Workshop Manual

e-up! 2014 ➤
e-up! 2017 ➤
e-up! 2020 ➤

Brake system

Edition 10.2019

Service

List of Workshop Manual Repair Groups

Repair Group

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.

D4B8037DB52

Contents

00 – Technical data

1 Safety information

(VRL013515; Edition 10.2019)

⇒ “1.1 Safety precautions when using testers and measuring instruments during a road test”, page 1

⇒ “1.2 Safety precautions when working on high-voltage system”, page 1

⇒ “1.3 Safety precautions when working in the vicinity of high-voltage components”, page 2

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

Risk of injury through insecure 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.

1.2 Safety precautions when working on high-voltage system

Danger to life from high voltage

The high-voltage system is under high voltage. Severe or fatal injury from electric shock.

– Persons with life-preserving or other electronic medical devices in or on their body must not perform any work on the high-voltage system. Such medical devices include internal analgesia pumps, implanted defibrillators, pacemakers, insulin pumps and hearing aids.

– The high-voltage system must be de-energised by a suitably qualified technician.

Risk of injury due to unexpected motor start

It is difficult to determine whether electric or hybrid vehicles have been activated for driving. There is a risk of parts of the body becoming trapped or drawn in.

– Switch off ignition.

– Always store the ignition key outside the vehicle.

Risk of damage to high-voltage cables

Improper handling of high-voltage cables or high-voltage connectors may result in damage to their insulation.

- Never support yourself on high-voltage cables or high-voltage connectors.
- Never support any of your tools on high-voltage cables or high-voltage connectors.
- Never kink or severely bend high-voltage cables.
- Always connect high-voltage connectors according to coding.

1.3 Safety precautions when working in the vicinity of high-voltage components

Danger to life from high voltage

The high-voltage system is under high voltage. If high-voltage components are damaged, there is a risk of severe or fatal injury due to electric shock.

- Carry out visual inspection of high-voltage components and cables.
- Never use cutting or forming tools, or any other sharp-edged tools.
- Never use heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.

2 Identification

⇒ “2.1 Allocation of PR number - brakes”, page 3

2.1 Allocation of PR number - brakes

⇒ “2.1.1 PR number”, page 3

⇒ “2.1.2 Front brakes”, page 3

⇒ “2.1.3 Rear brakes”, page 3

2.1.1 PR number

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

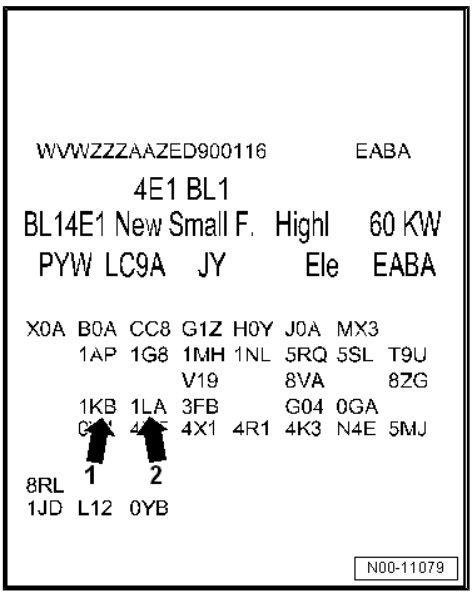
In this example the vehicle is equipped with the following brakes:

- Arrow 1 - Rear brakes - 1KB
- 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)



2.1.2 Front brakes

Engine	PR number	Front brake
Electric drive – 60 kW	1LA	FS III (14")

2.1.3 Rear brakes

Drum brakes

Engine	PR number	Rear brake
Electric drive – 60 kW	1KB	TB 200 X 40

3 Technical data

⇒ “3.1 Technical data for brakes”, page 4

3.1 Technical data for brakes

⇒ “3.1.1 Brake master cylinder and brake servo”, page 4

⇒ “3.1.2 Front brake FS III”, page 4

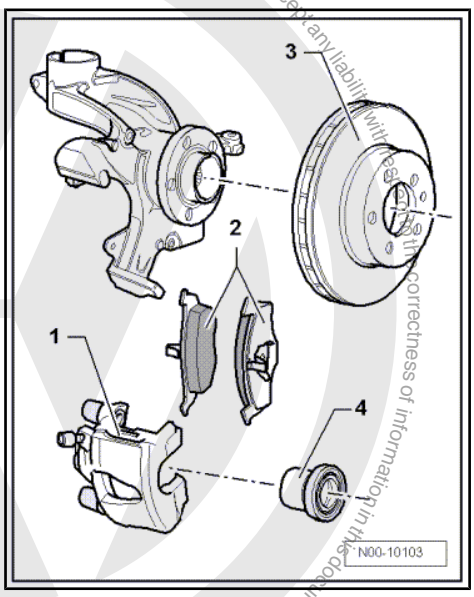
⇒ “3.1.3 Rear brake (drum brake)”, page 4

3.1.1 Brake master cylinder and brake servo

Brake master cylinder	Diameter in mm	20.64
Brake servo	Electric brake servo	

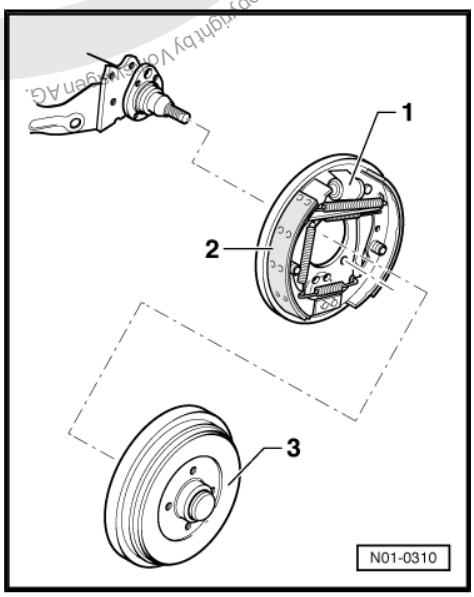
3.1.2 Front brake FS III

Item	PR number		1LA
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



3.1.3 Rear brake (drum brake)

Item	PR number		1KB
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

- The drive is provided by the test rig.
- For vehicles with a manual gearbox, ensure that the gear lever is in neutral before performing the test.
- 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 performed on a single-axle roller dynamometer.

The maximum test speed is 6 km/h.

Use test rigs authorised by Volkswagen.

These test rigs fulfil the requirements.

45 – Anti-lock brake system

1 General information

The ABS brake system is divided diagonally. The electric brake servo is responsible for increasing the brake forces.

Faults in the ABS do not influence the brake system or the brake servo.

The conventional brake system remains functional even without ABS.

A change in braking behaviour is to be reckoned with.

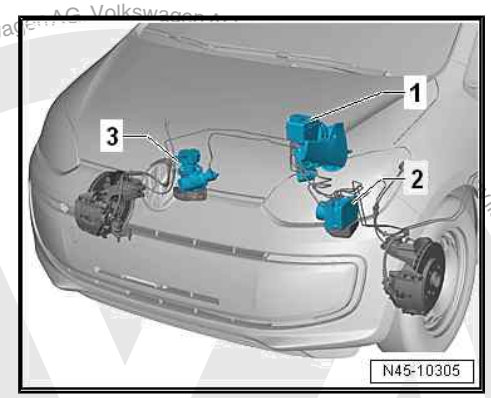
After the ABS warning lamp comes on, the rear wheels may lock prematurely during braking.

