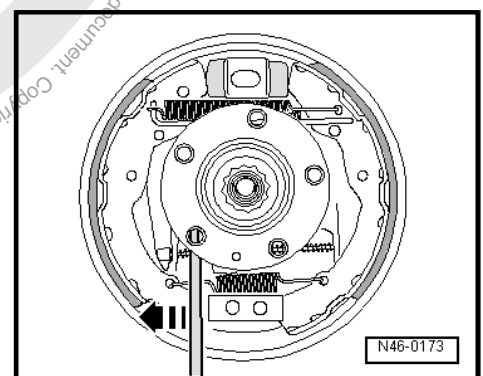
- Insert brake shoe with brake lever in push rod.



- Attach return spring -3- using hook - 3438- .
- Attach spring -1- for wedge -2-.
- Fit brake shoes to brake carrier.
- Attach brake cable to brake lever.
- Fit brake shoes onto wheel cylinder pistons.



- Fit lower return spring and lift brake shoes behind lower support.
- Fit spring and spring plate.
- Install wheel hub -2- ➔ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Removing and installing wheel bearing unit .
- Install brake drum.
- Install wheels.
- Firmly depress brake pedal once.
- Adjusting parking brake ➔ [page 50](#) .



Specified torques:

- ◆ ➔ ["2.1 Assembly overview - rear brakes", page 41](#)
- ◆ Wheel bolts ➔ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts .



3 Parking brake

⇒ "3.1 Assembly overview - parking brake", page 46

⇒ "3.2 Removing and installing rear brake cable", page 47

⇒ "3.3 Adjusting parking brake", page 50

3.1 Assembly overview - parking brake

1 - Push-button

- ☐ Pulling off ⇒ [page 47](#)
- ☐ Will be destroyed when pulling off; must be renewed
- ☐ Push onto parking brake lever push rod and ensure both locking lugs are engaged by pulling slightly.

2 - Handbrake lever trim

- ☐ To remove, first pull off push button ⇒ [page 47](#)
- ☐ Lever up release tab in rear lower area of handle with a screwdriver.
- ☐ Then pull off forwards.

3 - Adjustment nut

- ☐ Adjusting parking brake ⇒ [page 50](#)

4 - Compensator

5 - Handbrake lever

- ☐ Before removing, remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Assembly overview - parking brake lever trim .

6 - Hexagon nut

- ☐ 23 Nm

7 - Parking brake switch - F321-

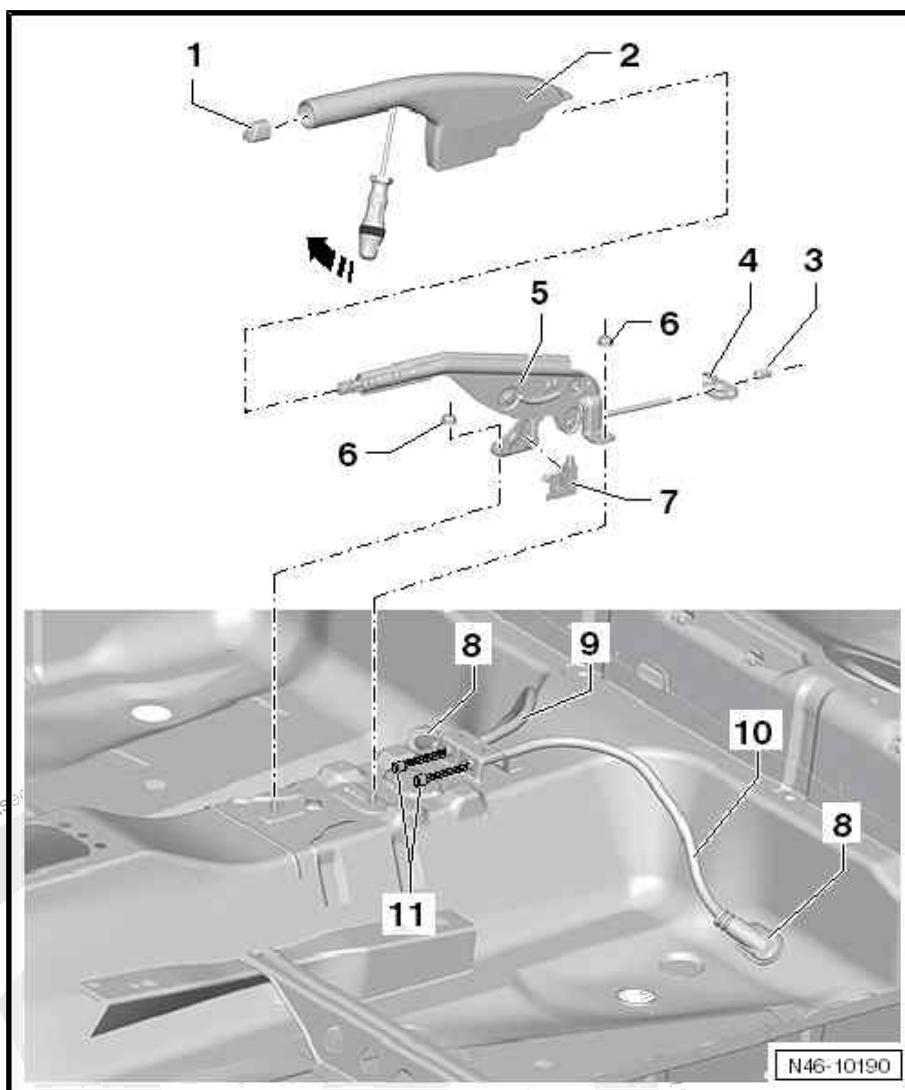
8 - Rubber grommet

9 - Right guide tube

10 - Left guide tube

11 - Brake cables

- ☐ Removing and installing ⇒ [page 47](#)



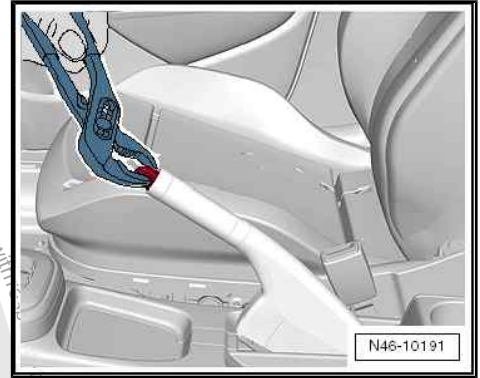


Removing push button



Note

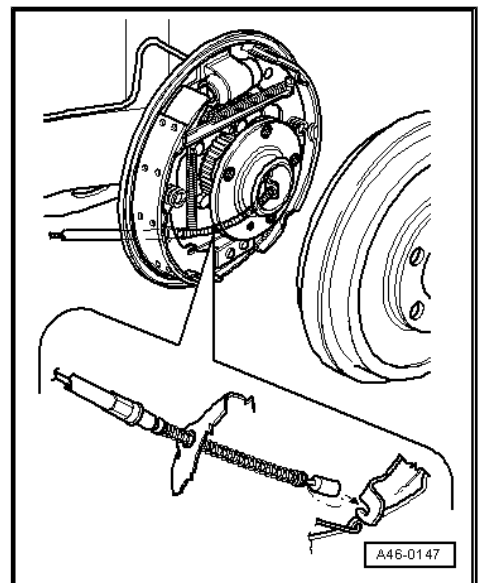
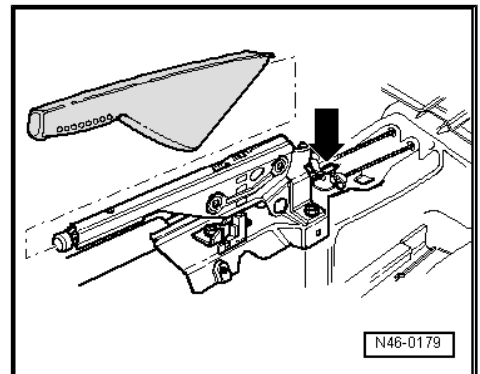
Will be destroyed when removing; must be renewed.



3.2 Removing and installing rear brake cable

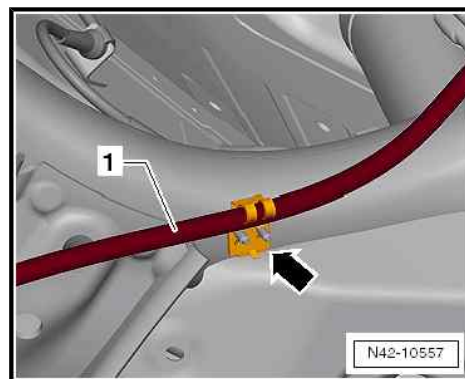
Removing:

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - parking brake lever trim .
- Release parking brake.
- Loosen adjustment nut -arrow- until brake cable can be unhooked from compensator.
- Raise vehicle.
- Remove wheel.
- Remove drum brake. Reset brake prior to removal
⇒ [page 42](#) .
- Unhook brake cable from parking brake lever.
- Pull brake cable out of brake carrier.

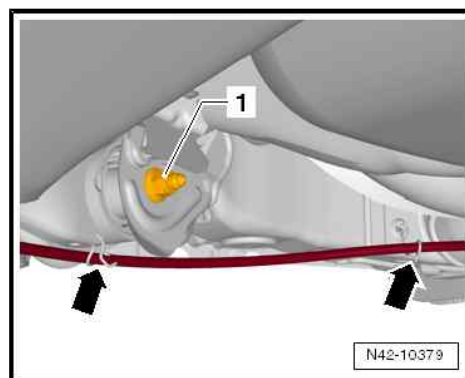




- Clip brake cable -1- out of retainer on rear axle beam -arrow-.

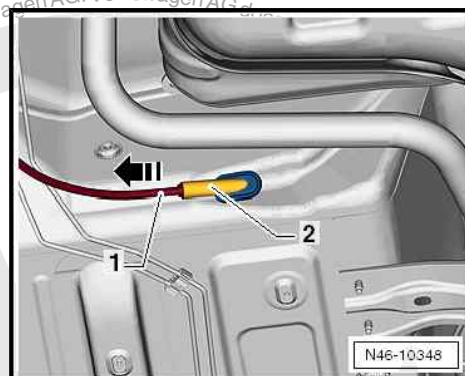


- Unhook brake cable from retainers -arrows-.

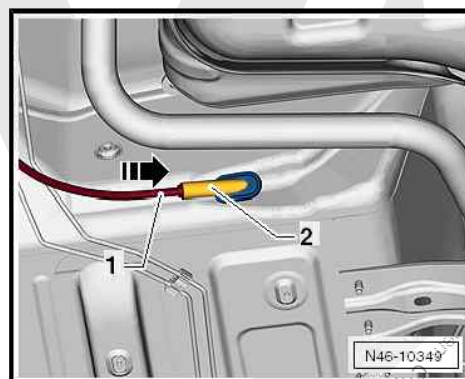


- Pull brake cable -1- in direction of arrow out of guide tube -2-.

Installing:

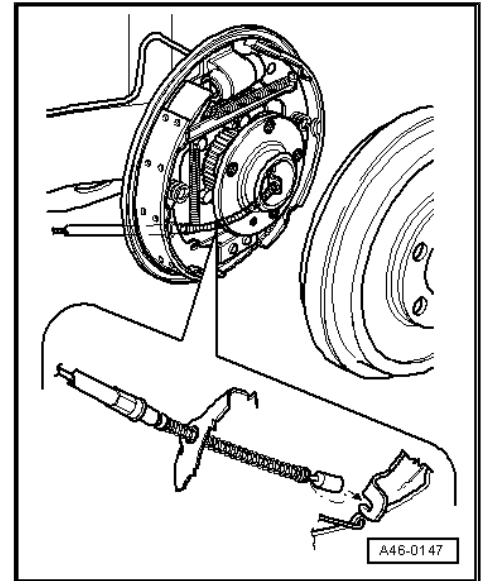


- Fit brake cable -1- in direction of arrow into guide tube -2-.
- Insert brake cable into brake carrier.

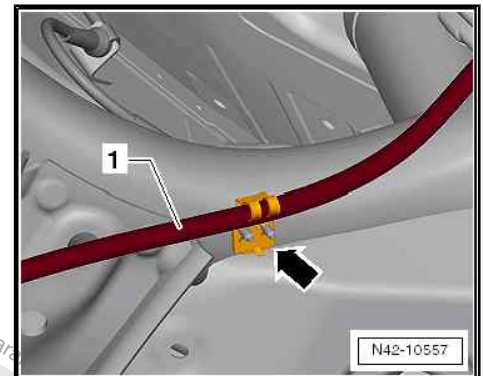




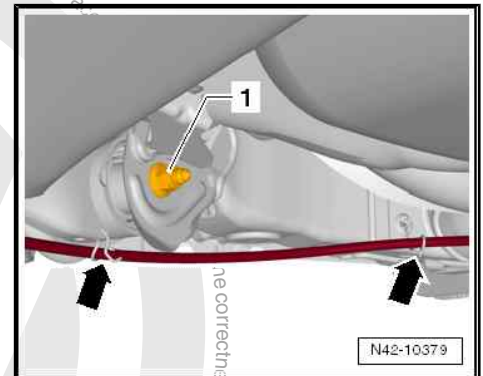
- Attach parking brake cable to parking brake lever.
- Install brake drum.



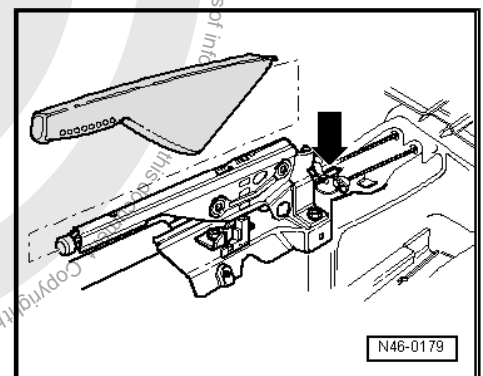
- Clip brake cable -1- into retainer on rear axle beam -arrow-.
- Brake cable clamping ring must lie in the middle of the clip.



- Hook brake cable into retainers -arrows-.
- Fit brake cable through guide tube.
- Hook brake cable into compensator.



- Pretension brake cable with adjustment nut -arrow-.
- Install wheels.
- Adjusting parking brake ➤ [page 50](#) .
- Install centre console ➤ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - parking brake lever trim



Specified torque:

Wheel bolts ➤ Running gear, axles, steering; Rep. gr. 44 ;
Wheels, tyres; Specified torque for wheel bolts .



3.3 Adjusting parking brake

A new adjustment is only necessary when the brake cables, brake carrier or brake pads are renewed.

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - parking brake lever trim .
- Foot brake must be functional and bled.
- Parking brake lever is in normal position (released).
- Loosen brake cables by means of adjustment nut -arrow A-.
- Firmly depress brake pedal three times.
- Pretension brake cable with adjustment nut -arrow A- just until parking brake lever returns to normal position on its own (see note below).



Note

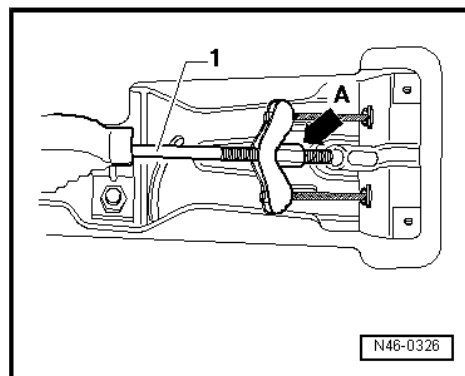
Pull parking brake lever from normal position to right before it engages in first tooth. Then, release handbrake lever. The parking brake lever must return to normal position on its own.

- Pull handbrake lever over 2 notches.
- Tighten adjustment nut -arrow A- until both wheels cannot be turned by hand.

Adjustment nut -arrow A- must be screwed over end of pull rod -1-.

- Release parking brake and check that both wheels turn freely. If required turn adjustment nuts back slightly.
- Install centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - parking brake lever trim .

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





4 Brake pedal

⇒ [“4.1 Assembly overview - brake pedal”, page 51](#)

⇒ [“4.2 Separating brake pedal from brake servo”, page 53](#)

⇒ [“4.3 Connecting brake pedal to brake servo”, page 54](#)

⇒ [“4.4 Removing and installing brake pedal”, page 54](#)

⇒ [“4.5 Removing and installing mounting bracket”, page 55](#)

4.1 Assembly overview - brake pedal

⇒ [“4.1.1 Assembly overview - brake pedal, left-hand drive”, page 51](#)

⇒ [“4.1.2 Assembly overview - brake pedal, right-hand drive”, page 52](#)

4.1.1 Assembly overview - brake pedal, left-hand drive



Note

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

The brake light switch is located on the brake master cylinder.