Anti-lock braking system on LHD vehicles:

1 - Brake servo

2 - ABS control unit - J104- and ABS hydraulic unit - N55-

3 - Brake system pressure accumulator - VX70-

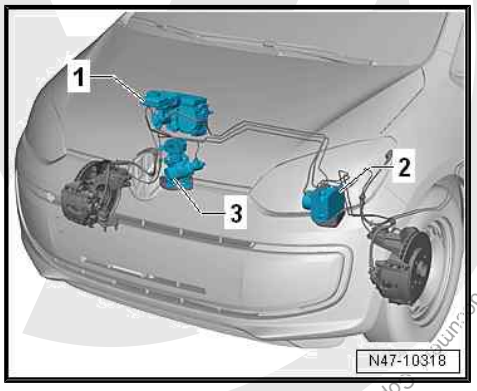


Anti-lock braking system on RHD vehicles:

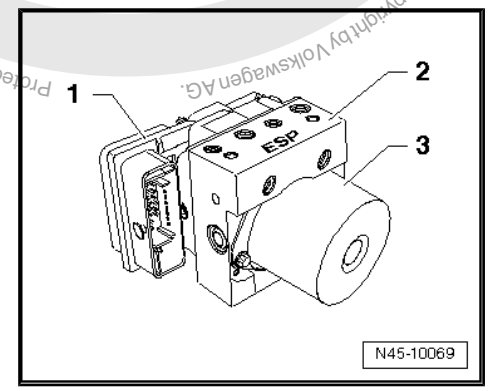
1 - Brake servo

2 - ABS control unit - J104- and ABS hydraulic unit - N55-

3 - Brake system pressure accumulator - VX70-



ABS control unit - J104- -1- and ABS hydraulic unit - N55- -2- are incorporated in one device. Hydraulic pump -3- must not be separated from ABS hydraulic unit - N55- .

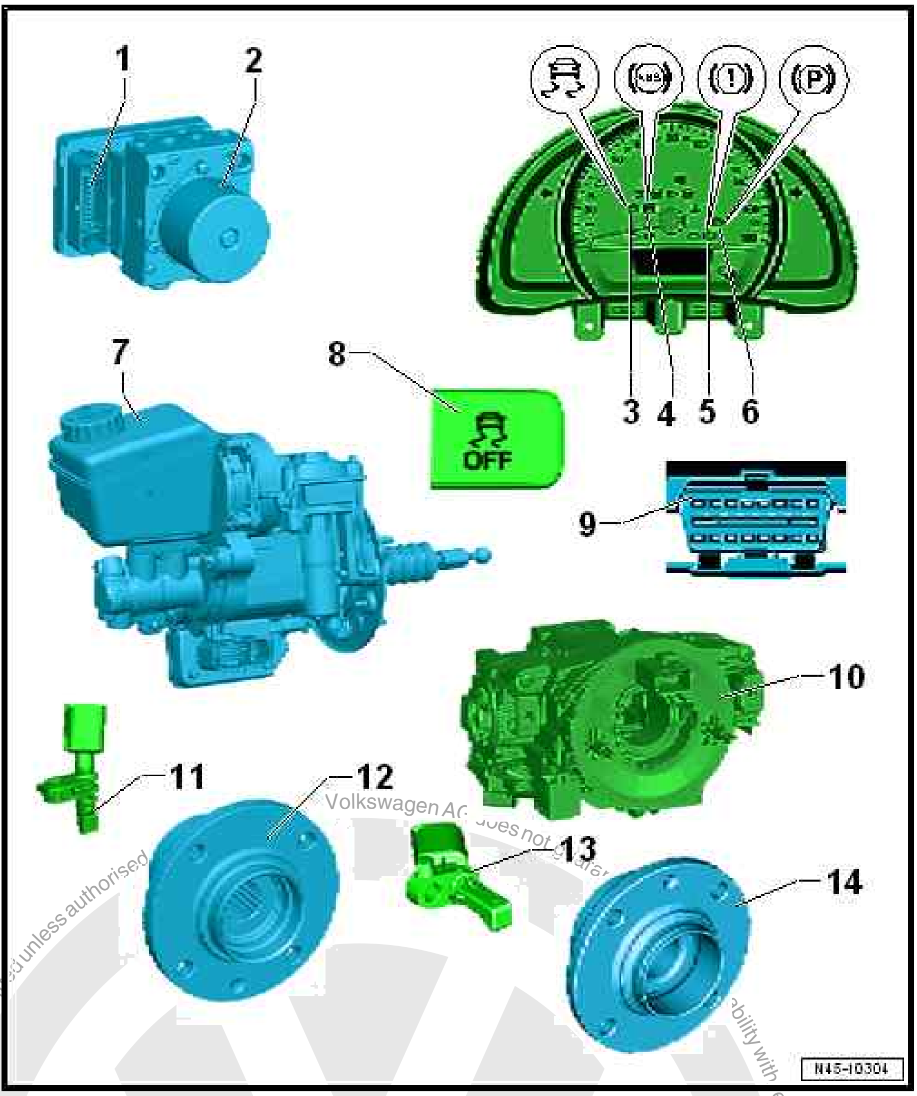


1.1 Repair instructions for repair work on ABS

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

- “Fault finding” is performed with the ⇒ Vehicle diagnostic tester.
- 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 89 .
- After work for which the brake system had to be opened, bleed the brake system with brake filling and bleeding unit - VAS 6860- ⇒ page 89 .
- 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.
- Auxiliary items containing mineral oil, e.g. oils, greases, etc. must never be used.
- 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 the control unit/hydraulic unit, use the transport protection for the contact pins.
- If repair work cannot be performed immediately, cover new parts which have been removed from their packing. (Sealing plugs - 1H0 698 311 A- must be used)
- 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 and do not move the vehicle.
- It is permissible to subject the ABS control unit - J104- to a maximum temperature stress of 95 °C during painting work.
- The ABS control unit - J104- may be submitted to a maximum temperature of 85℃ over an extended period of time (approx. 2 hours).
- Ensure that no brake fluid enters connectors.

2 Overview of fitting locations



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 - Parking brake warning lamp - K139-

- ❑ Location: in dash panel insert.

7 - Brake servo

- ❑ Electric brake servo
- ❑ Assembly overview ⇒ page 57
- ❑ With brake master cylinder
- ❑ Removing and installing brake servo ⇒ page 65
- ❑ Removing and installing brake master cylinder ⇒ page 78
- ❑ Checking ⇒ Vehicle diagnostic tester

The following electrical components are integrated in the brake servo:

- Brake pedal position sender - G100-
- Brake pedal position sender 2 - G836-
- Voltage supply sender 1 - G730-
- Voltage supply sender 2 - G731-
- Brake servo current sensor - G822-
- Brake servo temperature sender 1 - G838-
- Brake servo temperature sender 2 - G839-
- Motor position sender for brake servo - G840-
- Brake servo control unit - J539-
- Electromechanical brake servo motor - V548-

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 30
- ❑ 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 27

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 29

14 - Wheel hub with wheel bearing

- ❑ ABS sensor ring is installed in wheel bearing.

3 Control unit and hydraulic unit

⇒ “3.1 Assembly overview”, page 10

⇒ “3.2 Removing and installing control unit and hydraulic unit”, page 13

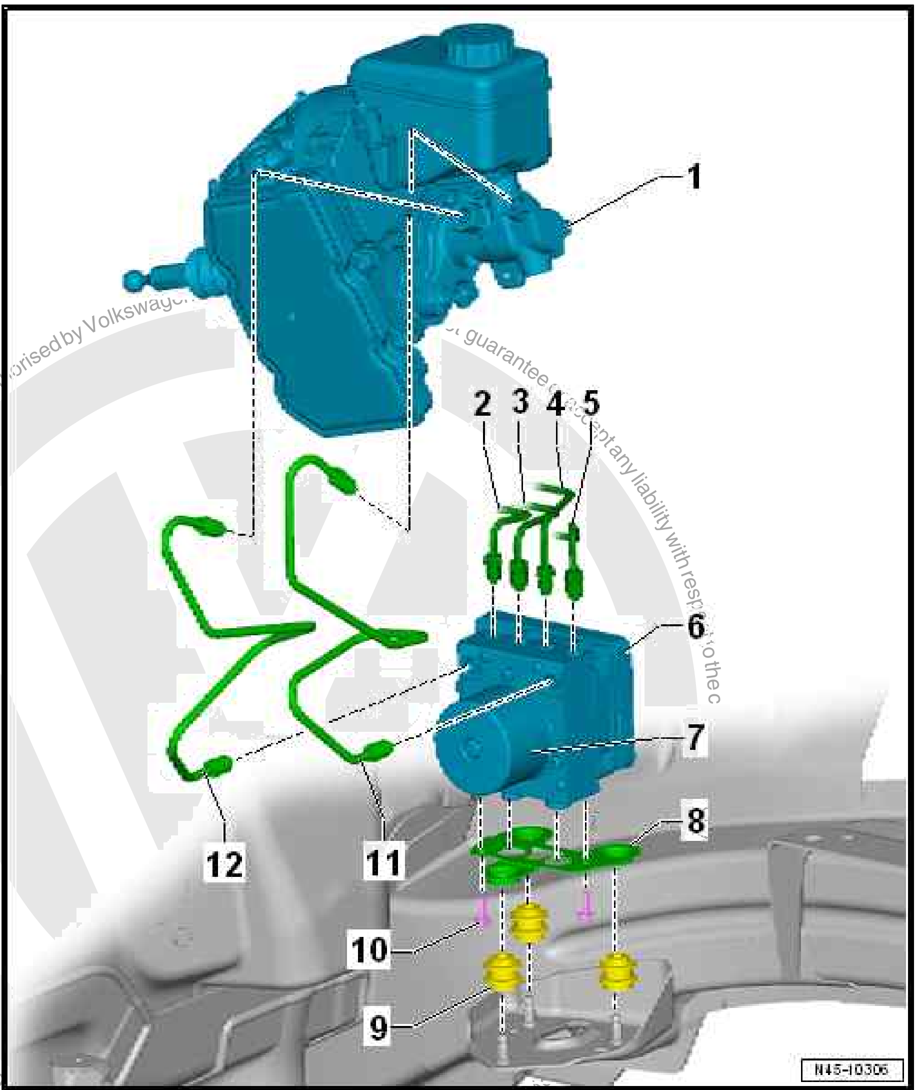
⇒ “3.3 Connecting brake lines to hydraulic unit”, page 24

3.1 Assembly overview

⇒ “3.1.1 Assembly overview – LHD vehicles”, page 10

⇒ “3.1.2 Assembly overview – RHD vehicles”, page 12

3.1.1 Assembly overview – LHD vehicles



1 - Brake servo

- ❑ Electric brake servo
- ❑ Assembly overview ⇒ page 57
- ❑ With brake master cylinder
- ❑ Removing and installing brake servo ⇒ page 65
- ❑ Removing and installing brake master cylinder ⇒ page 78
- ❑ Checking ⇒ Vehicle diagnostic tester

The following electrical components are integrated in the brake servo:

- ♦ Brake pedal position sender - G100-
- ♦ Brake pedal position sender 2 - G836-
- ♦ Voltage supply sender 1 - G730-
- ♦ Voltage supply sender 2 - G731-
- ♦ Brake servo current sensor - G822-
- ♦ Brake servo temperature sender 1 - G838-
- ♦ Brake servo temperature sender 2 - G839-
- ♦ Motor position sender for brake servo - G840-
- ♦ Brake servo control unit - J539-
- ♦ Electromechanical brake servo motor - V548-

2 - Brake line

- ❑ To front right brake caliper
- ❑ Marked on hydraulic unit with »FR«
- ❑ With thread M10 x 1
- ❑ 14 Nm

3 - Brake line

- ❑ To rear left wheel brake cylinder
- ❑ Marked on hydraulic unit with »RL«
- ❑ With thread M12 x 1
- ❑ 14 Nm

4 - Brake line

- ❑ To rear right wheel brake cylinder
- ❑ Marked on hydraulic unit with »RR«
- ❑ With thread M10 x 1
- ❑ 14 Nm

5 - Brake line

- ❑ To front left brake caliper
- ❑ Marked on hydraulic unit with »FL«
- ❑ 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

- ❑ Ensure that rubber dampers of retainer are not pressed out of bracket when installing. After installation, check that the ABS hydraulic unit - N55- is firmly seated, or malfunction can occur.

10 - Bolt

- ❑ 8 Nm

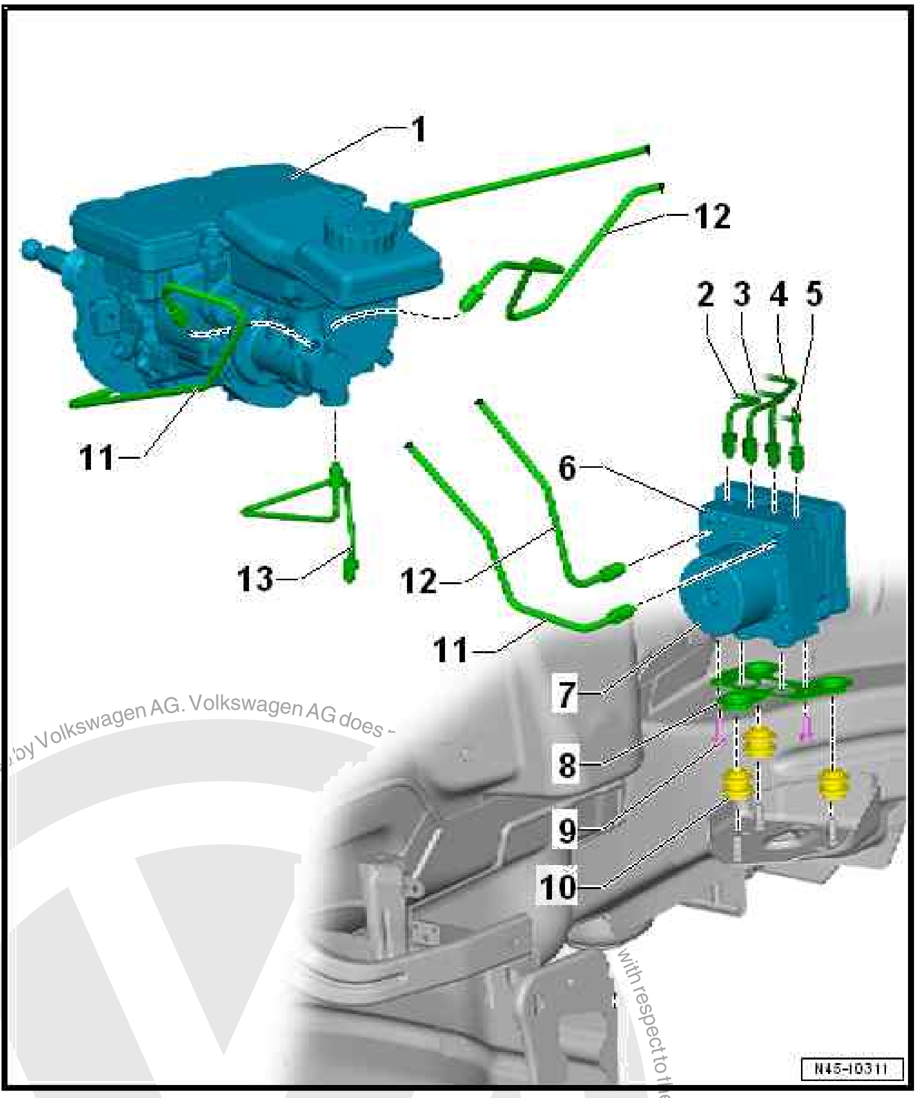
11 - Brake line

- ❑ Brake master cylinder/secondary piston circuit to hydraulic unit
- ❑ Marked on hydraulic unit with -HZ1-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