1 - Pedal cluster

- ❑ Removing and installing
⇒ [page 55](#)

2 - Hexagon bolt

3 - Hexagon nut, self-locking

- ❑ Renew after each re-
moval.
- ❑ 25 Nm

4 - Brake pedal

- ❑ Removing and installing
⇒ [page 54](#)

5 - Cap

6 - Bearing bush

7 - Support

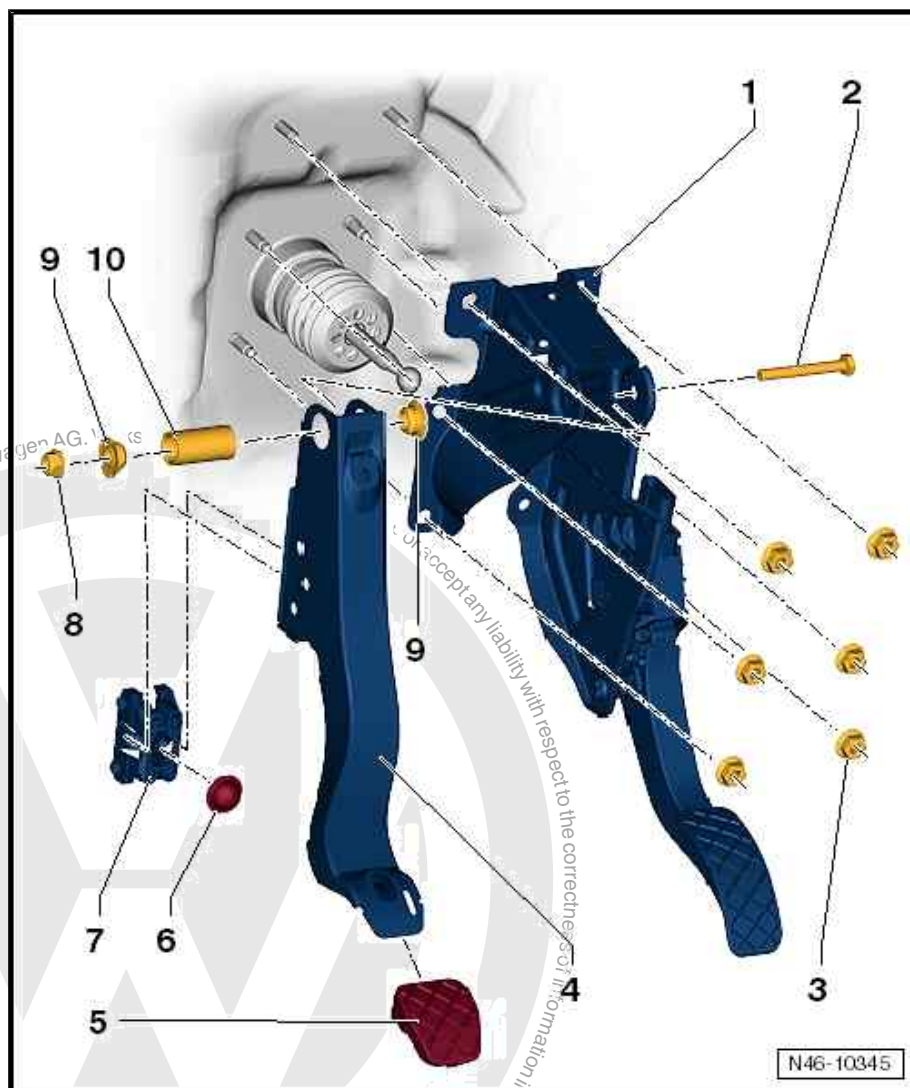
- ❑ For ball head of brake
servo push rod

8 - Hexagon nut, self-locking

- ❑ Renew after each re-
moval.
- ❑ 25 Nm

9 - Bearing bush

10 - Bearing mounting



4.1.2 Assembly overview - brake pedal, right-hand drive



Note

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

The brake light switch is located on the brake master cylinder.



1 - Cover

2 - Pedal cluster

- ❑ Removing and installing
⇒ [page 55](#)

3 - Hexagon nut, self-locking

- ❑ Renew after each removal.
- ❑ 25 Nm

4 - Hexagon nut, self-locking

- ❑ Renew after each removal.
- ❑ 25 Nm

5 - Brake pedal

- ❑ Removing and installing
⇒ [page 55](#)

6 - Cap

7 - Crash bar

8 - Hexagon bolt

- ❑ Specified torque ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .

9 - Bearing bush

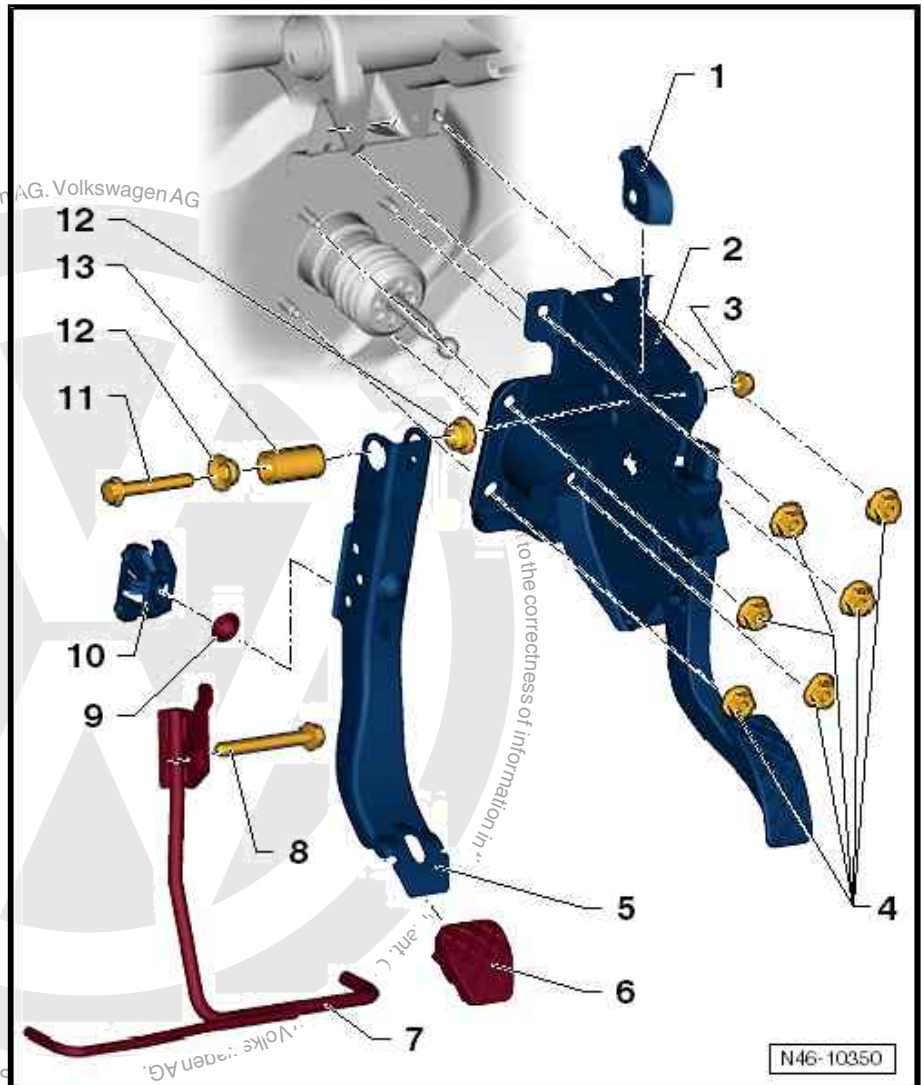
10 - Support

- ❑ For ball head of brake servo push rod

11 - Hexagon bolt

12 - Bearing bush

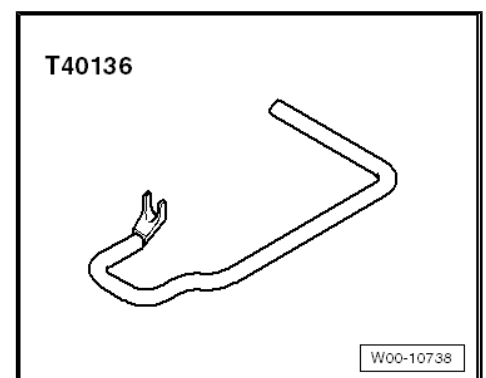
13 - Bearing mounting



4.2 Separating brake pedal from brake servo

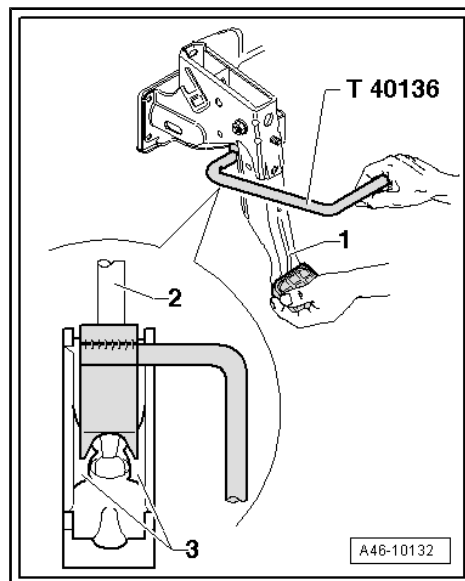
Special tools and workshop equipment required

- ◆ Release tool - T40136-





- First press brake pedal in direction of brake servo and hold.
 - 1 - Brake pedal
 - 2 - Push bar
 - 3 - Retaining lugs
 - Insert release tool - T40136- and pull in direction of driver seat. When doing this, counter-hold on brake pedal. (At this stage the brake 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 - T40136- and brake pedal together towards driver seat. (This action will pull the brake pedal off the ball head of the plunger rod).



4.3 Connecting brake pedal to brake servo

- Hold ball head of push rod in front of mounting and push brake pedal in direction of brake servo, so that the ball head clicks into place.
- Pull brake pedal briefly to ensure parts are engaged correctly.



4.4 Removing and installing brake pedal

⇒ [“4.4.1 Removing and installing brake pedal, left-hand drive vehicles”, page 54](#)

⇒ [“4.4.2 Removing and installing brake pedal, right-hand drive vehicles”, page 55](#)

4.4.1 Removing and installing brake pedal, left-hand drive vehicles

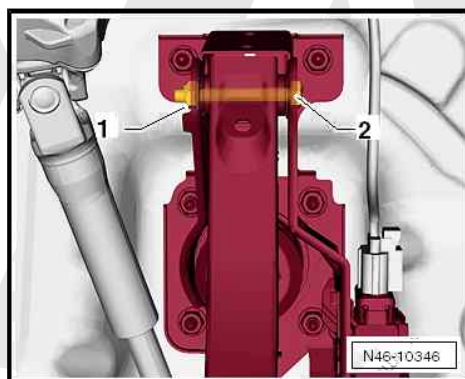
Removing:

- Separate brake pedal from brake servo ⇒ [page 53](#) .
- Unscrew hexagon nut -1-.
- Pull out hexagon bolt -2-.
- Remove brake pedal.

Installing:

Install in reverse order.

- Clip brake pedal to brake servo ⇒ [page 54](#) .





4.4.2 Removing and installing brake pedal, right-hand drive vehicles

Separate removal of the brake pedal in the vehicle is not possible since the hexagon bolt cannot be fully withdrawn.

- First remove pedal cluster ⇒ [page 55](#) and then brake pedal.

4.5 Removing and installing mounting bracket

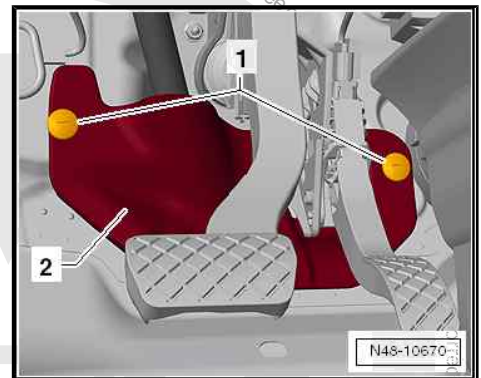
⇒ [“4.5.1 Removing and installing pedal cluster \(LHD\)”](#), [page 55](#)

⇒ [“4.5.2 Removing and installing pedal cluster \(RHD\)”](#), [page 55](#)

4.5.1 Removing and installing pedal cluster (LHD)

Removing:

- Unscrew bolts -1- and remove footwell trim -2-.
- Pull connector off accelerator pedal position sender.
- Separate brake pedal from brake servo ⇒ [page 53](#) .



- Remove hexagon nuts -arrows- from pedal cluster.
- Remove foot pedal cluster.

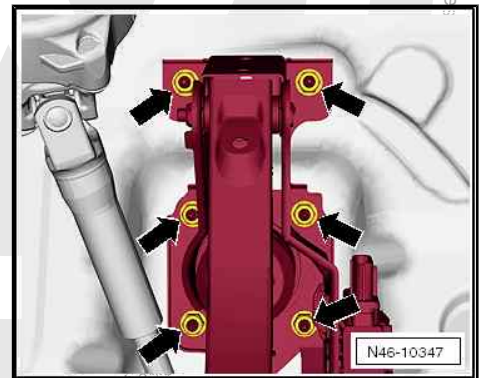
Installing:

Install in reverse order.

- Clip brake pedal to brake servo ⇒ [page 54](#) .

Specified torque:

- ◆ ⇒ [“4.1.1 Assembly overview - brake pedal, left-hand drive”](#), [page 51](#)



4.5.2 Removing and installing pedal cluster (RHD)

Removing:

- Remove dash panel end cover ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel end cover .
- Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .
- Separate brake pedal from brake servo ⇒ [page 53](#) .
- Remove crash bar ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .



- Pull connector off accelerator pedal position sender.
- Remove hexagon nuts -arrows- from pedal cluster.
- Remove foot pedal cluster.

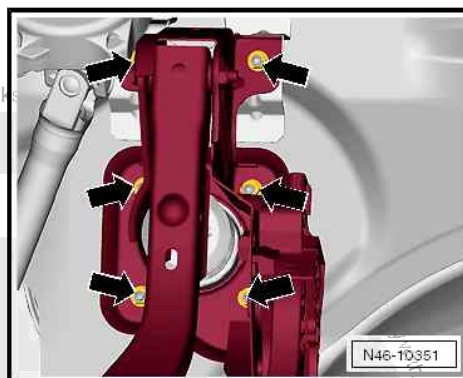
Installing:

Install in reverse order.

- Clip brake pedal to brake servo ⇒ [page 54](#) .

Specified torques:

- ♦ ⇒ ["4.1.2 Assembly overview - brake pedal, right-hand drive", page 52](#)
- ♦ Crash bar to steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .





47 – Brakes - hydraulics

1 Front brake caliper

⇒ [“1.1 Assembly overview – front brake caliper”, page 57](#)

⇒ [“1.2 Removing and installing brake caliper piston”, page 59](#)

1.1 Assembly overview – front brake caliper

⇒ [“1.1.1 Assembly overview - brake caliper FS III”, page 57](#)

⇒ [“1.1.2 Assembly overview - brake caliper, PC57”, page 58](#)

1.1.1 Assembly overview – brake caliper FS III

- ◆ Install complete repair kit when servicing.
- ◆ Only use methylated spirits to clean brakes.
- ◆ Apply thin coat of lithium grease - G 052 150 A2- to brake cylinder, piston and seal.

1 - Dust cap

- ☐ Fit onto bleed valve

2 - Bleeder valve

- ☐ Before screwing in, grease thread with thin coat of lithium grease - G 052 150 A2-
- ☐ 10 Nm

3 - Bearing bush

- ☐ Insert into brake caliper.

4 - Guide pin

- ☐ 30 Nm

5 - Caps

- ☐ Insert into mounting bush.

6 - Brake caliper

7 - Seal

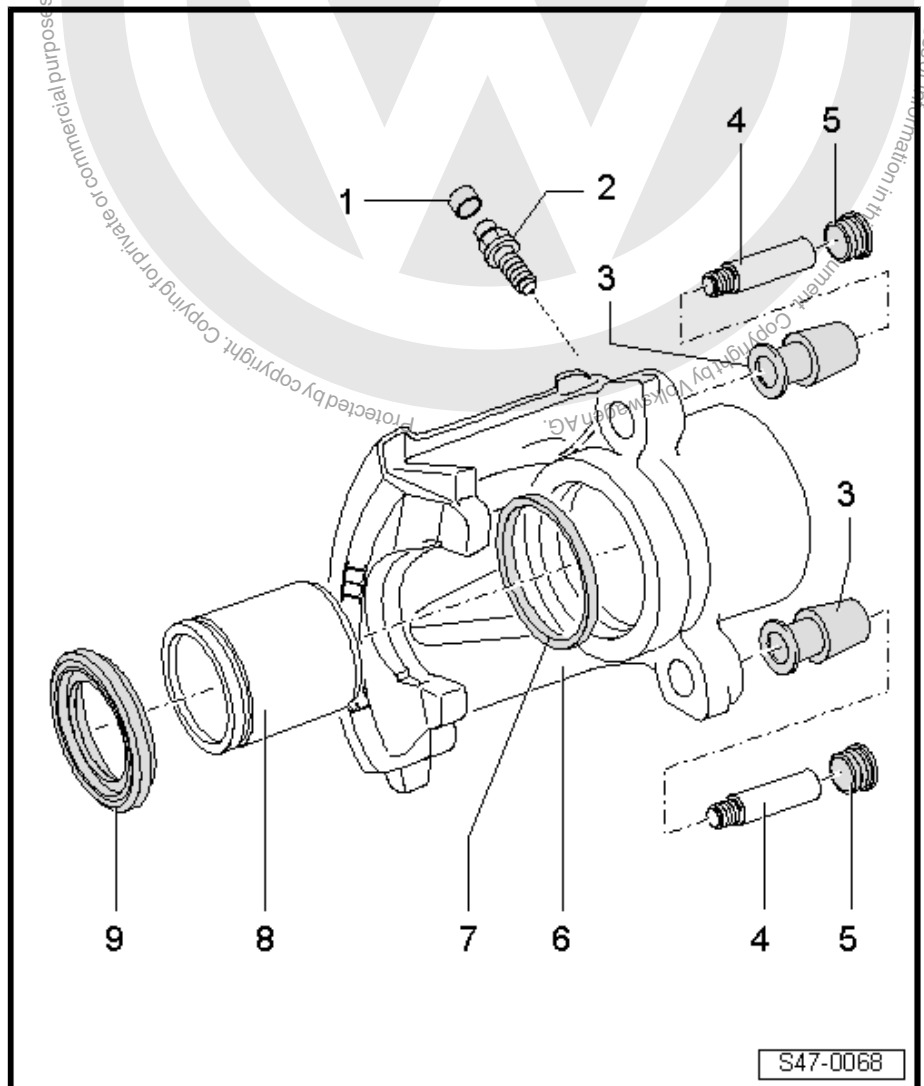
- ☐ Removing and installing
⇒ [page 59](#)

8 - Piston

- ☐ Apply a thin coat of lithium grease - G 052 150 A2- to piston
- ☐ Removing and installing
⇒ [page 59](#)

9 - Seal

- ☐ Removing and installing
⇒ [page 59](#)





1.1.2 Assembly overview - brake caliper, PC57

- ◆ Install complete repair kit when servicing.
- ◆ Only use methylated spirits to clean brakes.
- ◆ Apply thin coat of assembly paste G 052 150 A2 to brake cylinders, pistons and seals.