12 - Brake line

- ❑ Brake master cylinder/primary piston circuit to hydraulic unit
- ❑ Marked on hydraulic unit with -HZ2-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

3.1.2 Assembly overview – RHD vehicles



1 - Brake servo

- ❑ Electric brake servo
- ❑ Assembly overview ⇒ page 57
- ❑ With brake master cylinder
- ❑ Removing and installing brake servo ⇒ page 65
- ❑ Removing and installing brake master cylinder ⇒ page 78
- ❑ Checking ⇒ Vehicle diagnostic tester

The following electrical components are integrated in the brake servo:

- ♦ Brake pedal position sender - G100-
- ♦ Brake pedal position sender 2 - G836-
- ♦ Voltage supply sender 1 - G730-
- ♦ Voltage supply sender 2 - G731-
- ♦ Brake servo current sensor - G822-
- ♦ Brake servo temperature sender 1 - G838-
- ♦ Brake servo temperature sender 2 - G839-
- ♦ Motor position sender for brake servo - G840-
- ♦ Brake servo control unit - J539-
- ♦ Electromechanical brake servo motor - V548-

2 - Brake line

- ❑ To front right brake caliper
- ❑ Marked on hydraulic unit with »FR«
- ❑ With thread M10 x 1
- ❑ 14 Nm

3 - Brake line

- ❑ To rear left wheel brake cylinder
- ❑ Marked on hydraulic unit with »RL«
- ❑ With thread M12 x 1
- ❑ 14 Nm

4 - Brake line

- ❑ To rear right wheel brake cylinder
- ❑ Marked on hydraulic unit with »RR«
- ❑ With thread M10 x 1
- ❑ 14 Nm

5 - Brake line

- ❑ To front left brake caliper
- ❑ Marked on hydraulic unit with »FL«
- ❑ 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

- ❑ Ensure that rubber dampers of retainer are not pressed out of bracket when installing. After installation, check that the ABS hydraulic unit - N55- is firmly seated, or malfunction can occur.

10 - Bolt

- ❑ 8 Nm

11 - Brake line

- ❑ Brake master cylinder/secondary piston circuit to hydraulic unit
- ❑ Marked on hydraulic unit with -HZ1-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

12 - Brake line

- ❑ Brake master cylinder/primary piston circuit to hydraulic unit
- ❑ Marked on hydraulic unit with -HZ2-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

3.2 Removing and installing control unit and hydraulic unit

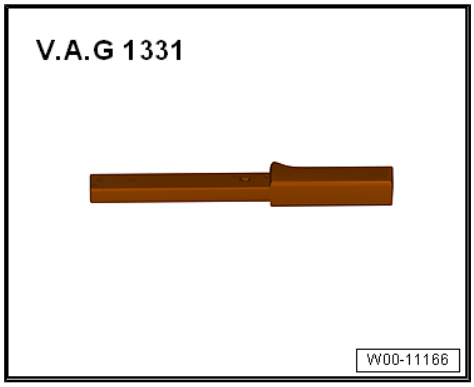
⇒ “3.2.1 Removing and installing control unit and hydraulic unit, LHD”, page 13

⇒ “3.2.2 Removing and installing control unit and hydraulic unit, right-hand drive”, page 19

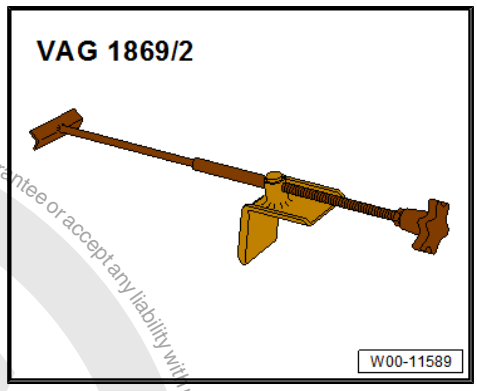
3.2.1 Removing and installing control unit and hydraulic unit, LHD

Special tools and workshop equipment required

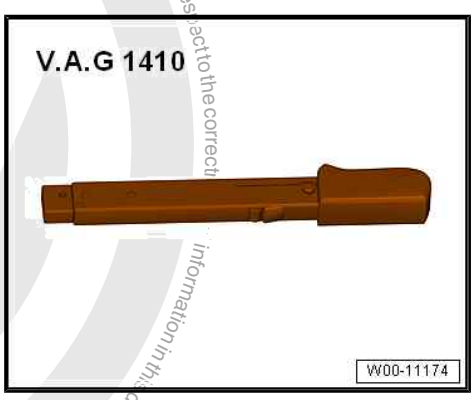
- Torque wrench - V.A.G 1331-



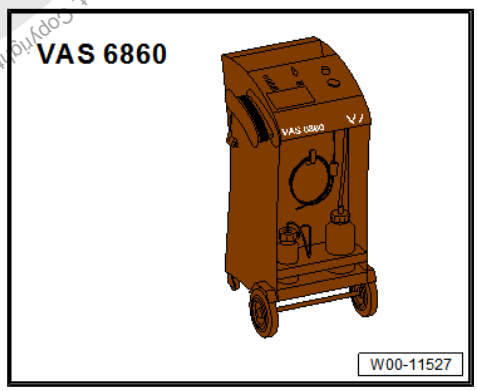
- Brake pedal depressor - V.A.G 1869/2-



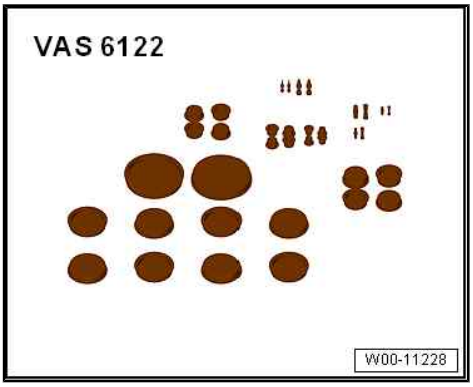
- Torque wrench - V.A.G 1410-



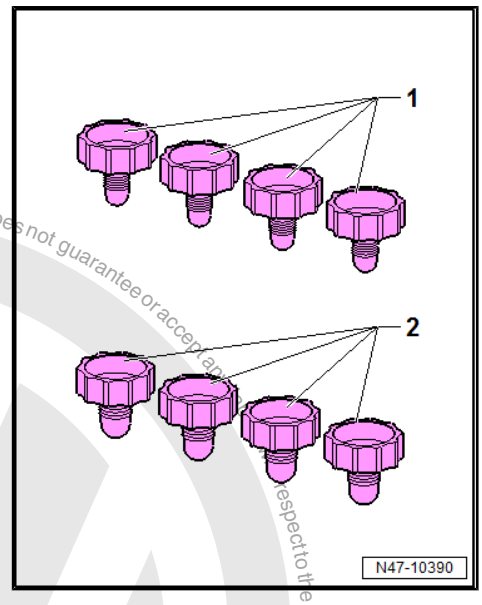
- Ring spanner insert set AF 11 - V.A.G 1331/2-
- Brake filling and bleeding equipment - VAS 6860-