1 - Dust cap

- ❑ Fit onto bleeder valve.

2 - Bleeder valve

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

3 - Hexagon bolt

- ❑ Renew after removal
- ❑ 35 Nm

4 - Guide pin

5 - Protective cap

- ❑ Insert into brake carrier and guide pin groove; grease groove beforehand, use repair kit grease pack.

6 - Brake carrier

- ❑ Supplied as pre-assembled replacement part with greased guide pins and protective caps.
- ❑ If protective caps or guide pins are damaged, install repair kit. Use lubricant sachet supplied to lubricate guide pins.

7 - Protective cap

- ❑ Removing and installing ⇒ [page 60](#)
- ❑ When inserting piston, take care not to damage it.

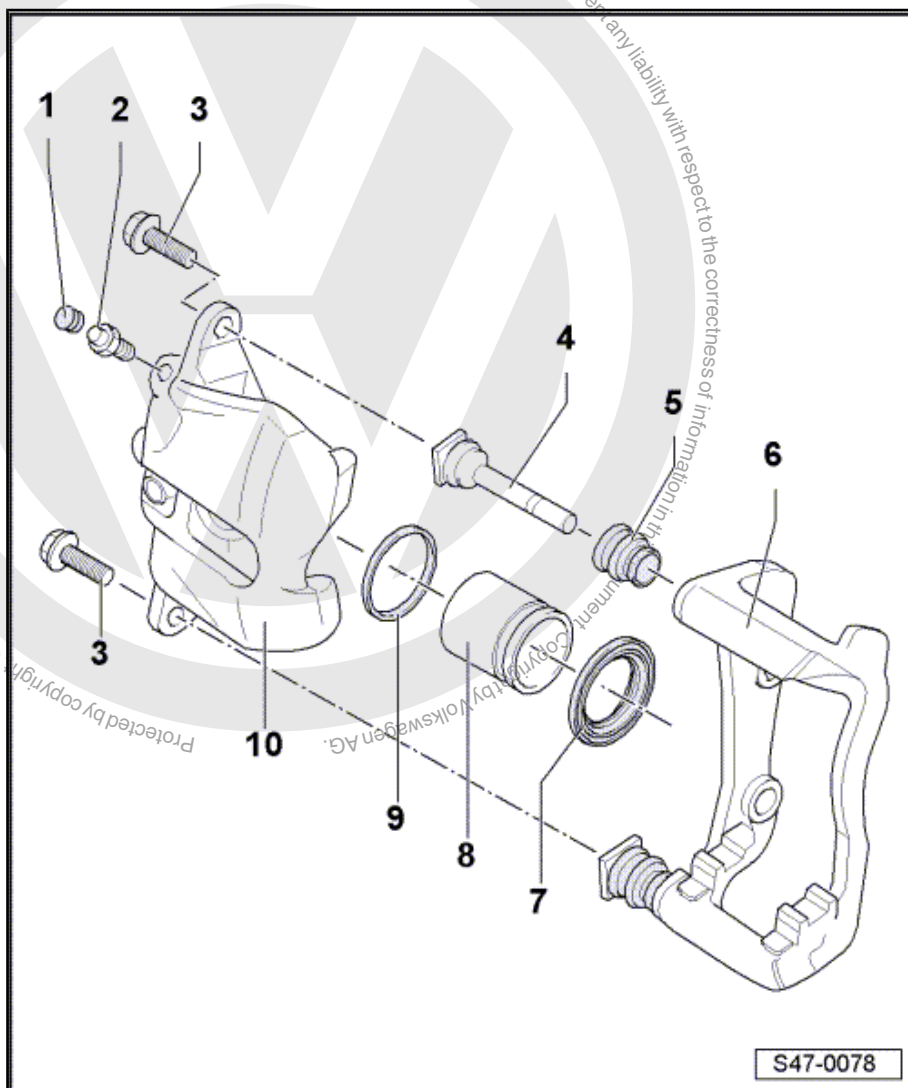
8 - Piston

- ❑ Removing and installing ⇒ [page 60](#)
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before inserting.

9 - Seal

- ❑ Removing and installing ⇒ [page 60](#)

10 - Brake caliper





1.2 Removing and installing brake caliper piston

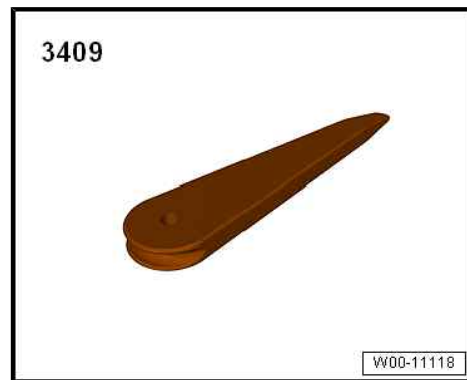
⇒ ["1.2.1 Removing and installing brake caliper FS III", page 59](#)

⇒ ["1.2.2 Removing and installing PC57 brake caliper piston", page 60](#)

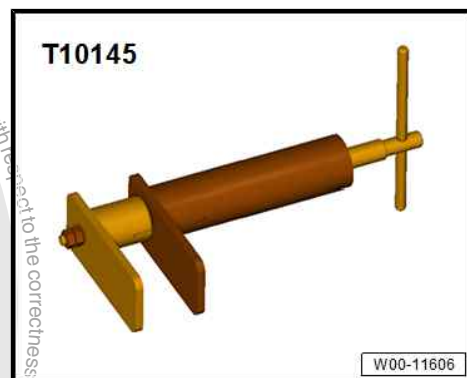
1.2.1 Removing and installing brake caliper FS III

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



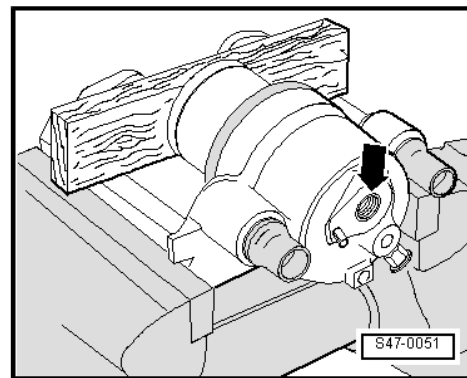
- ◆ Piston resetting appliance - T10145-



Removing

Press piston out of brake caliper using compressed air.

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



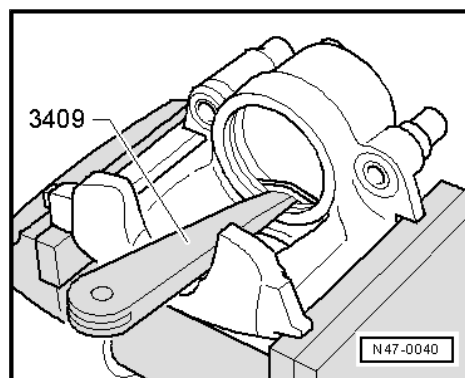


- Remove seal using removal wedge - 3409- .

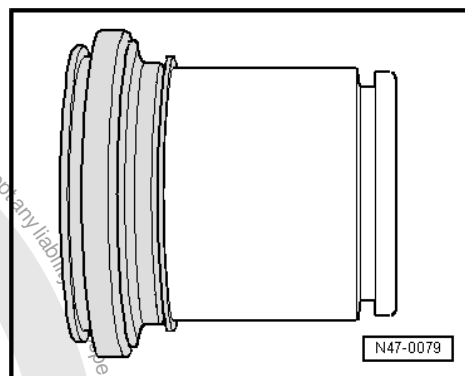
When removing ensure that the surface of the cylinder is not damaged.

Installing

- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Apply a thin coat of lithium grease - G 052 150 A2- to piston and seal before inserting.
- Insert seal in brake caliper.

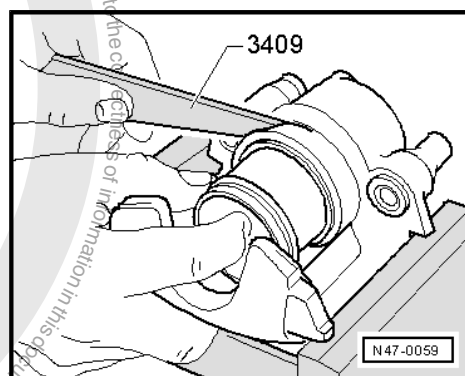


- Place protective cap with outer sealing lip on piston.



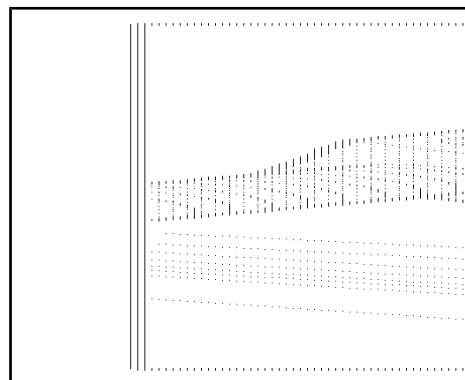
- Using removal wedge - 3409- , insert inner sealing lip into cylinder groove.

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



- Press piston into brake caliper using piston resetting appliance .

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



1.2.2 Removing and installing PC57 brake caliper piston

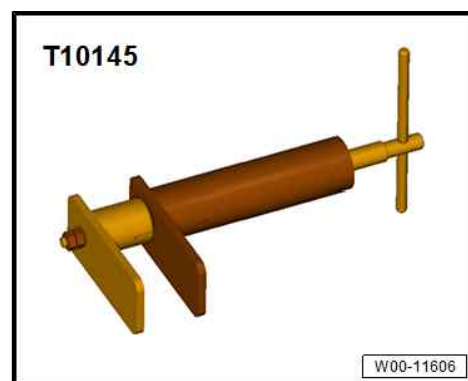
Special tools and workshop equipment required



◆ Removal wedge - 3409-



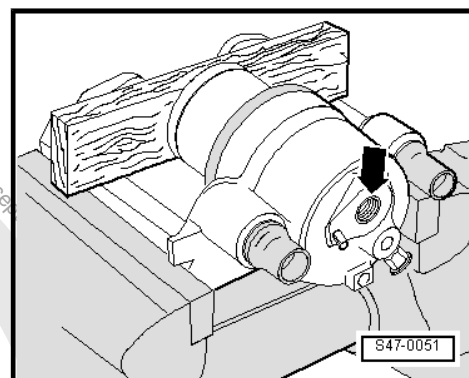
◆ Piston resetting appliance - T10145-



Removing

- Press piston out of brake caliper using compressed air.

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

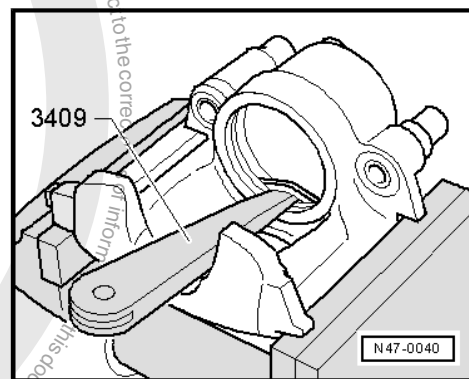


- Remove seal using wedge 3409.

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

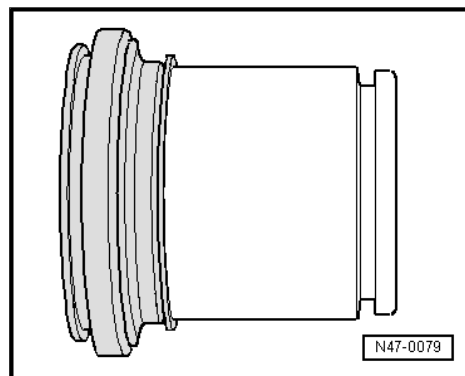
Installing

- 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 in brake caliper.



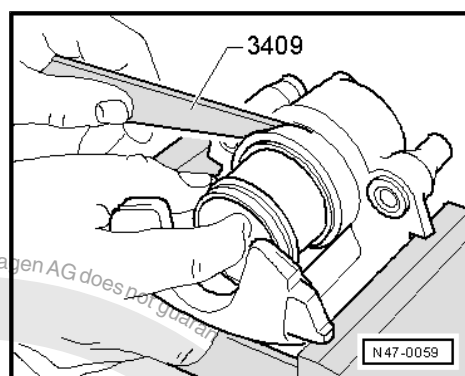


- Place protective cap with outer sealing lip on piston.



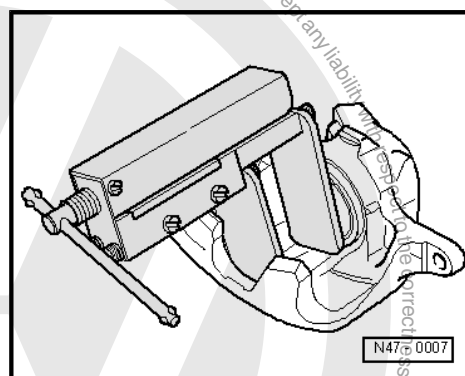
- Insert inner sealing lip into groove in cylinder using wedge 3409.

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



- Press piston into brake caliper using piston resetting appliance.

The outer sealing lip of the protective cap will then lock in the groove of the piston.





2 Brake servo and brake master cylinder

⇒ [“2.1 Assembly overview - brake servo/brake master cylinder”, page 63](#)

⇒ [“2.2 Removing and installing brake light switch”, page 66](#)

⇒ [“2.3 Removing and installing brake master cylinder”, page 69](#)

⇒ [“2.4 Removing and installing brake servo”, page 74](#)

2.1 Assembly overview - brake servo/brake master cylinder

⇒ [“2.1.1 Assembly overview - brake servo/brake master cylinder, left-hand drive vehicles”, page 63](#)

⇒ [“2.1.2 Assembly overview - brake servo/brake master cylinder, right-hand drive”, page 65](#)

2.1.1 Assembly overview - brake servo/brake master cylinder, left-hand drive vehicles



Note

Only use new brake fluid conforming to VW standard (VW 501 14).

1 - Brake fluid level warning contact - F34-

2 - Cap

3 - Vacuum hose

- Including non-return valve.

4 - Pressure sensor

- ❑ Only in vehicles with start-stop system.

5 - Brake fluid reservoir

6 - Sealing plug

7 - Brake servo

- ❑ Checking function
 - With engine switched off, depress brake pedal firmly several times (to exhaust any negative pressure in the unit).

- Now depress brake pedal with average foot pressure, hold and start engine. If the servo unit is working properly, the brake pedal will now give perceptibly under foot (servo assistance becomes activated).