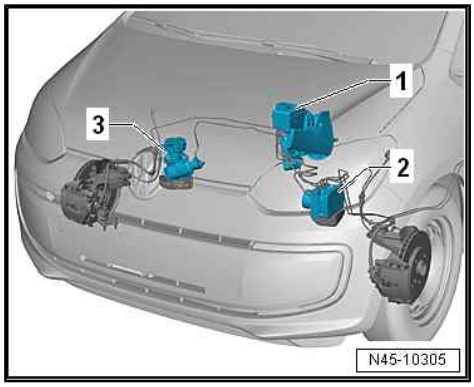
- Engine bung set - VAS 6122-



- Sealing plug repair kit - 1H0 698 311 A-



Locations:



1 - Brake servo

2 - ABS hydraulic unit - N55- and ABS control unit - J104-

3 - Brake system pressure accumulator - VX70-

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

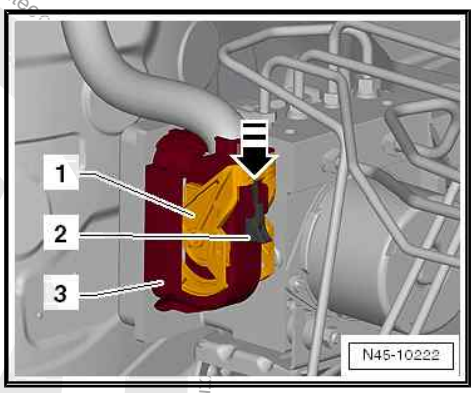
Removing:

NOTICE

Risk of damage to brake lines if bent.

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

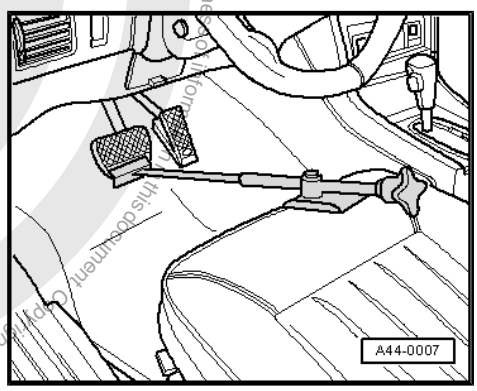
- Read out and make a note of the code of ABS control unit - J104- .
- Note or request radio code on vehicles with coded radio if necessary.
- Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .
- Press locking slide -2- downwards in -direction of arrow-.
- Then, press locking bar -1- downwards (direction of -arrow-) to release connector -3-.



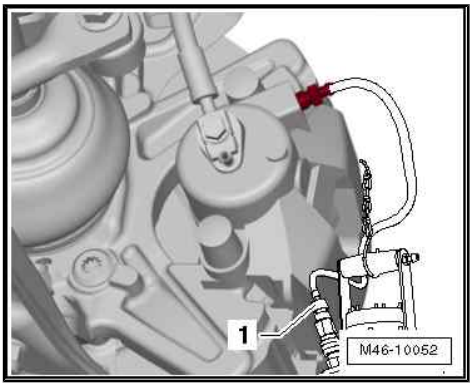
Ensure no brake fluid gets onto contacts.

- 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- .
– Lay out sufficient lint free clothes in area of engine and gearbox.
– Place sufficiently lint-free cloths under ABS control unit - J104- and ABS hydraulic unit - N55- .
– Place sufficient lint-free cloths under brake servo and in area of subframe.

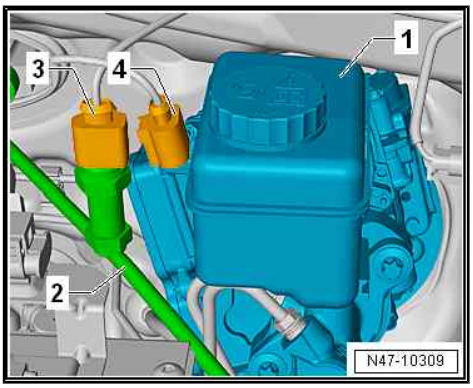


Vehicles with air conditioner:

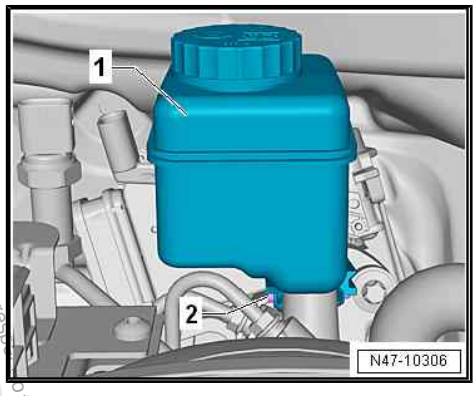
– Release and disconnect connector -3- for high-pressure sender - G65- from refrigerant line -2-.

Continued for all vehicles:

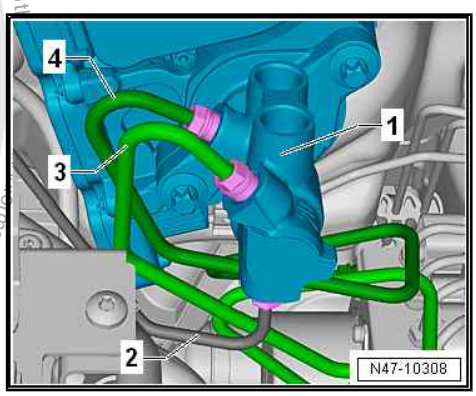
– Release and disconnect connector -4- for brake fluid level warning contact - F34- from brake fluid reservoir.



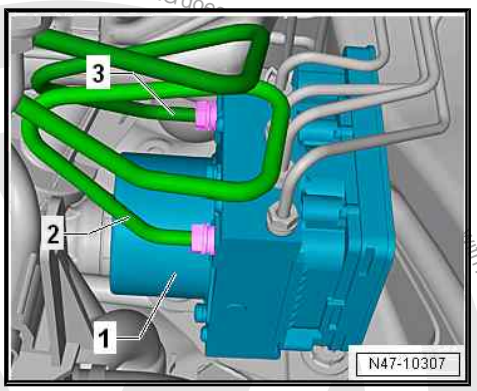
– Unscrew bolt -2-, and carefully pull off brake fluid reservoir -1- upwards.
– Immediately seal open connections with suitable plugs from engine bung set - VAS 6122- .



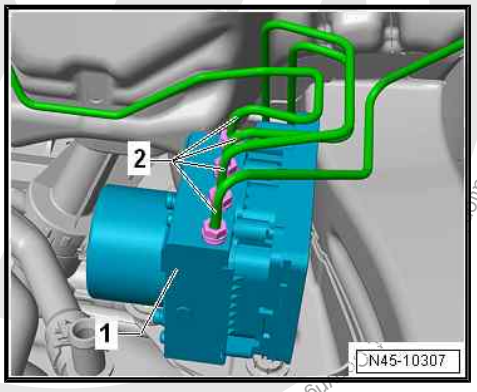
– Mark position of brake lines -2- to -4- on brake master cylinder -1-.
– Unscrew brake lines -2- to -4- from brake master cylinder -1-.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



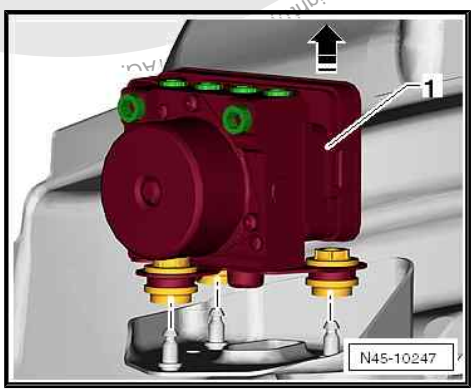
– Mark position of brake lines -2- and -3- on ABS hydraulic unit - N55- -1-.
– Unscrew brake lines -2- and -3- from ABS hydraulic unit - N55- -1-.
– Remove brake lines from vehicle.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



– Mark position of brake lines -2- on ABS hydraulic unit - N55- -1-.
– Unscrew brake lines -2- from ABS hydraulic unit - N55- -1-.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



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



Installing:

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

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.*
- *Ensure that rubber dampers of retainer are not pressed out of bracket when installing. After installation, check that the ABS hydraulic unit - N55- is firmly seated, or malfunction can occur.*

– Remove brake pedal actuator - V.A.G 1869/2- .
– Bleed brake system ⇒ page 89 .
– Code ABS control unit - J104- using ⇒ Vehicle diagnostic tester.
– Code radio.