- ❑ Renew completely in the event of a fault. Before doing so, check brake servo vacuum system ⇒ [page 84](#) .
- ❑ Non-return valve (in vacuum hose) functional check ⇒ [page 82](#) .
- ❑ Separating from brake pedal ⇒ [page 53](#)
- ❑ Removing and installing ⇒ [page 74](#)

8 - Seal

- ☐ Renew if damaged

9 - Hexagon nut, self-locking

- ☐ Renew after each removal.
- ☐ 25 Nm

10 - Seal

- ☐
- Renew

11 - Brake master cylinder

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

12 - Brake light switch - F-

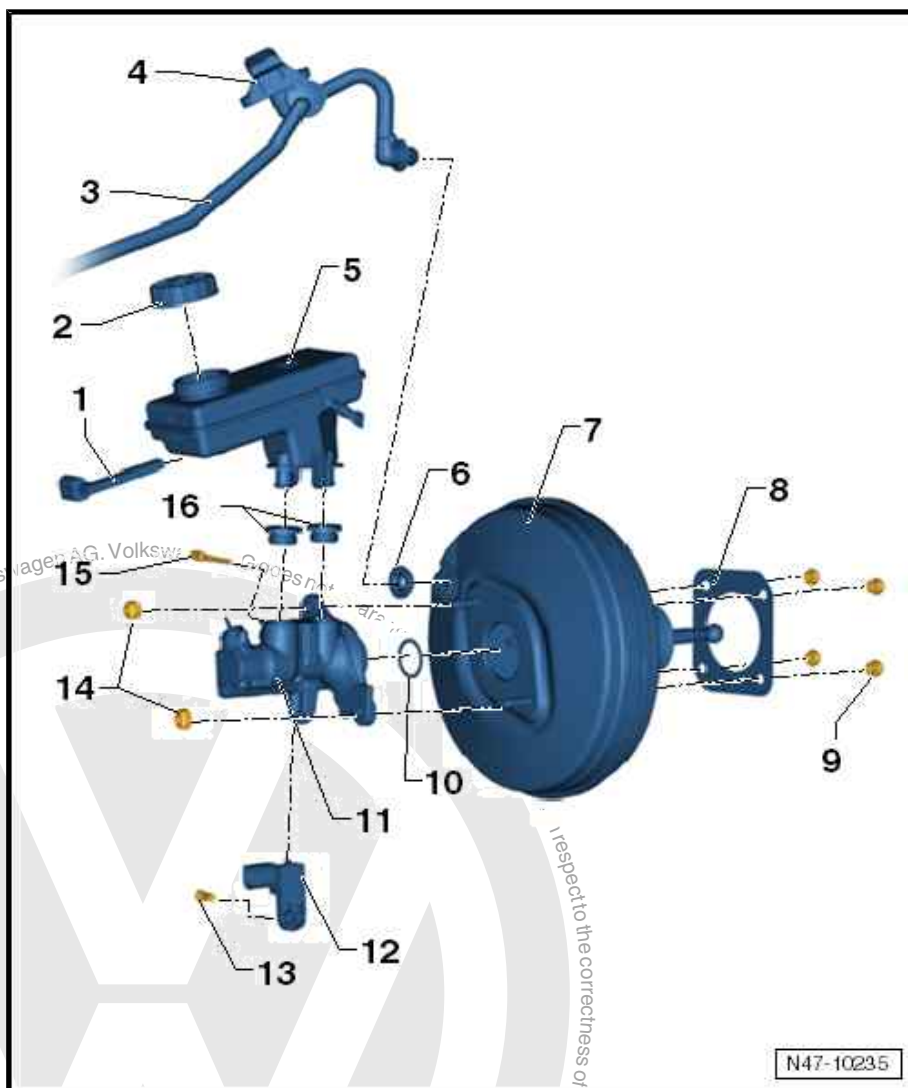
- ❑ Including brake pedal switch - F47-
- ❑ Removing and installing ⇒ [page 66](#)

13 - Torx bolt

- ☐ 7 Nm

14 - Hexagon nut, self-locking

- ☐ Renew after each removal.





- ☐ 23 Nm

15 - Torx bolt

- ☐ 8 Nm

16 - Sealing plug

- ☐ Moisten with brake fluid and press into brake master cylinder.

2.1.2 Assembly overview - brake servo/brake master cylinder, right-hand drive



Note

Only use new brake fluid conforming to VW standard (VW 501 14).

1 - Brake fluid level warning contact - F34-

2 - Cap

3 - Brake fluid reservoir

4 - Sealing plug

- ☐ Moisten with brake fluid and press into brake master cylinder.

5 - Brake servo

- ☐ Checking function
 - With engine switched off, depress brake pedal firmly several times (to exhaust any negative pressure in the unit).
 - Now depress brake pedal with average foot pressure, hold and start engine. If the servo unit is working properly, the brake pedal will now give perceptibly under foot (servo assistance becomes activated).

- ☐ Renew completely in the event of a fault. Before doing so, check brake servo vacuum system ➔ [page 84](#).

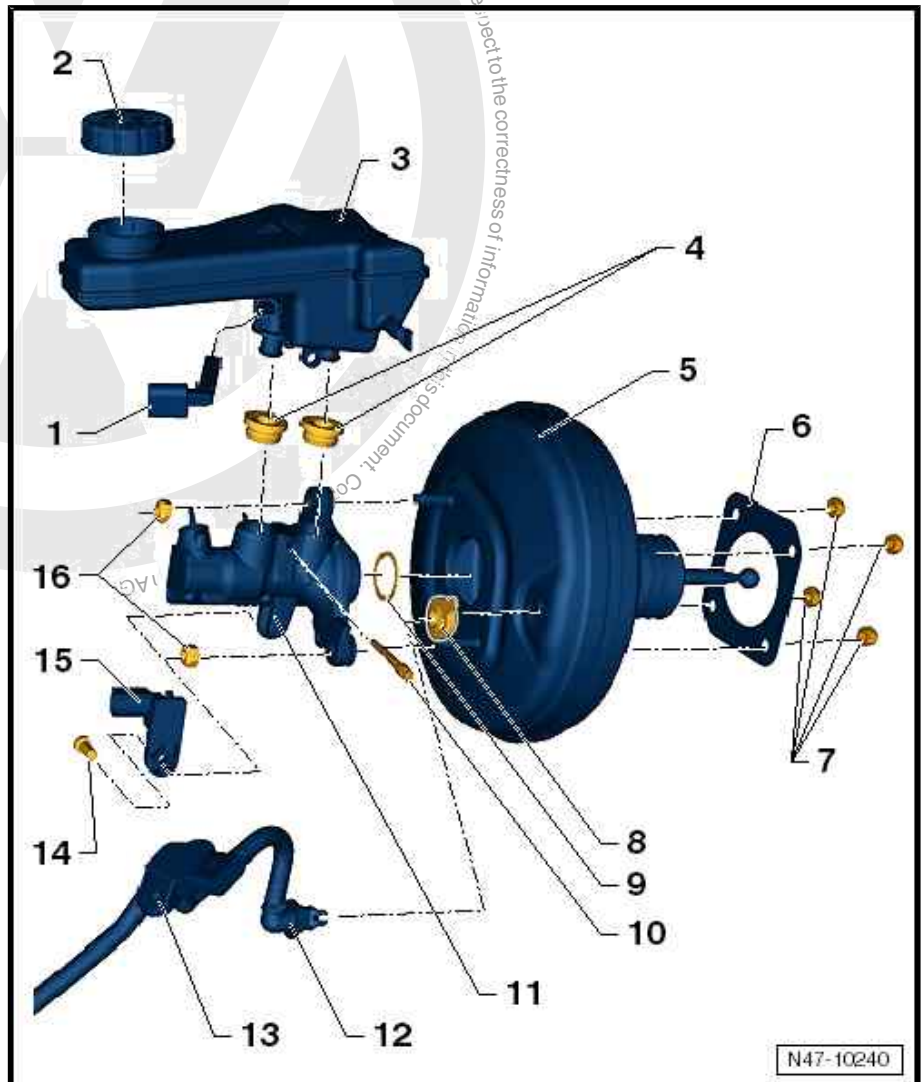
- ☐ Non-return valve (in vacuum hose) functional check ➔ [page 82](#).

- ☐ Separating from brake pedal ➔ [page 53](#)

- ☐ Removing and installing ➔ [page 77](#)

6 - Seal

- ☐ Renew if damaged





7 - Hexagon nut, self-locking

- ☐ Renew after each removal.
- ☐ 25 Nm

8 - Sealing plug

9 - Seal

- ☐ Renew

10 - Torx bolt

- ☐ 8 Nm

11 - Brake master cylinder

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

12 - Vacuum hose

- ☐ Including non-return valve.

13 - Pressure sensor

- ☐ Only in vehicles with start-stop system.

14 - Torx bolt

- ☐ 7 Nm

15 - Brake light switch - F-

- ☐ Including brake pedal switch - F47- .
- ☐ Removing and installing ⇒ [page 67](#)

16 - Hexagon nut, self-locking

- ☐ Renew after each removal.
- ☐ 23 Nm

2.2 Removing and installing brake light switch

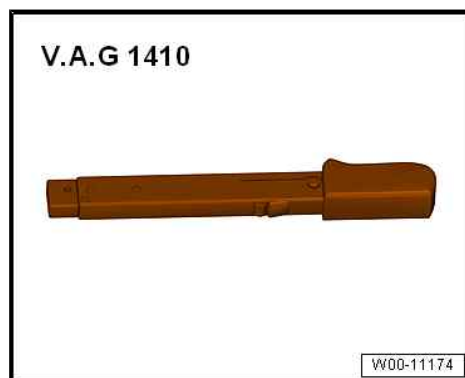
⇒ ["2.2.1 Removing and installing brake light switch, LHD", page 66](#)

⇒ ["2.2.2 Removing and installing brake light switch, right-hand drive", page 67](#)

2.2.1 Removing and installing brake light switch, LHD

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



Removing:

- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .



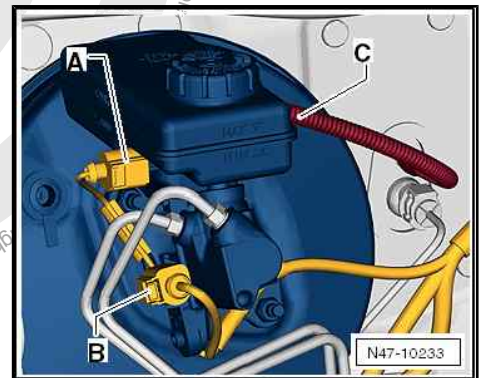
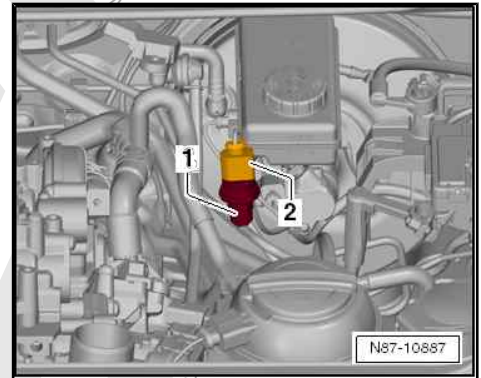
Only for vehicles with air conditioning system:

- Disconnect connector -2- from high-pressure sender - G65-1-.

Continued for all vehicles:

- Disconnect connector -A- from brake fluid level warning contact - F34- .

- Pull connector -B- off brake light switch - F- .

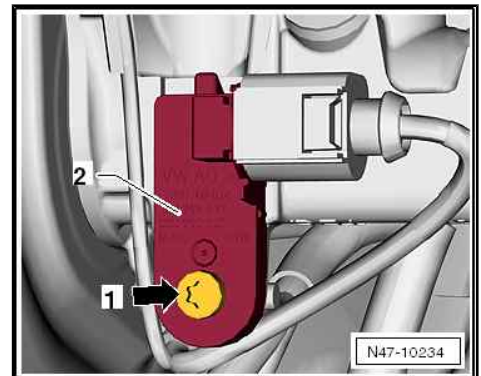


- Lay connectors together with wiring harness to side.
- Unscrew bolt -1 arrow- from brake master cylinder.
- Pull brake light switch - F- -2- off brake master cylinder.

Installing:

- Install in reverse order.

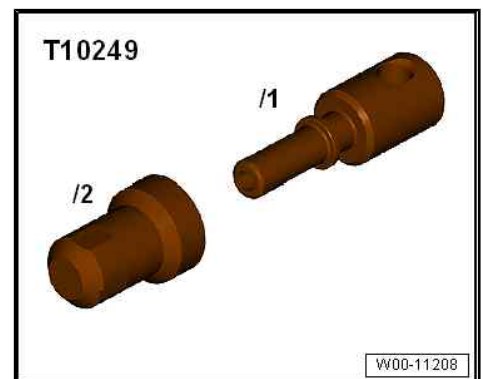
- ◆ ⇒ [“2.1.1 Assembly overview - brake servo/brake master cylinder, left-hand drive vehicles”, page 63](#)



2.2.2 Removing and installing brake light switch, right-hand drive

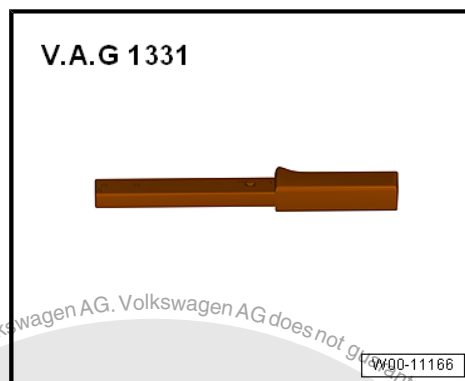
Special tools and workshop equipment required

- ◆ Sealing tool - T10249-

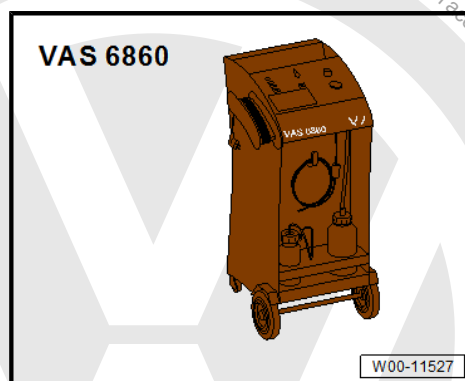




- ◆ Torque wrench - V.A.G 1331-

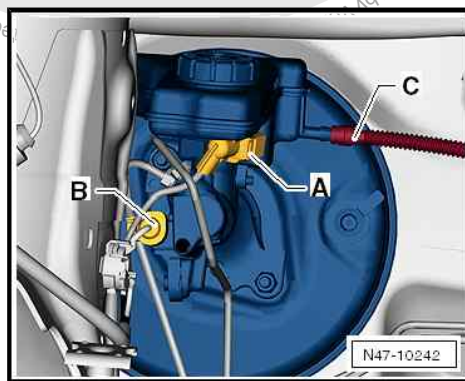


- ◆ Brake filling and bleeding equipment - VAS 6860-



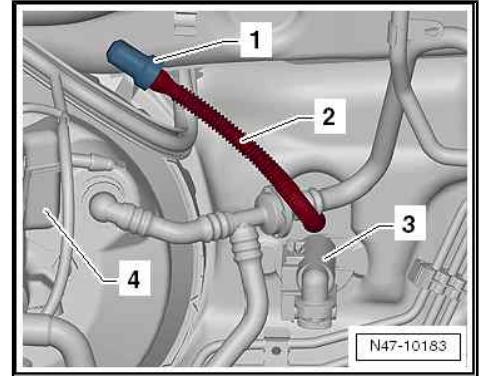
Removing:

- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Place sufficient lint-free cloths in adjacent area.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- .
- Disconnect connector -A- from brake fluid level warning contact - F34- .
- Pull connector -B- off brake light switch - F- .

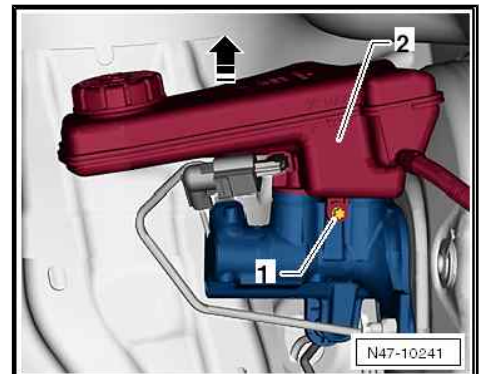




- Disconnect return hose -C- for clutch master cylinder from brake fluid reservoir.
- Seal supply hose -2- for clutch master cylinder -3- with sealing tool - T10249- -1- or engine bung set - VAS 6122- .
- Tie return hose -2- in place above.



- Unscrew Torx bolt -1- from retaining lug of brake fluid reservoir and from brake master cylinder.
- Pull brake fluid reservoir -2- upwards -arrow- out of brake master cylinder.



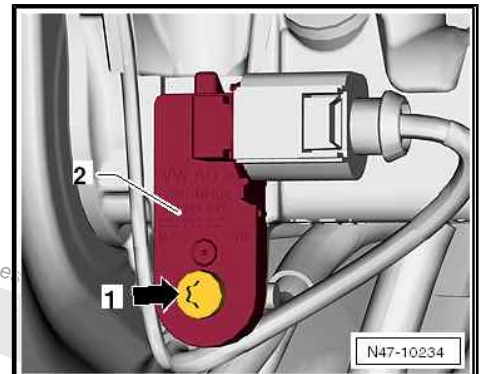
- Lay connectors together with wiring harness to side.
- Unscrew bolt -1 arrow- from brake master cylinder.
- Pull brake light switch - F- -2- off brake master cylinder.

Installing:

- Install in reverse order.
- Bleed brake system ➔ [page 94](#) .

Specified torques

- ◆ ➔ [“2.1.2 Assembly overview - brake servo/brake master cylinder, right-hand drive”, page 65](#)



2.3 Removing and installing brake master cylinder

➔ [“2.3.1 Removing and installing brake master cylinder, left-hand drive”, page 69](#)

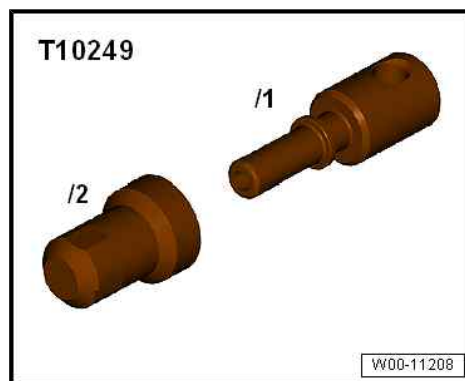
➔ [“2.3.2 Removing and installing brake master cylinder, RHD”, page 72](#)

2.3.1 Removing and installing brake master cylinder, left-hand drive

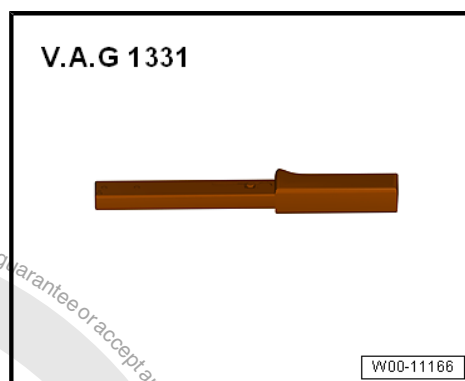
Special tools and workshop equipment required



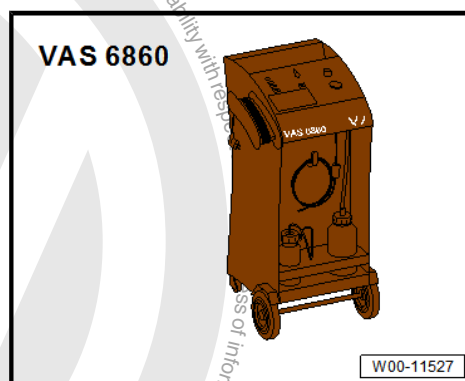
◆ Sealing tool - T10249-



◆ Torque wrench - V.A.G 1331-



◆ Brake filling and bleeding equipment - VAS 6860-



Removing:

- Note or request radio code on vehicles with coded radio if necessary.
- Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Lay out sufficient lint free clothes in area of engine and gear-box.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- .

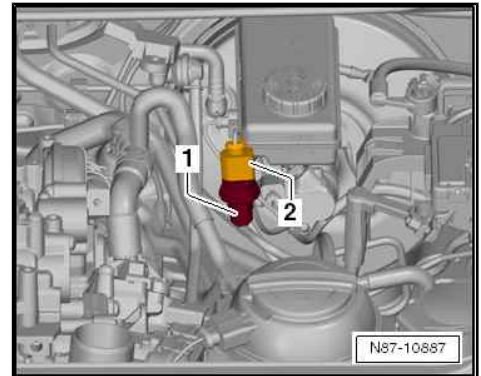


Only for vehicles with air conditioning system:

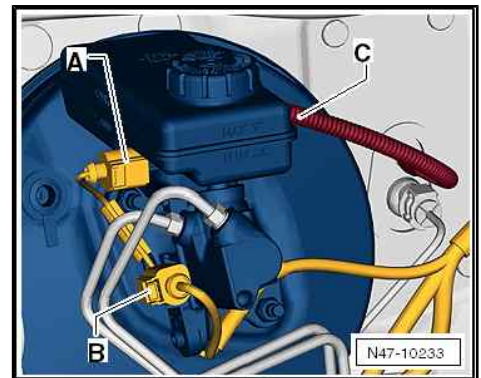
- Disconnect connector -2- from high-pressure sender - G65- -1-.

Continued for all vehicles:

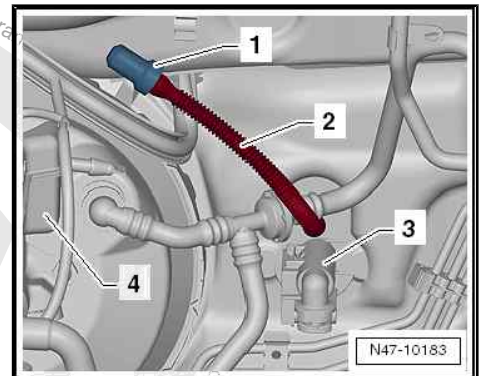
- Disconnect connector -A- from brake fluid level warning contact - F34- .
- Pull connector -B- off brake light switch - F- .



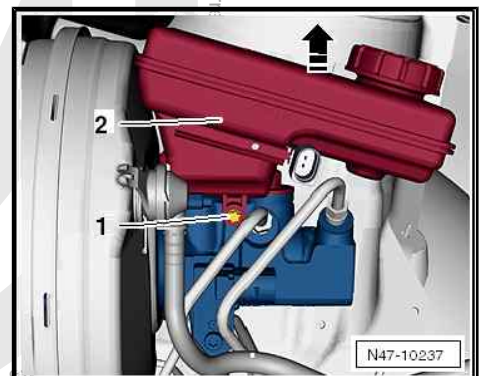
- Then unclip wiring harness from brake master cylinder.



- Disconnect return hose -C- for clutch master cylinder from brake fluid reservoir.
- Seal supply hose -2- for clutch master cylinder -3- with sealing tool - T10249- -1- or engine bung set - VAS 6122- .
- Tie return hose -2- in place above.



- Unscrew Torx bolt -1- from retaining lug of brake fluid reservoir and from brake master cylinder.
- Pull brake fluid reservoir -2- upwards -arrow- out of brake master cylinder.





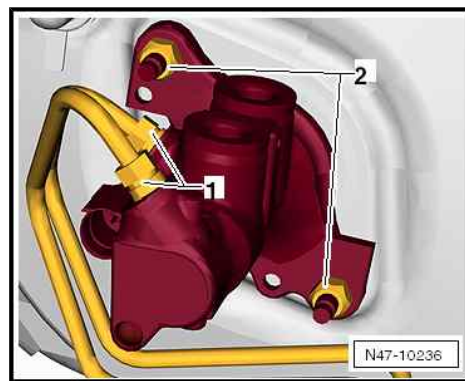
- Mark and unscrew brake lines from brake master cylinder -1-.
- Unscrew nuts -2- from brake master cylinder.
- Carefully remove brake master cylinder from brake servo.
- Detach brake light switch - F- .

Installing:

- Install in reverse order.

Observe the following important points when installing:

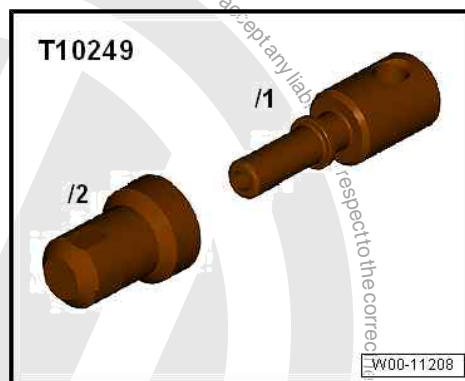
- When assembling brake master cylinder with brake servo, make sure plunger rod and seal are properly positioned in brake master cylinder.
- Bleed brake system ➔ [page 94](#) .
- ♦ ➔ ["2.1.1 Assembly overview - brake servo/brake master cylinder, left-hand drive vehicles"](#), [page 63](#)



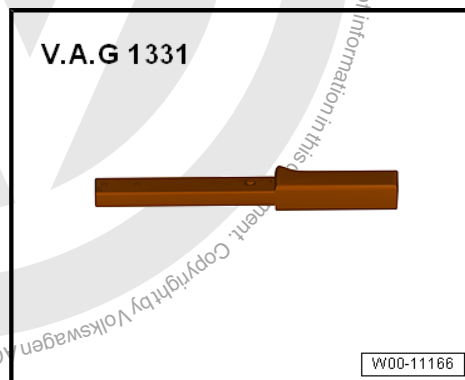
2.3.2 Removing and installing brake master cylinder, RHD

Special tools and workshop equipment required

- ♦ Sealing tool - T10249-

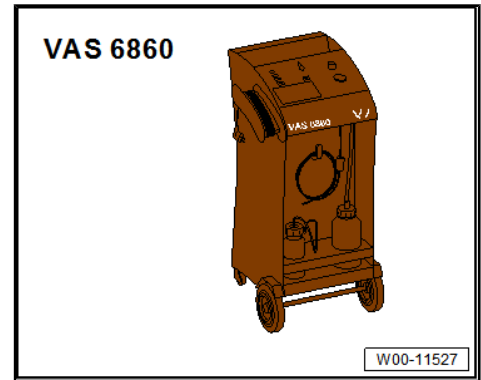


- ♦ Torque wrench - V.A.G 1331-



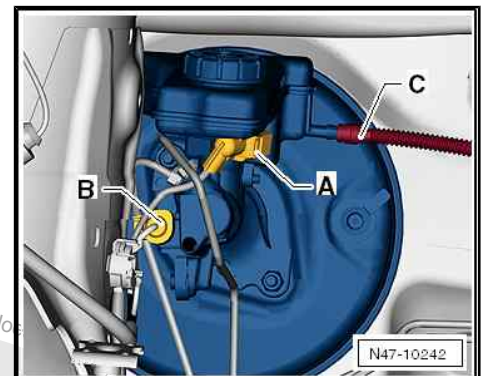


◆ Brake filling and bleeding equipment - VAS 6860-

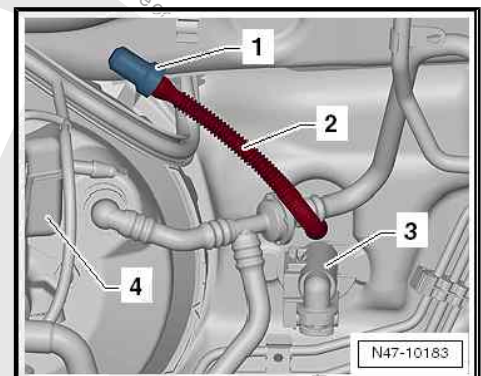


Removing:

- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Place sufficient lint-free cloths in adjacent area.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- .
- Disconnect connector -A- from brake fluid level warning contact - F34- .
- Pull connector -B- off brake light switch - F- .

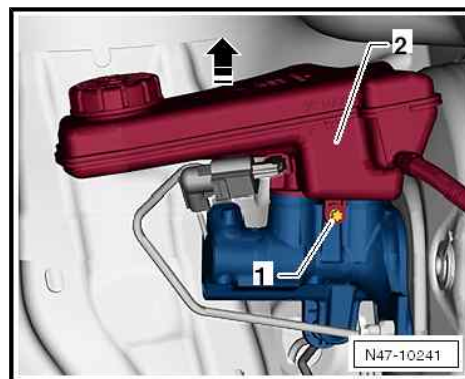


- Disconnect return hose -C- for clutch master cylinder from brake fluid reservoir.
- Seal supply hose -2- for clutch master cylinder -3- with sealing tool - T10249- -1- or engine bung set - VAS 6122- .
- Tie return hose -2- in place above.

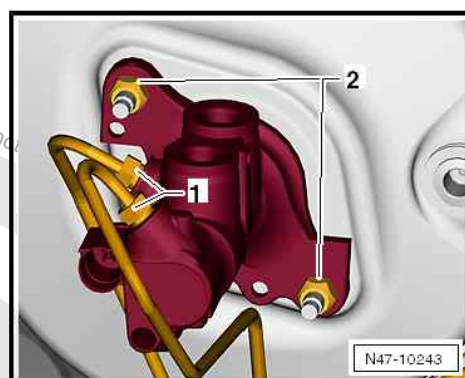




- Unscrew Torx bolt -1- from retaining lug of brake fluid reservoir and from brake master cylinder.
- Pull brake fluid reservoir -2- upwards -arrow- out of brake master cylinder.



- Mark and unscrew brake lines from brake master cylinder -1-.
- Unscrew nuts -2- from brake master cylinder.
- Carefully remove brake master cylinder from brake servo.
- Detach brake light switch - F -.



Installing:

- Install in reverse order.

Observe the following important points when installing:

- When assembling brake master cylinder with brake servo, make sure plunger rod and seal are properly positioned in brake master cylinder.
- Bleed brake system ➔ [page 94](#) .
- ♦ ➔ [“2.1.2 Assembly overview - brake servo/brake master cylinder, right-hand drive”, page 65](#)

2.4 Removing and installing brake servo

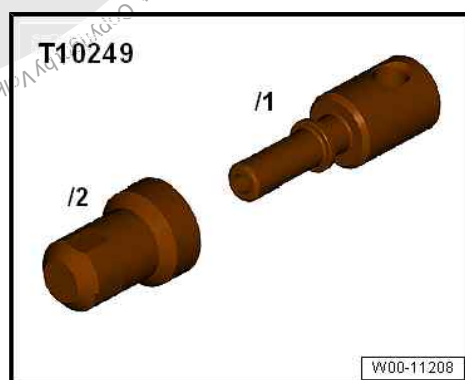
⇒ [“2.4.1 Removing and installing brake servo, LHD”, page 74](#)

⇒ [“2.4.2 Removing and installing brake servo, RHD”, page 77](#)

2.4.1 Removing and installing brake servo, LHD

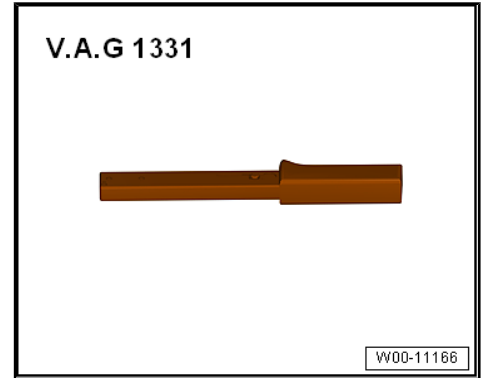
Special tools and workshop equipment required

- ♦ Sealing tool - T10249-

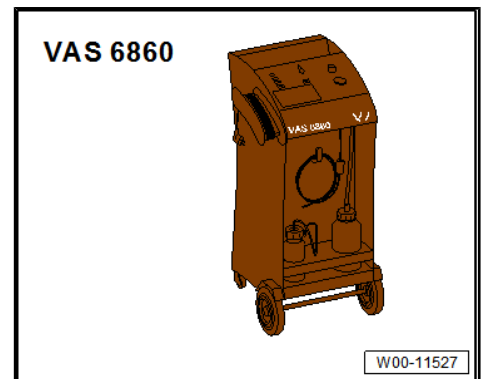




◆ Torque wrench - V.A.G 1331-



◆ Brake filling and bleeding equipment - VAS 6860-



Removing:

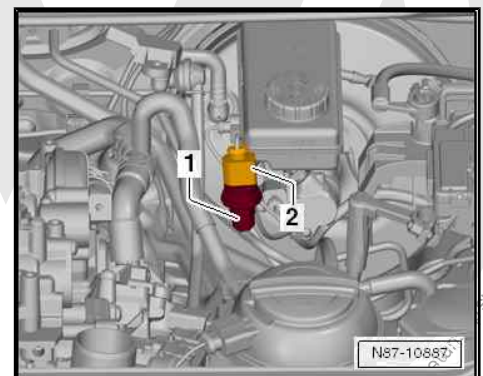
- Note or request radio code on vehicles with coded radio if necessary.
- Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Unbolt engine control unit with bracket and lay to side ⇒ Rep. gr. 24 ; Engine control unit; Assembly overview - engine control unit .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Lay out sufficient lint free clothes in area of engine and gear-box.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- .

Only for vehicles with air conditioning system:

- Disconnect connector -2- from high-pressure sender - G65- -1-.

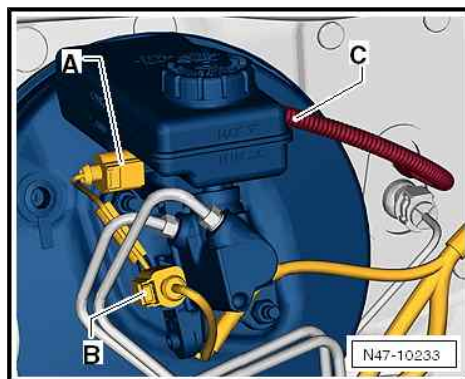
Continued for all vehicles:

- Disconnect connector -A- from brake fluid level warning contact - F34- .
- Pull connector -B- off brake light switch - F- .

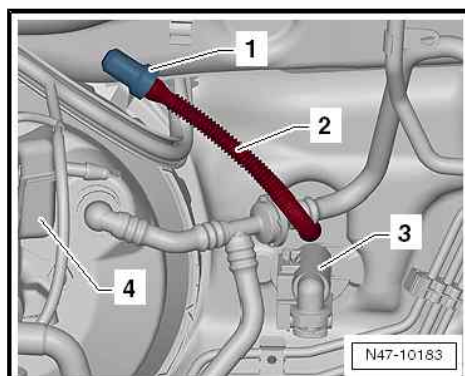




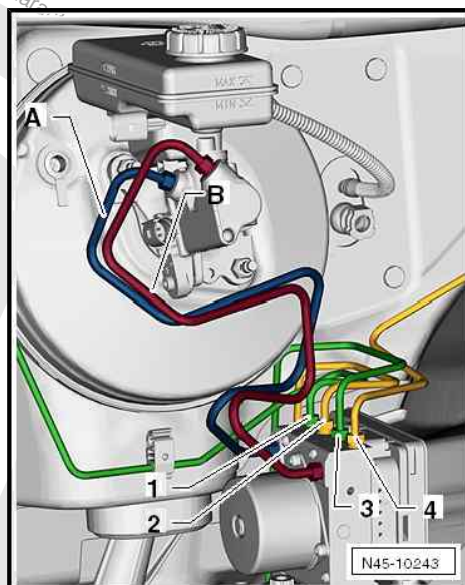
- Then unclip wiring harness from brake master cylinder.



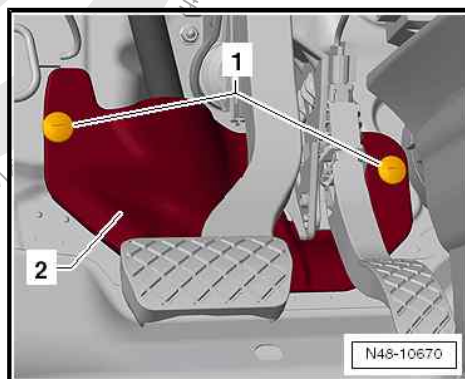
- Disconnect return hose -C- for clutch master cylinder from brake fluid reservoir.
- Seal supply hose -2- for clutch master cylinder -3- with sealing tool - T10249- -1- or engine bung set - VAS 6122- .
- Tie return hose -2- in place above.
- Pull vacuum hose out of brake servo.



- Mark and unscrew brake lines -A and B- from brake master cylinder and immediately seal brake lines with plugs from repair kit Part No. 1H0 698 311 A.
- Then slightly loosen brake lines -A and B- from hydraulic unit and lay to side.