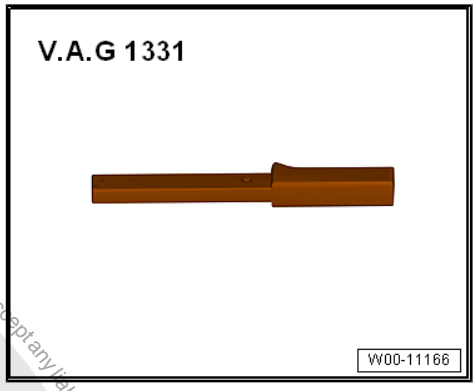
Specified torques:

- ⇒ “3.1 Assembly overview”, page 10
- ⇒ “2.1 Assembly overview - brake servo/brake master cylinder”, page 57
- ⇒ “3.3 Connecting brake lines to hydraulic unit”, page 24

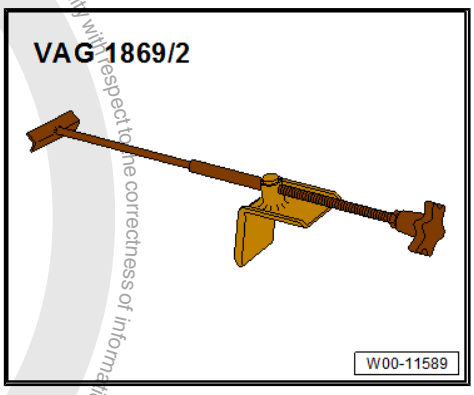
3.2.2 Removing and installing control unit and hydraulic unit, right-hand drive

Special tools and workshop equipment required

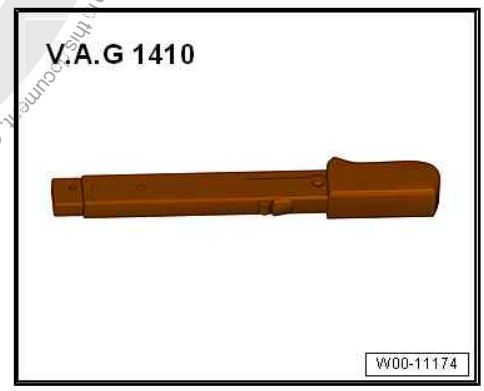
- Torque wrench - V.A.G 1331-



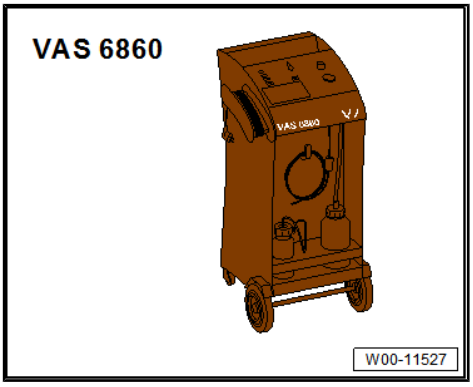
- Brake pedal depressor - V.A.G 1869/2-



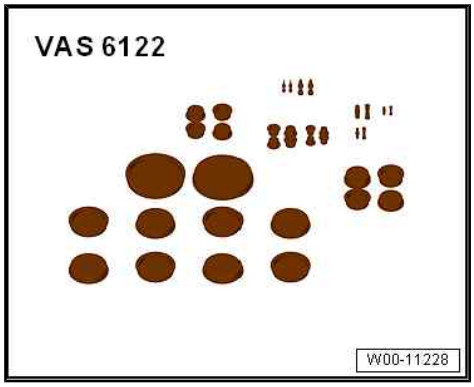
- Torque wrench - V.A.G 1410-



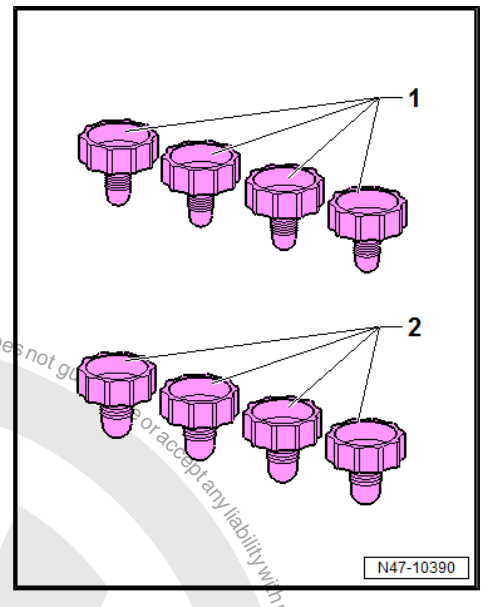
- Ring spanner insert set AF 11 - V.A.G 1331/2-
- Brake filling and bleeding equipment - VAS 6860-



- Engine bung set - VAS 6122-



- Sealing plug repair kit - 1H0 698 311 A-



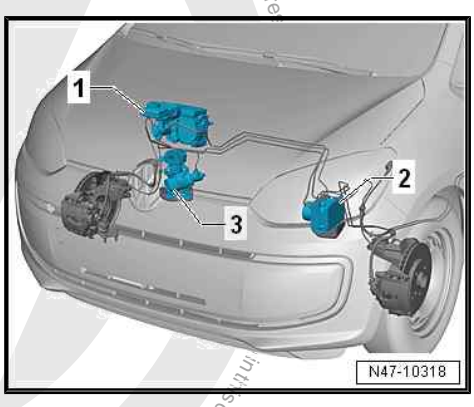
Locations:

1 - Brake servo

2 - ABS control unit - J104- and ABS hydraulic unit - N55-

3 - Brake system pressure accumulator - VX70-

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



Removing:

– Read out and make a note of the code of ABS control unit - J104- .

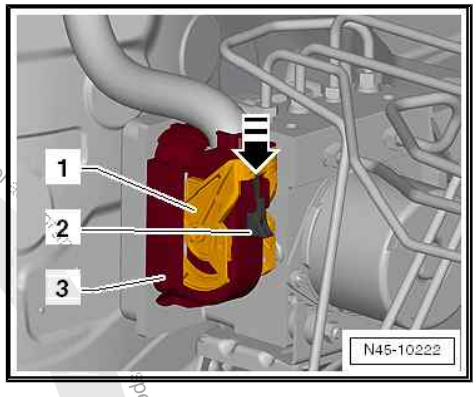
– Note or request radio code on vehicles with coded radio if necessary.

– Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

– Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .

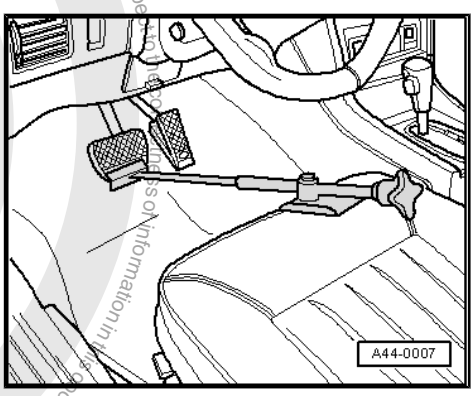
– Press locking slide -2- downwards in -direction of arrow-.
– Then, press locking bar -1- downwards (direction of -arrow-) to release connector -3-.