- Unscrew bolts -1- and remove footwell trim -2-.
- Separate brake pedal from brake servo ⇒ [page 53](#) .





- Remove hexagon nuts -arrows-.
- Carefully remove brake servo from the vehicle.
- If brake servo sticks in holes, loosen both remaining nuts on mounting bracket.
- Unscrew brake master cylinder from brake servo.
- Carefully remove brake master cylinder from brake servo.

Installing:

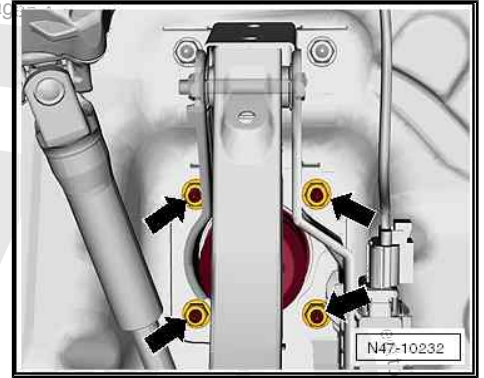
- Install in reverse order.

Observe following points when installing:

- Clip brake pedal to brake servo ➔ [page 54](#) .
- Bleed brake system ➔ [page 94](#) .

Specified torques

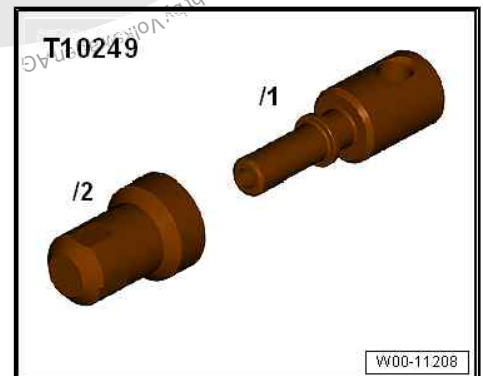
- ◆ ➔ [“2.1.1 Assembly overview - brake servo/brake master cylinder, left-hand drive vehicles”, page 63](#)
- ◆ Engine control unit ➔ Rep. gr. 24 ; Engine control unit; Assembly overview - engine control unit



2.4.2 Removing and installing brake servo, RHD

Special tools and workshop equipment required

- ◆ Sealing tool - T10249-

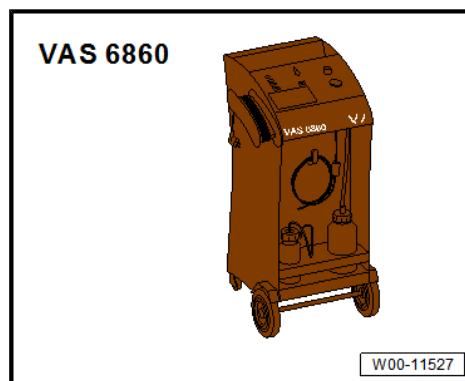


- ◆ Torque wrench - V.A.G 1331-



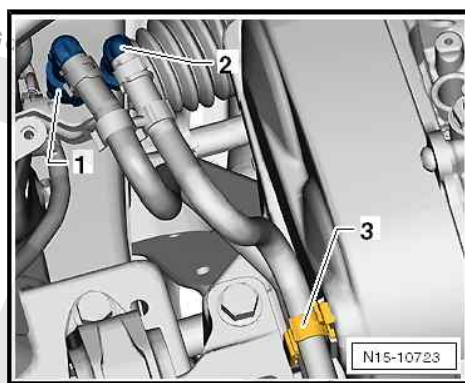


◆ Brake filling and bleeding equipment - VAS 6860-

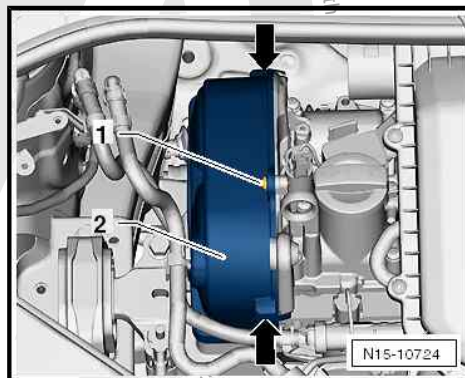


1.0l engine without turbocharger:

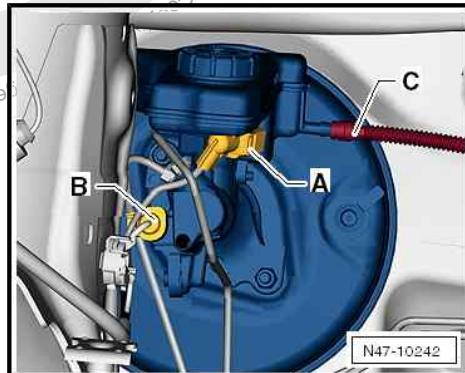
- Remove air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Unclip fuel supply line -1- and breather line -2- from retainer.
- Unhook clips of toothed belt guard -arrows-.



- Unscrew bolt -1- and remove toothed belt guard -2-.
- Place sufficient lint-free cloths in adjacent area.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- .
- Disconnect connector -A- from brake fluid level warning contact - F34- .

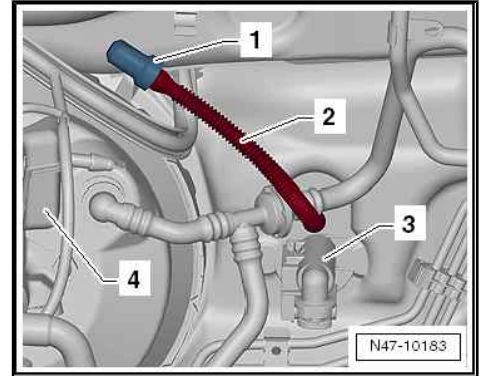


- Pull connector -B- off brake light switch - F- .

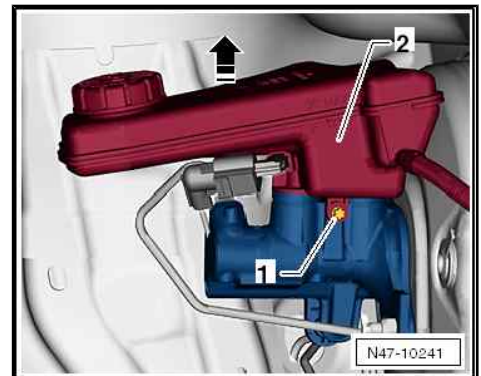




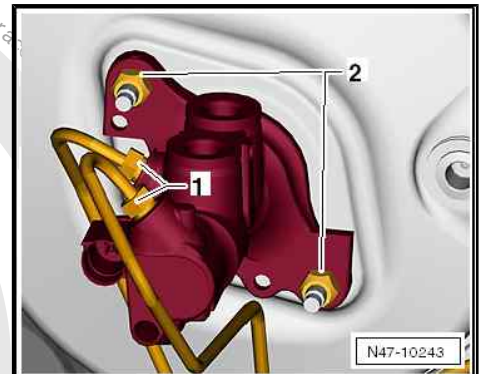
- Disconnect return hose -C- for clutch master cylinder from brake fluid reservoir.
- Seal supply hose -2- for clutch master cylinder -3- with sealing tool - T10249- -1- or engine bung set - VAS 6122- .
- Tie return hose -2- in place above.
- Pull vacuum hose out of brake servo.



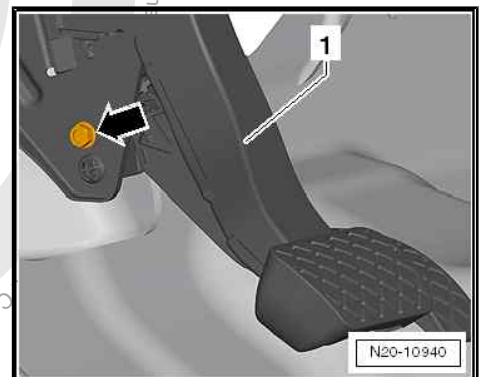
- Unscrew Torx bolt -1- from retaining lug of brake fluid reservoir and from brake master cylinder.
- Pull brake fluid reservoir -2- upwards -arrow- out of brake master cylinder.



- Mark and unscrew brake lines from brake master cylinder -1-.
- Unscrew nuts -2- from brake master cylinder.
- Carefully remove brake master cylinder from brake servo.
- Separate brake pedal from brake servo ➔ [page 53](#) .
- Release connector on accelerator pedal module and pull off.

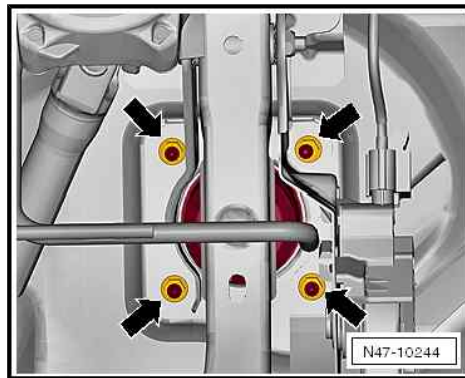


- Unscrew securing bolt -arrow- from brake pedal support.
- Pull accelerator pedal module downwards out of guide.





- Remove hexagon nuts -arrows-.
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Remove bulkhead ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead: Assembly overview - bulkhead .
- Carefully remove brake servo from holes.
- If brake servo sticks in holes, loosen both remaining nuts on mounting bracket.



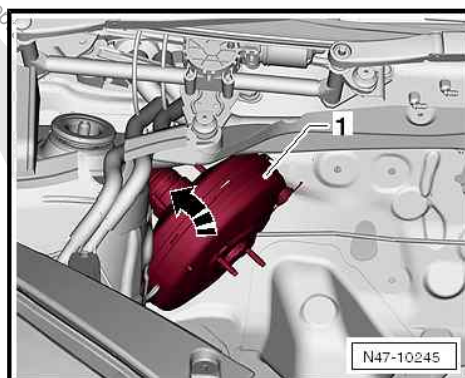
- Then turn brake servo -1- and slide in direction of arrow (push rod leading) into corner under plenum chamber.
- Now take brake servo out upwards.

Installing:

- Install in reverse order.

Observe the following important points when installing:

- Clip brake pedal to brake servo ⇒ [page 54](#) .
- When assembling brake master cylinder with brake servo, make sure plunger rod and seal are properly positioned in brake master cylinder.
- Bleed brake system ⇒ [page 94](#) .



Specified torques

- ♦ ⇒ [“2:1.2 Assembly overview - brake servo/brake master cylinder, right-hand drive”, page 65](#)
- ♦ Accelerator pedal module ⇒ Rep. gr. 20 ; Accelerator mechanism; Assembly overview - accelerator pedal module



3 Vacuum system

⇒ [“3.1 Assembly overview – vacuum pump”, page 81](#)

⇒ [“3.2 Checking non-return valve”, page 82](#)

⇒ [“3.3 Removing and installing brake servo pressure sensor”, page 83](#)

⇒ [“3.4 Removing and installing electrical vacuum pump for brakes”, page 83](#)

⇒ [“3.5 Checking vacuum system”, page 84](#)

3.1 Assembly overview – vacuum pump

⇒ [“3.1.1 Assembly overview - vacuum pump for brakes V192 ”, page 81](#)

3.1.1 Assembly overview - vacuum pump for brakes - V192-

Depending on equipment

Vacuum pump for brakes - V192- is located on the front right-hand side behind the bumper.

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.





1 - Vacuum pump for brakes - V192-

- ☐ Removing and installing
⇒ [page 83](#)

2 - Vacuum line

3 - Brake servo pressure sensor - G294-

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ Removing and installing
⇒ [page 83](#)

4 - Non-return valve

5 - Bracket

6 - Bolt

- ☐ 8 Nm

7 - Bracket

8 - Centre hex stud

- ☐ Specified torque ⇒ Rep. gr. 50 ; Lock carrier; Assembly overview - lock carrier

9 - Hexagon nut

- ☐ 8 Nm

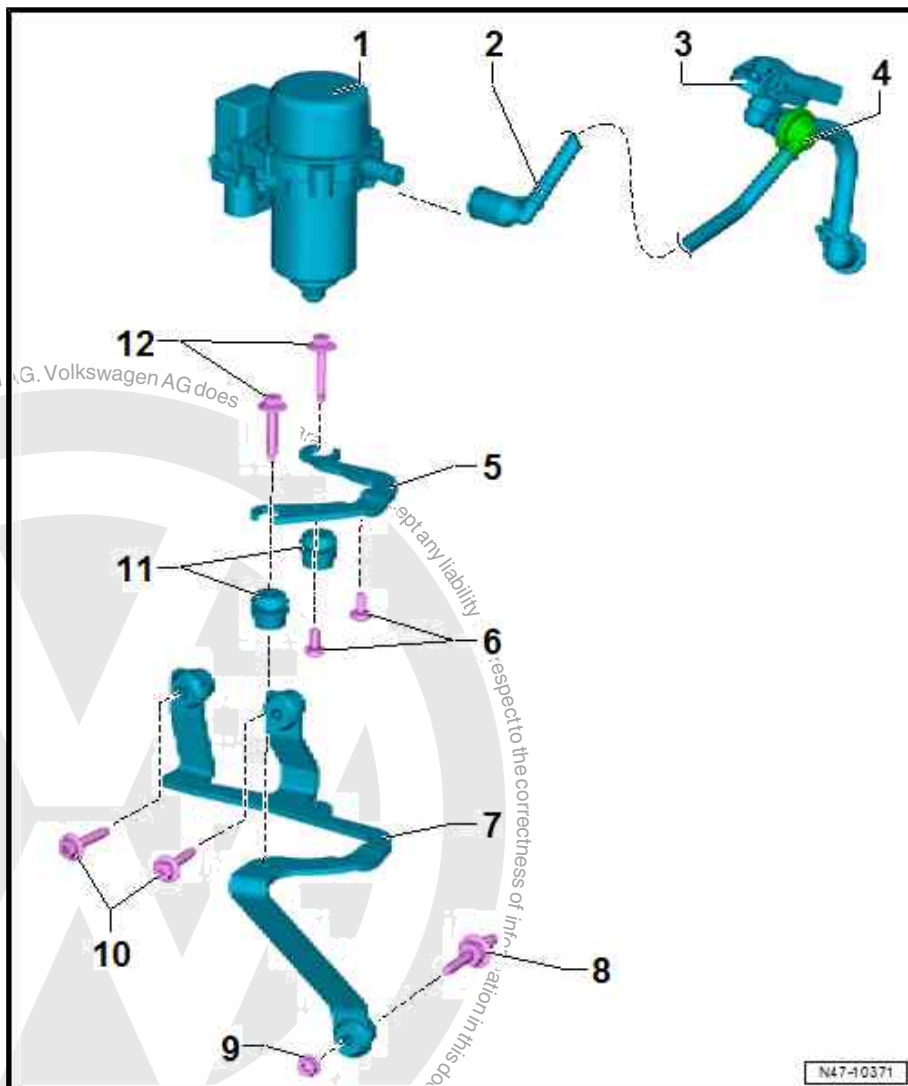
10 - Bolt

- ☐ 8 Nm

11 - Rubber damper

12 - Bolt

- ☐ 8 Nm

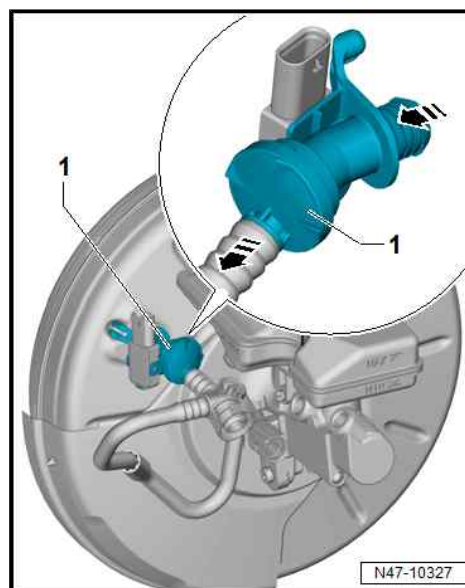


3.2 Checking non-return valve

Installation position of non-return valve -1- in the vacuum hose can vary depending on model.

- ♦ Air must pass through non-return valve -1- in direction of arrow.
- ♦ Non-return valve must remain closed in opposite direction.

Observe correct installation position!





3.3 Removing and installing brake servo pressure sensor

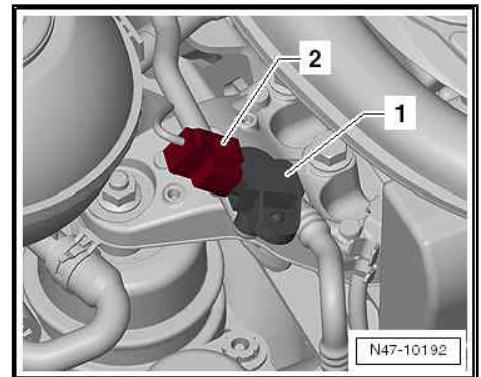
Removing



Note

The vacuum line does not have to be removed.

- Release connector -2- at brake servo pressure sensor - G294- -1- and pull connector off.

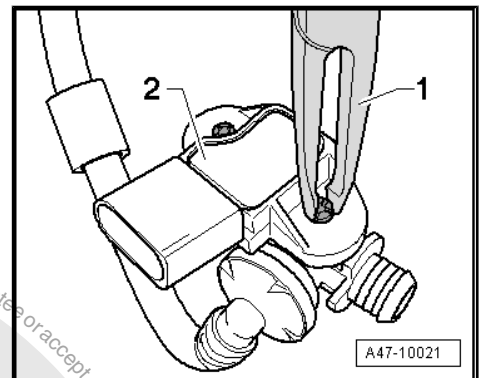


- Release clip with pliers -1-.
- Carefully prise brake servo pressure sensor - G294- -2- off.

Installing

Install in reverse order. During this procedure, observe the following:

- Carefully engage brake booster pressure sensor G294- in vacuum line.



3.4 Removing and installing electrical vacuum pump for brakes

Depending on equipment

Vacuum pump for brakes - V192- is located on the front right-hand side behind the bumper.

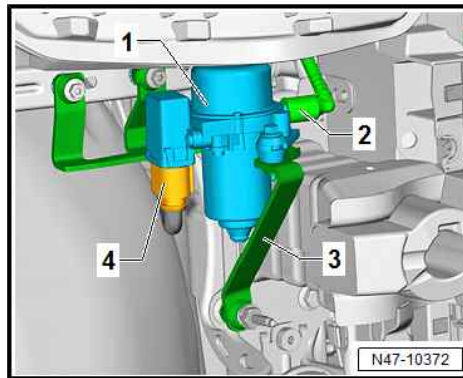
No provision is made for repairs to vacuum pump for brakes - V192- . If a fault occurs, the vacuum pump for brakes - V192- must be renewed.

Removing

- Remove front bumper ➔ Rep. gr. 63 ; Front bumper; Assembly overview - front bumper .



- Release and pull off connector -4- from vacuum pump for brakes - V192- -1-.
- Pull vacuum line -2- off vacuum pump for brakes - V192- -1-.
- Unbolt vacuum pump for brakes - V192- -1- together with bracket -3-.
- Unbolt vacuum pump for brakes - V192- -1- together with second bracket from bracket -3-.



- Put vacuum pump for brakes - V192- -1- together with the bracket -2- in a safe place.
- Remove bolts -arrows- and remove bracket -2- from vacuum pump for brakes - V192- -1-.

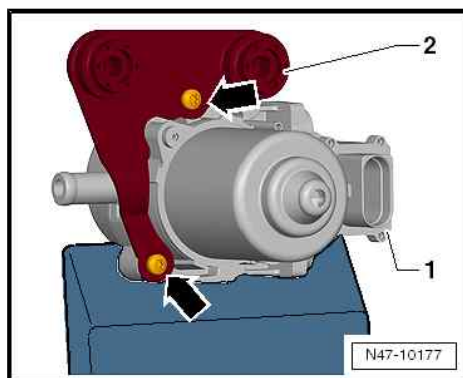
Installing

Install in reverse order. During this procedure, observe the following:

When installing, ensure that rubber dampers are not pressed out of bracket.

Specified torques

- ♦ ➔ [“3.1.1 Assembly overview - vacuum pump for brakes V192”, page 81](#)
- ♦ Front bumper ➔ Rep. gr. 63 ; Front bumper; Assembly overview - front bumper



3.5 Checking vacuum system

The following test instructions are intended to help you find the causes of problems effectively and objectively in the event of complaints about the brake servo or in the event of a so-called »hard brake pedal«.

This check relates to the following components:

- ♦ Brake servo
- ♦ Oil seal between brake master cylinder and brake servo.
- ♦ Non-return valve
- ♦ Vacuum hoses with connectors
- ♦ Vacuum pump (if included)

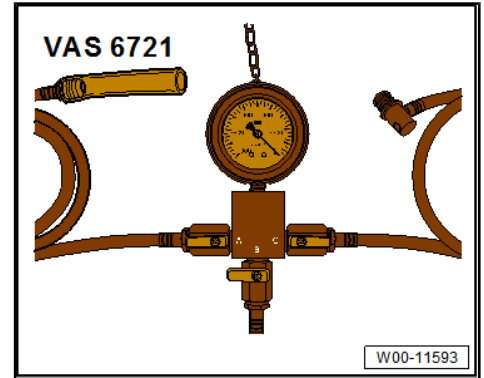
Measuring results will be influenced by the geographical location. The higher the location is above sea level, the lower the air pressure will be.

Take note of the following test requirements:

- ♦ Inspect all vacuum hoses for damage (e.g. cracks or marten bite) and to ensure that they are correctly and firmly attached
- ♦ Ensure cleanliness when working on vacuum system.
- ♦ Before starting work, clean engine compartment if necessary.

Special tools and workshop equipment required

◆ Brake servo tester - VAS 6721-



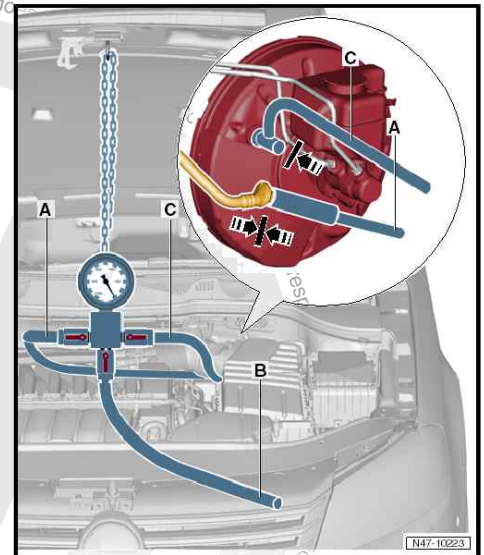
3.5.1 Connecting vacuum gauge for brake servo - VAS 6721-

- Pull vacuum hose out of brake servo.

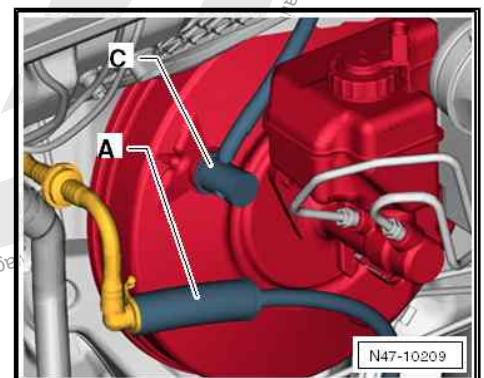
First press the brake pedal several times in order to facilitate removal of the vacuum hose.

- Place brake servo vacuum gauge - VAS 6721- between them -see following illustrations-.

Item number	Component	Explanation
A	Shut-off valve	In direction of vacuum hose, non-return valve and, if fitted, vacuum pump
B	Shut-off valve	<ul style="list-style-type: none"> ◆ Open to facilitate removal of brake servo vacuum gauge - VAS 6721- ◆ Open to simulate a fault source ◆ Connection of manual vacuum pump - VAS 6213-
C	Shut-off valve	In direction of brake servo



- Push hose -A- of brake servo vacuum gauge - VAS 6721- onto vacuum hose and press adapter -C- into brake servo.



3.5.2 Checking vacuum generation



Note

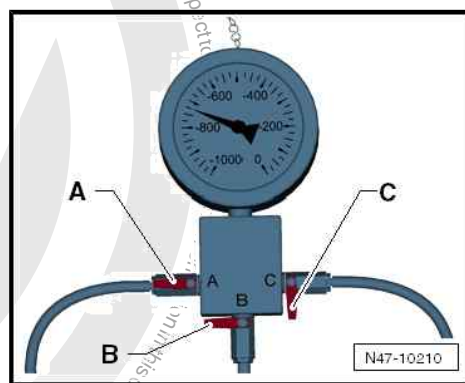
- ◆ *The average air pressure of the earth's atmosphere at sea level is 1013 mbar and decreases steeply as the altitude increases (approx. 100 mbar/1,000 m altitude). Local and time fluctuations also influence vacuum generation.*
- ◆ *A cold engine, a switched-on air-conditioning system as well as engine idling have an adverse influence on generation of a vacuum.*
- Before starting work, check all vacuum hoses for damage (e.g. cracks or marten bite) and to check that they are correctly and firmly attached
- Connect brake servo vacuum gauge - VAS 6721-
⇒ [page 85](#).
- Open cut-off valve -A-.
- Close cut-off valves -B+C-.
- Start warm engine (>60°C), press accelerator briefly (engine speed greater than 2000 rpm).
- Read indicated measured value.

Normally (see notes), the vacuum that is generated should be between 600 and 950 mbar (depending on engine size).

If the measured value is not reached even through the preconditions (see notes) have been met, the vacuum system must first be checked for leaks.

- For comparison purposes, generate the vacuum with the manual vacuum pump - VAS 6213- ⇒ [page 88](#) .

Open cut-off valve -B- to facilitate removal of hose connections and adapter.



3.5.3 Checking for leaks



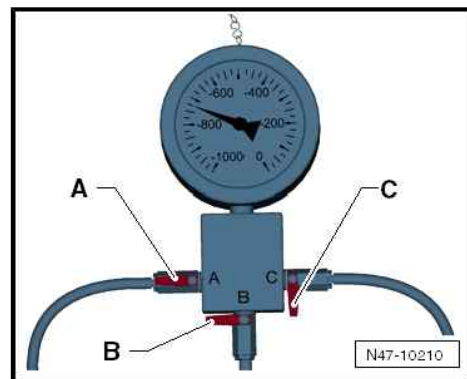
Note

- ◆ *The average air pressure of the earth's atmosphere at sea level is 1013 mbar and decreases steeply as the altitude increases (approx. 100 mbar/1,000 m altitude). Local and time fluctuations also influence vacuum generation.*
- ◆ *A cold engine, a switched-on air-conditioning system as well as engine idling have an adverse influence on generation of a vacuum.*
- Before starting work, check all vacuum hoses for damage (e.g. cracks or marten bite) and to check that they are correctly and firmly attached
- Connect brake servo vacuum gauge - VAS 6721-
⇒ [page 85](#) .
- Open cut-off valve -A-.



- Close cut-off valves -B+C-.
- Start warm engine (>60°C), press accelerator briefly (engine speed greater than 2000 rpm).

Normally (see notes), the vacuum that is generated should be between 600 and 950 mbar (depending on engine size).



- Open cut-off valve -C- to evacuate brake servo.
- Switch off engine.
- Read and make a note of measured value shown.

A vacuum decrease of 400 mbar in 12 hours is permissible.

If the vacuum decrease is greater, check for leaks in the vicinity of ...

- 1 - Brake servo

or

- 2 - non-return valve, vacuum hoses with push-on connections and vacuum pump/intake manifold

if the leak can be found there.

If there are large leaks, the vacuum decreases steeply within a few seconds.

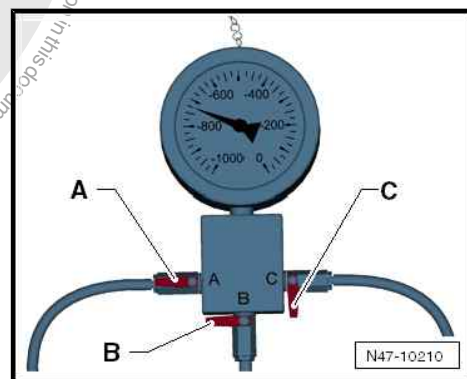
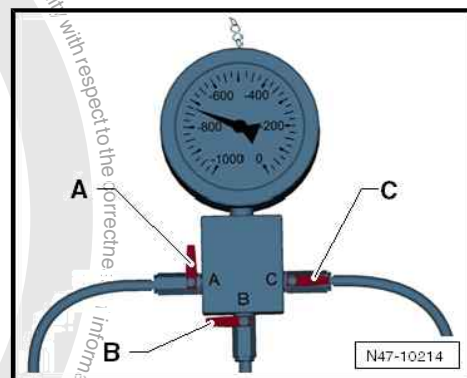
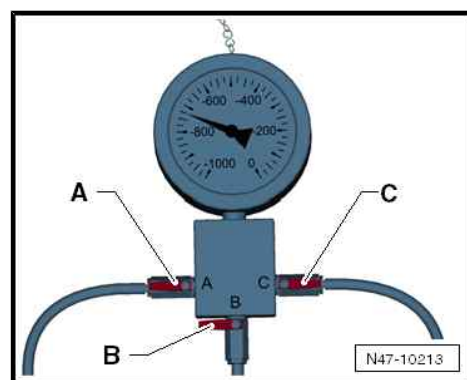
Vacuum check in vicinity of brake servo:

- After generation of vacuum, close cut-off valve -A- in order to check brake servo vacuum system.

Vacuum check in vicinity of non-return valve, vacuum hoses with connectors and vacuum pump/intake manifold:

- Once vacuum pressure has been generated, close shut-off valve -C- in order to check vacuum system from brake servo vacuum gauge - VAS 6721- up to intake manifold or vacuum pump.

Open cut-off valve -B- to facilitate removal of hose connections and adapter.

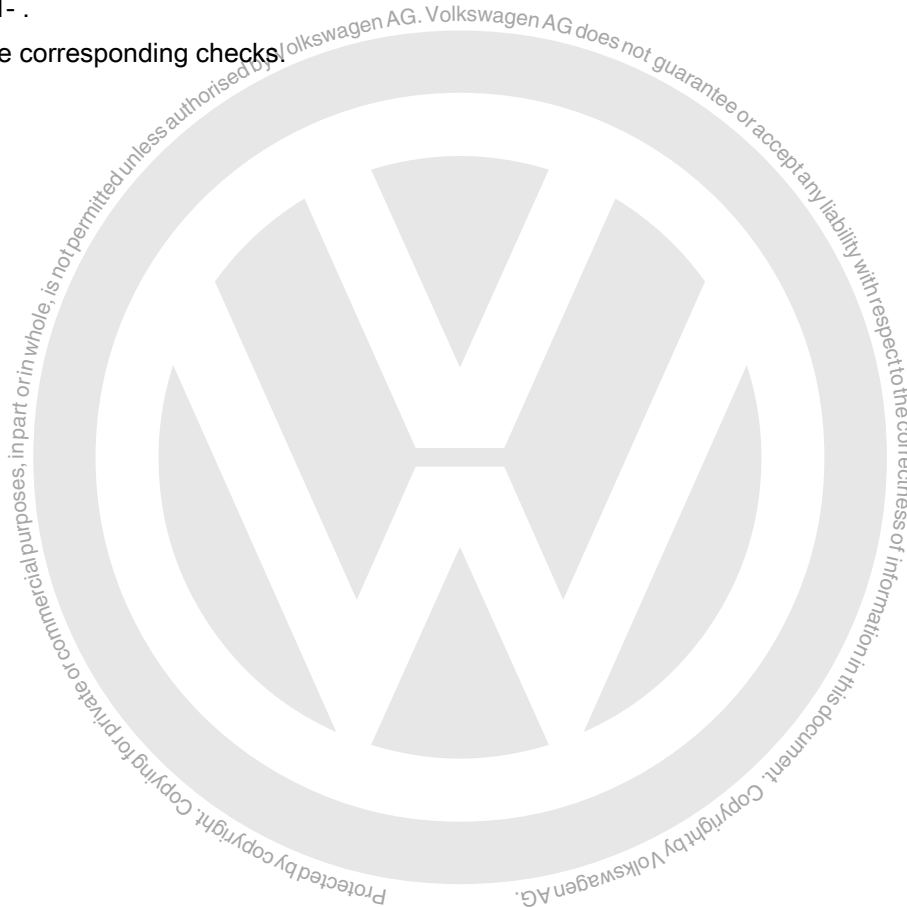
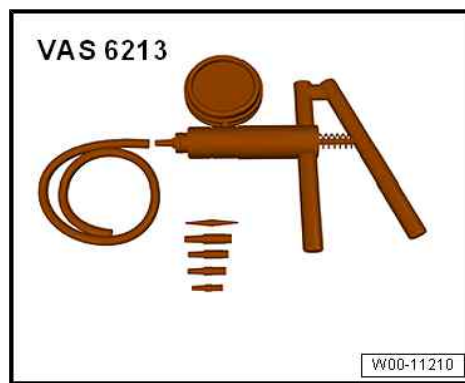




3.5.4 Vacuum generation with manual vacuum pump - VAS 6213-

Instead of vacuum generation by means of engine or vacuum pump, the vacuum can be generated with the manual vacuum pump - VAS 6213- in certain cases.

- To do this, connect manual vacuum pump - VAS 6213- to vacuum hose from connection -B- on brake servo vacuum gauge - VAS 6721- .
- Open cut-off valve -B-.
- Generate vacuum with hand vacuum pump - VAS 6213- until between 600 and 950 mbar is shown on brake servo vacuum gauge - VAS 6721- .
- Then, carry out the corresponding checks.