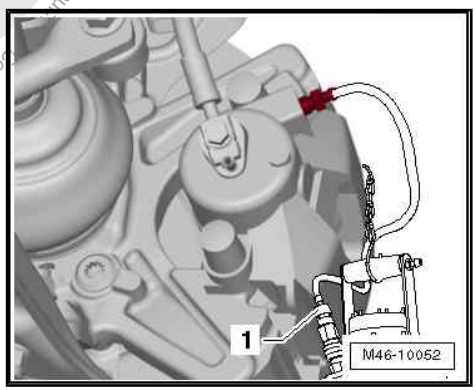
Ensure no brake fluid gets onto contacts.

– 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- .
– Lay out sufficient lint free clothes in area of engine and gearbox.
– Place sufficiently lint-free cloths under ABS control unit - J104- and ABS hydraulic unit - N55- .
– Place sufficient lint-free cloths under brake servo and in area of subframe.

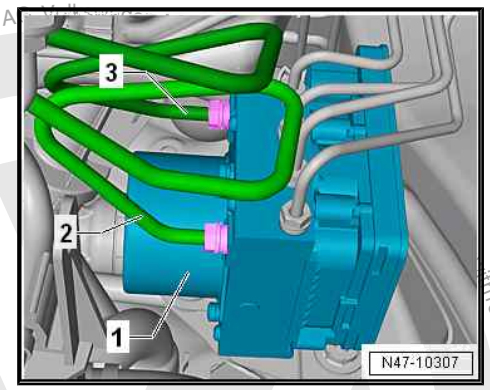


NOTICE

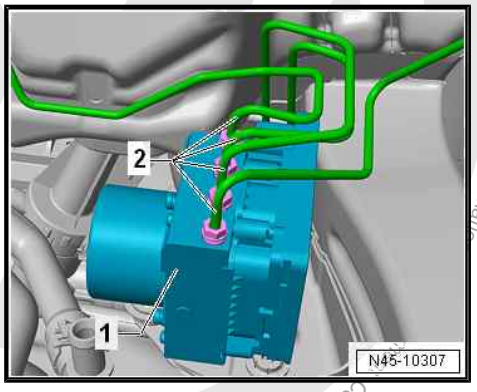
Risk of damage to brake lines if bent.

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

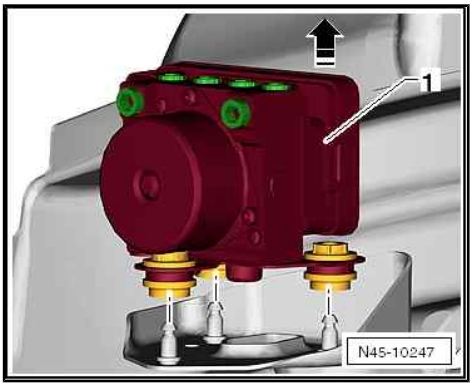
– Mark position of brake lines -2- and -3- on ABS hydraulic unit - N55- -1-.
– Unscrew brake lines -2- and -3- from ABS hydraulic unit - N55- -1-.
– Remove brake lines from vehicle.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



– Mark position of brake lines -2- on ABS hydraulic unit - N55- -1-.
– Unscrew brake lines -2- from ABS hydraulic unit - N55- -1-.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



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



Installing:

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

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.*
- *Ensure that rubber dampers of retainer are not pressed out of bracket when installing. After installation, check that the ABS hydraulic unit - N55- is firmly seated, or malfunction can occur.*

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

– Bleed brake system ⇒ page 89 .

– Code ABS control unit - J104- using ⇒ Vehicle diagnostic tester.

– Code radio.

Specified torques:

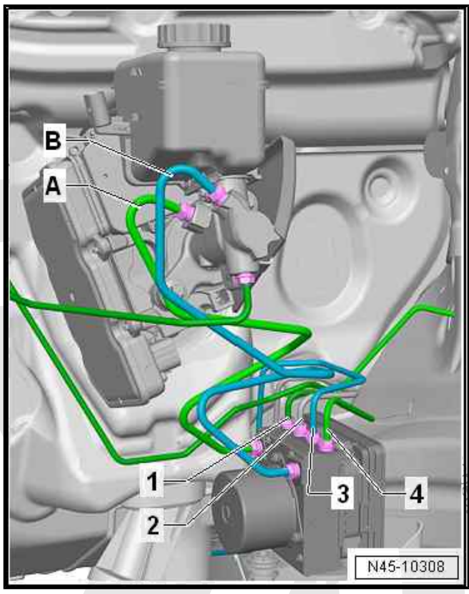
- ⇒ “3.1 Assembly overview”, page 10
- ⇒ “2.1 Assembly overview - brake servo/brake master cylinder”, page 57
- ⇒ “3.3 Connecting brake lines to hydraulic unit”, page 24
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray

3.3 Connecting brake lines to hydraulic unit

⇒ “3.3.1 Connecting brake lines to hydraulic unit, LHD”, page 24

⇒ “3.3.2 Connecting brake lines to hydraulic unit, RHD”, page 25

3.3.1 Connecting brake lines to hydraulic unit, LHD



A - Primary piston circuit of brake master cylinder to ABS hydraulic unit - N55- .

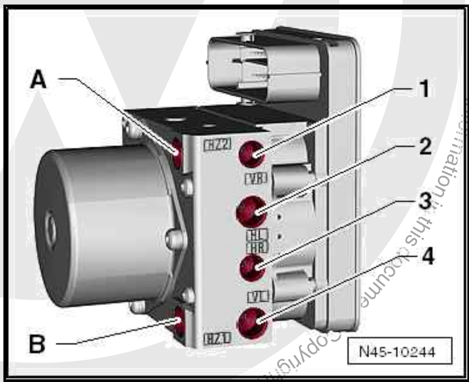
B - Secondary piston circuit of brake master cylinder to ABS hydraulic unit - N55- .

1 - ABS hydraulic unit - N55- to front right brake caliper.

2 - ABS hydraulic unit - N55- to rear left wheel brake cylinder

3 - ABS hydraulic unit - N55- to rear right wheel brake cylinder

4 - ABS hydraulic unit - N55- to front left brake caliper.



Marks on ABS hydraulic unit - N55- :

A - ABS hydraulic unit - N55- to primary piston circuit of brake master cylinder

- Marking on ABS hydraulic unit - N55- »HZ2«

B - ABS hydraulic unit - N55- to secondary piston circuit of brake master cylinder

- Marking on ABS hydraulic unit - N55- »HZ1«

1 - ABS hydraulic unit - N55- to front right brake caliper.

- Marking on ABS hydraulic unit - N55- »VR«

2 - ABS hydraulic unit - N55- to rear left brake caliper/wheel brake cylinder.

- Marking on ABS hydraulic unit - N55- »HL«

3 - ABS hydraulic unit - N55- to rear right brake caliper/wheel brake cylinder.

- Marking on ABS hydraulic unit - N55- »HR«

4 - ABS hydraulic unit - N55- to front left brake caliper.