4 Brake lines

⇒ [“4.1 Repairing brake lines”, page 89](#)

4.1 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 enables partial brake line sections 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

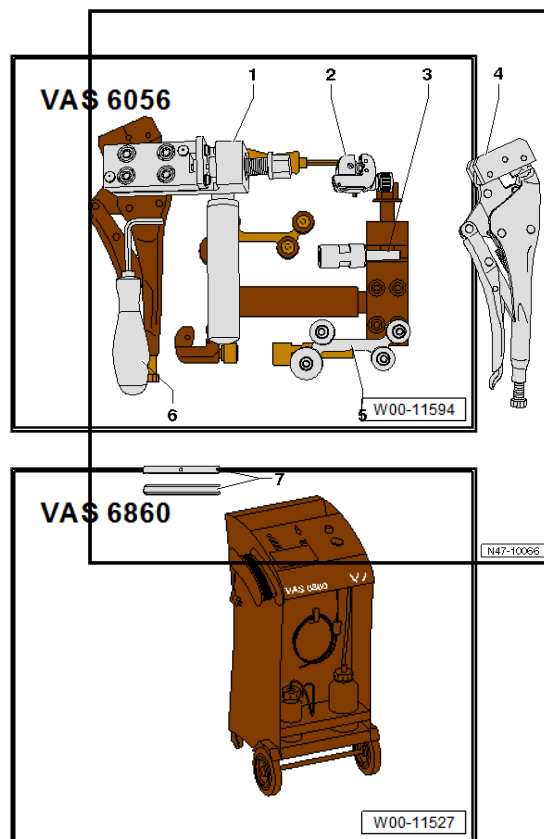
- ◆ *Brake lines may only be bent to max. 90°, as they otherwise kink or reveal deformations which constrict the line cross-section to an impermissible degree.*
- ◆ *Preferably separate brake lines at underbody.*
- ◆ *The positions of the intermediate pieces must be selected so that they cannot chafe 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 6860-



List of individual tools:

Item	Tool	Tool number
1	Flanging tool (including flanging jaws VAS 6056/6)	VAS 6056/1
2	Pipe cutter	VAS 6056/2
3	Brake line scraper ¹⁾	VAS 6056/3
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

1) Grub screws (in shaft and at side) are adjusted and must not be tampered with!

4.1.1 Assembly overview - flanging tool



1 - Flanging tool upper part

- ☐ Unscrew to change flanging jaws.

2 - Fastening for handle

- ☐ Must be unscrewed to access securing bolt for upper part.

3 - Securing bolt

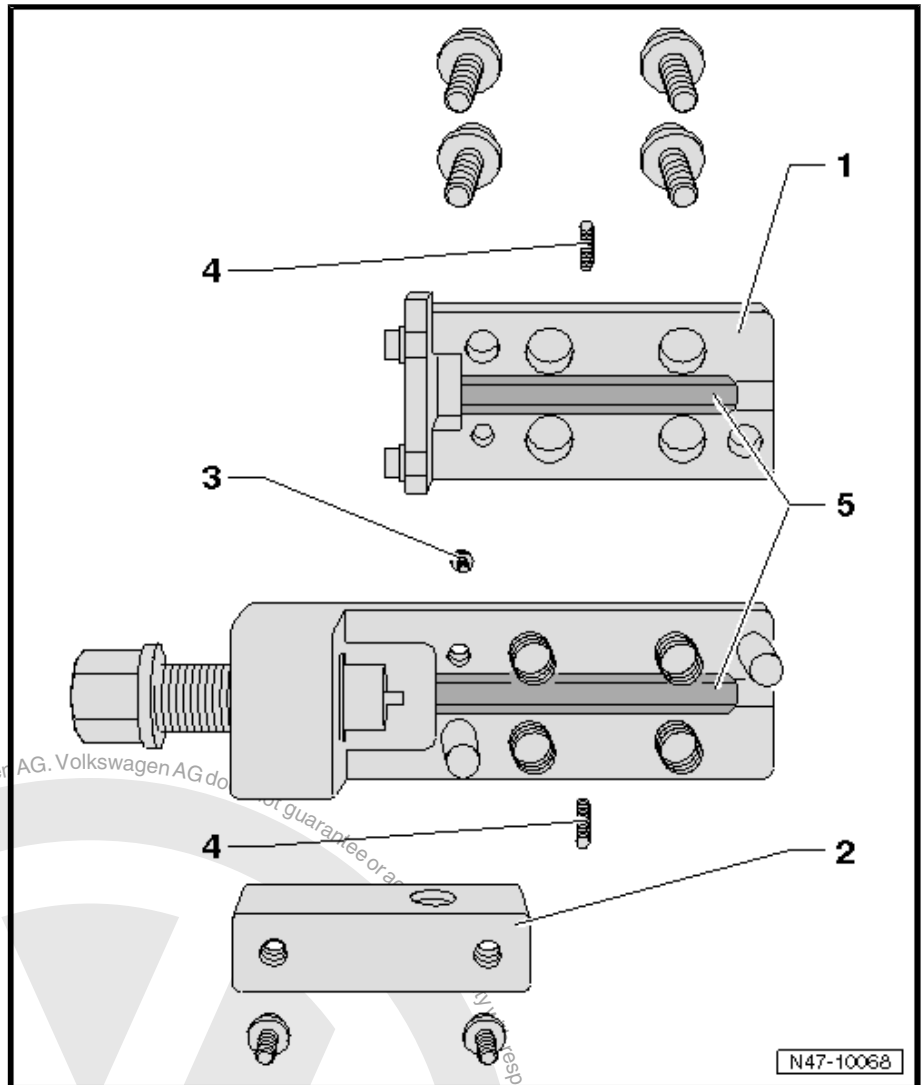
- ☐ For flanging tool upper part

4 - Grub screws for flanging jaws

- ☐ For centring and holding flanging jaws
- ☐ Allen head bolt, 2 mm

5 - Flanging jaws

- ☐ Various.
- ☐ Assembly instructions ➔ [page 91](#).



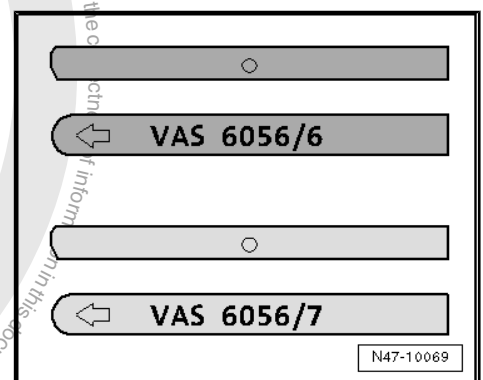
Flanging jaw assembly instructions:

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



Note

Arrow on rounded side of flanging jaws must point to edge of housing, and straight side of flanging jaws must be installed to spindle, as flanging head is not otherwise formed correctly.

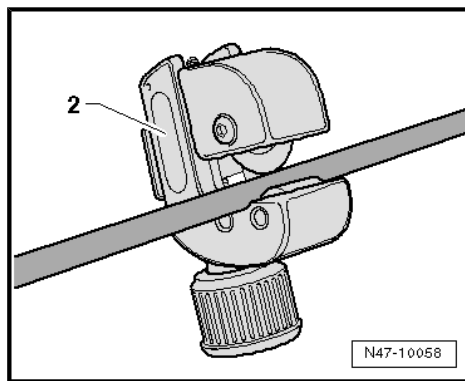


4.1.2 Work instructions

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



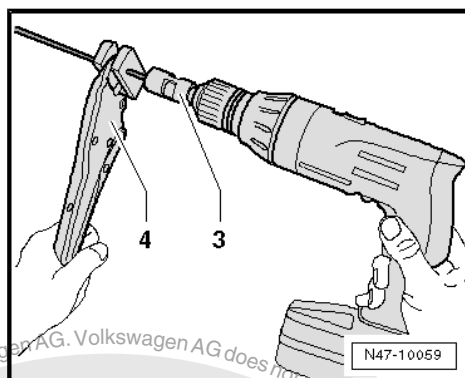
- Cut through brake line at a suitable point (straight, freely accessible section) with pipe cutter -2-.
- Remove section to be renewed.
- Degrease brake line surface.



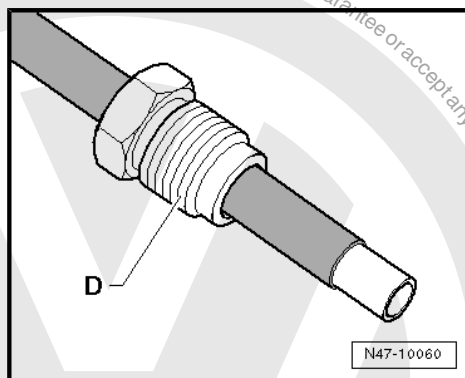
- Clamp brake line tightly in grip wrench -4- so that approx. 50 mm project from plastic jaws.
- Clamp scraper -3- into a drill and position onto brake line.
- At slow drill speed and with gentle pressure on brake line, scrape coating off brake line.

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.



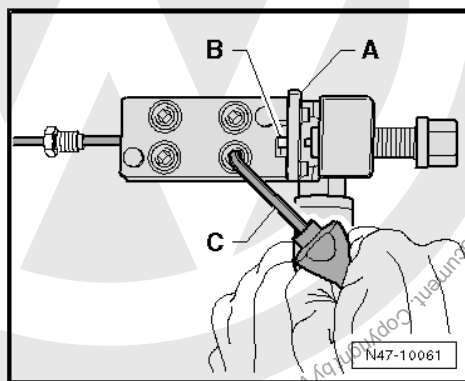
- Slide brake line -B- up to stop -A- in flanging tool.



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 Allen head bolts diagonally using Allen wrench -C-.

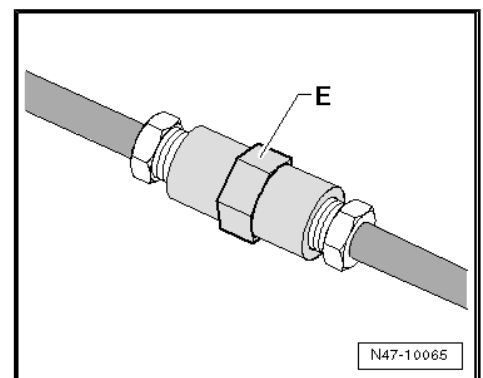
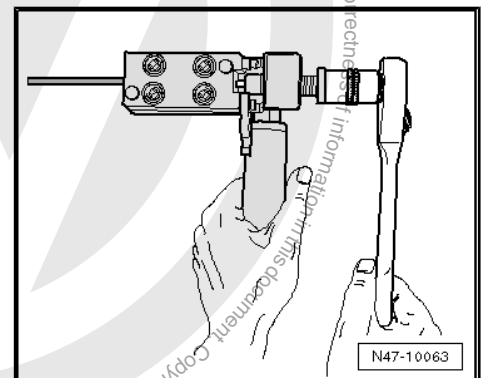
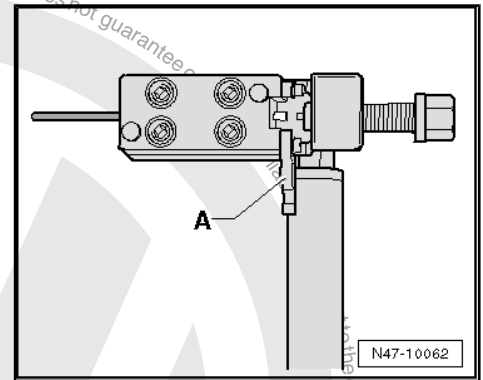




- Turn spindle to stop in flanging tool.
- Turn spindle back again.
- Loosen hexagon socket head bolts diagonally.
- Remove brake line from flanging tool, clean and check brake line and flange.

Briefly flush the section of brake line remaining in the vehicle:

- Connect brake filling and bleeding unit - VAS 6860- , connect bleeder bottle hose to brake line flange and allow brake filling and bleeding unit - VAS 6860- to run briefly until a little of brake fluid has run through.
- Blow out the new brake line to be inserted with compressed air.
- Join brake lines with the connector -E-.
- Install brake line.
- Bleed brake system ⇒ [page 94](#) .





5 Hydraulic system

⇒ **"5.1 General notes on brake fluid", page 94**

⇒ **"5.2 Bleeding hydraulic system following standard procedure", page 94**

⇒ **"5.3 Subsequent bleeding of hydraulic system", page 95**

⇒ **"5.4 Leakage test:", page 97**

5.1 General notes on brake fluid



Note

- ◆ *Only use new brake fluid conforming to VW standard (VW 501 14).*
- ◆ *Brake fluid is poisonous. In addition, due to its corrosive nature, it must not come into contact with paint.*
- ◆ *Brake fluid is hygroscopic, which means it absorbs moisture from the ambient air and should therefore always be stored in air-tight containers.*
- ◆ *Rinse off spilled brake fluid using plenty of water.*

5.1.1 Changing brake fluid

Maintenance Booklet ⇒ Maintenance ; Booklet ; Brake and clutch system: Changing brake fluid

5.2 Bleeding hydraulic system following standard procedure

Bleeding the brake system is described for brake filling and bleeding equipment - VAS 6860- .

An initial pressure of 2 bar is required to bleed the hydraulic unit.

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 6860-

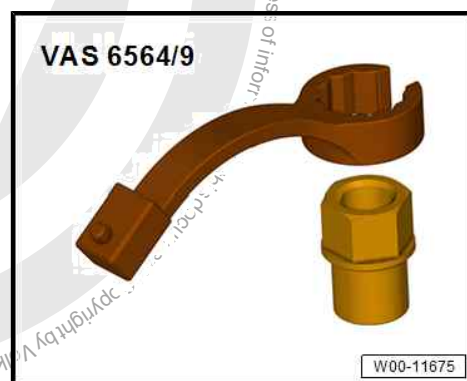




- ◆ Tool set for brake bleeding - VAS 6564-



- ◆ Insert tool - VAS 6564/9-



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 wheel brake cylinders/brake calipers.
 - 1 - Rear right wheel brake cylinder
 - 2 - Rear left wheel brake cylinder
 - 3 - Front right brake caliper
 - 4 - Front left brake caliper

Use suitable bleeder hose. It must sit tightly on bleeder valve so that no air can enter brake system.

- Leave bleeder valve of each brake caliper open with bleeder hose fitted until brake fluid discharges free of air bubbles.

Specified torques:

- ◆ Front bleeder valves
 ⇒ ["1.1.1 Assembly overview - brake caliper FS III", page 57](#)
- ◆ Rear bleeder valves
 ⇒ [Fig. "Wheel brake cylinder", page 44](#)

5.3 Subsequent bleeding of hydraulic system

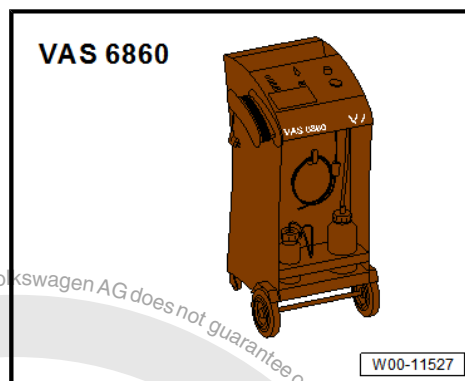
Bleeding the brake system is described for brake filling and bleeding equipment - VAS 6860- .

An initial pressure of 2 bar is required to bleed the hydraulic unit.

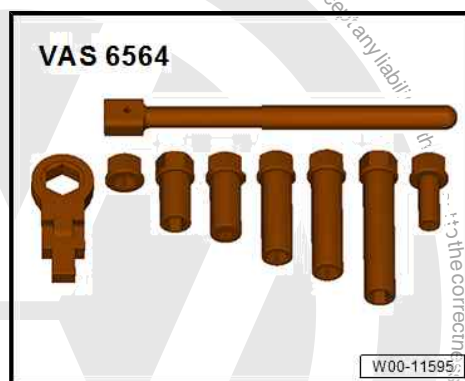
Special tools and workshop equipment required



◆ Brake filling and bleeding equipment - VAS 6860-



◆ Tool set for brake bleeding - VAS 6564-



◆ Insert tool - VAS 6564/9-



Carry out subsequent bleeding when:

- ◆ brake pedal travel is too long or so-called »soft brake pedal«

Subsequent bleeding requires the assistance of a second mechanic.

- Depress brake pedal firmly and hold.
- Open bleeder valve on wheel brake cylinder/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 - Rear right wheel brake cylinder
- 2 - Rear left wheel brake cylinder
- 3 - Front right brake caliper



4 - Front left brake caliper

Specified torques:

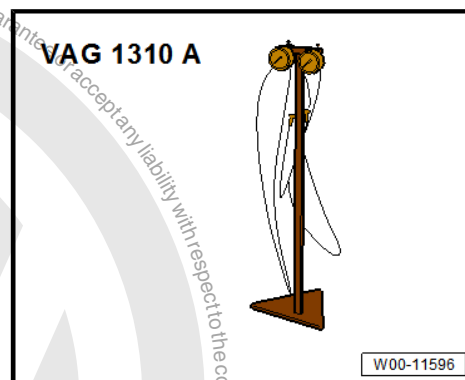
- ◆ Front bleeder valves
⇒ ["1.1.1 Assembly overview - brake caliper FS III", page 57](#)
- ◆ Rear bleeder valves
⇒ [Fig. "Wheel brake cylinder", page 44](#)

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!

5.4 Leakage test:

Special tools and workshop equipment required

- ◆ Tester for brake pressure regulator - V.A.G 1310 A-
- ◆ Adapter M10 - V.A.G 1310/6-



Prerequisites for testing:

Brake system (ABS hydraulic unit - N55- , brake hoses, brake lines and brake calipers) is working properly and is not leaking.

Perform the following steps:

Check

- Remove bleeder valve at one of front brake calipers. Connect tester for brake pressure regulator - V.A.G 1310A- 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 during the test period of 45 seconds. Renew brake master cylinder if drop in pressure exceeds specification.
- Bleed brake system ⇒ [page 94](#) .

Specified torque:

- ◆ Front bleeder valves
⇒ ["1.1.1 Assembly overview - brake caliper FS III", page 57](#)

5.4.1 Checking wheel brake cylinder for leaks

Special tools and workshop equipment required



◆ Removal wedge - 3409-

- Lift off dust boot with removal wedge 3409.
- If brake fluid is found in the dust boot, renew wheel brake cylinder.

Ensure the dust boot is not damaged when lifting off.