- Marking on ABS hydraulic unit - N55- »VL«

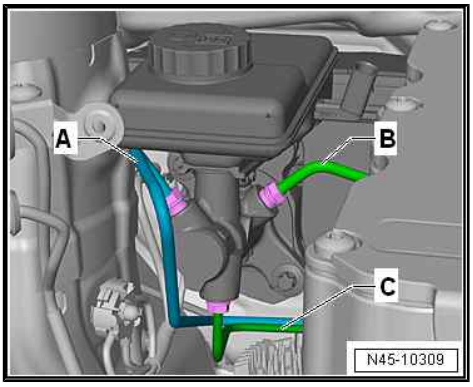
3.3.2 Connecting brake lines to hydraulic unit, RHD

Brake lines on brake master cylinder

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

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

C - Line leading to brake system pressure accumulator - VX70-



Brake lines on hydraulic unit

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

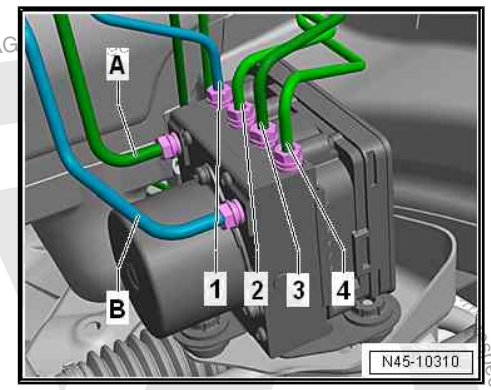
B - Secondary piston circuit of brake master cylinder to hydraulic unit.

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.

- Marked on hydraulic unit with »HZ2«

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

- Marked on hydraulic unit with »HZ1«

1 - From hydraulic unit to front right brake caliper.

- Marked on hydraulic unit with »FR«

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

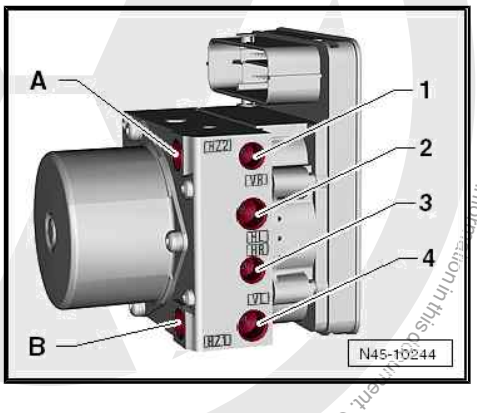
- Marked on hydraulic unit with »RL«

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

- Marked on hydraulic unit with »RR«

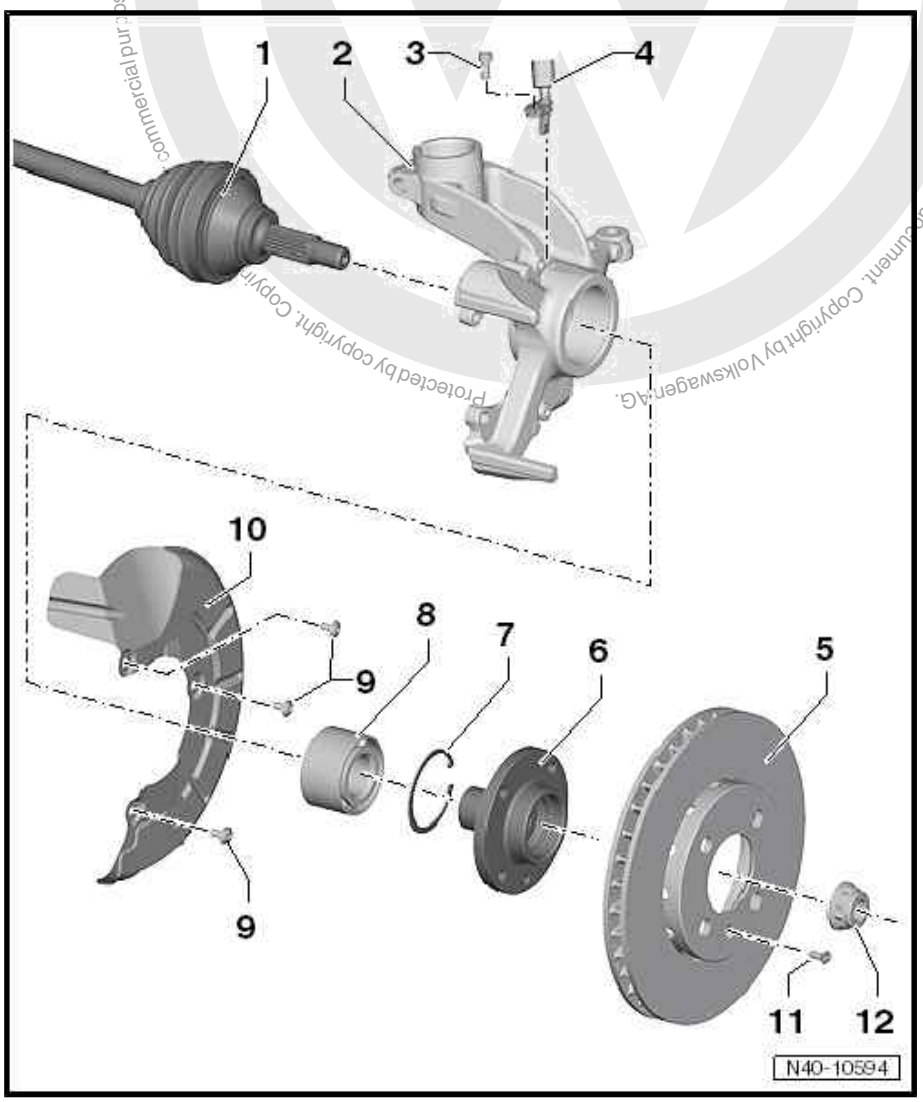
4 - From hydraulic unit to front left brake caliper

- Marked on hydraulic unit with »FL«



4 Sensors

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, clean inner surface of hole
- ❑ Coat inner surface with high-temperature paste G 052 112 A3.
- ❑ Removing and installing ⇒ page 27

5 - Brake disc

6 - Wheel hub

7 - Retaining ring

8 - Wheel bearing

- ❑ ABS sensor ring is installed in wheel bearing ⇒ page 27 .
- ❑ Pressing out and in ⇒ Running gear, axles, steering; Rep. gr. 40 ; Wheel bearing assembly; Renewing wheel bearing assembly .

9 - Torx bolts

- ❑ 12 Nm

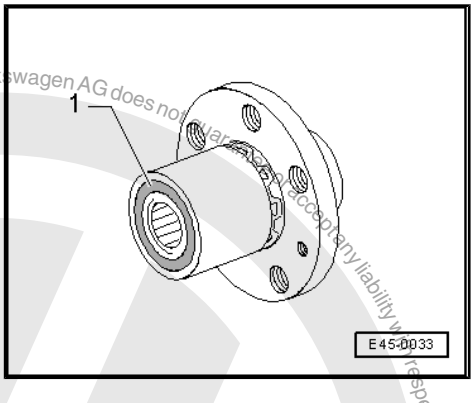
10 - Cover plate

11 - Torx bolt

- ❑ 8 Nm

12 - 12-point nut (self-locking)

ABS sensor ring -1-



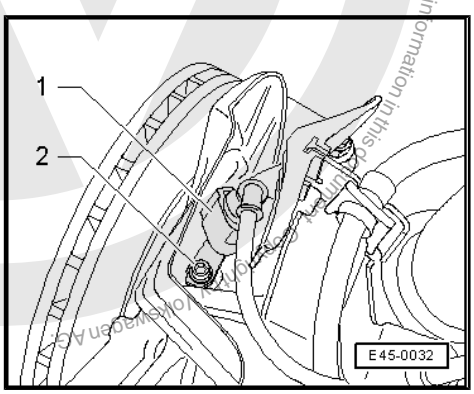
4.2 Removing and installing speed sensor on front axle

Removing:

- Raise vehicle.
- Remove wheel.
- Release connectors -1- and pull off.
- Unscrew bolt -2- from wheel bearing housing.
- Pull ABS speed sensor out of wheel bearing housing.

Installing:

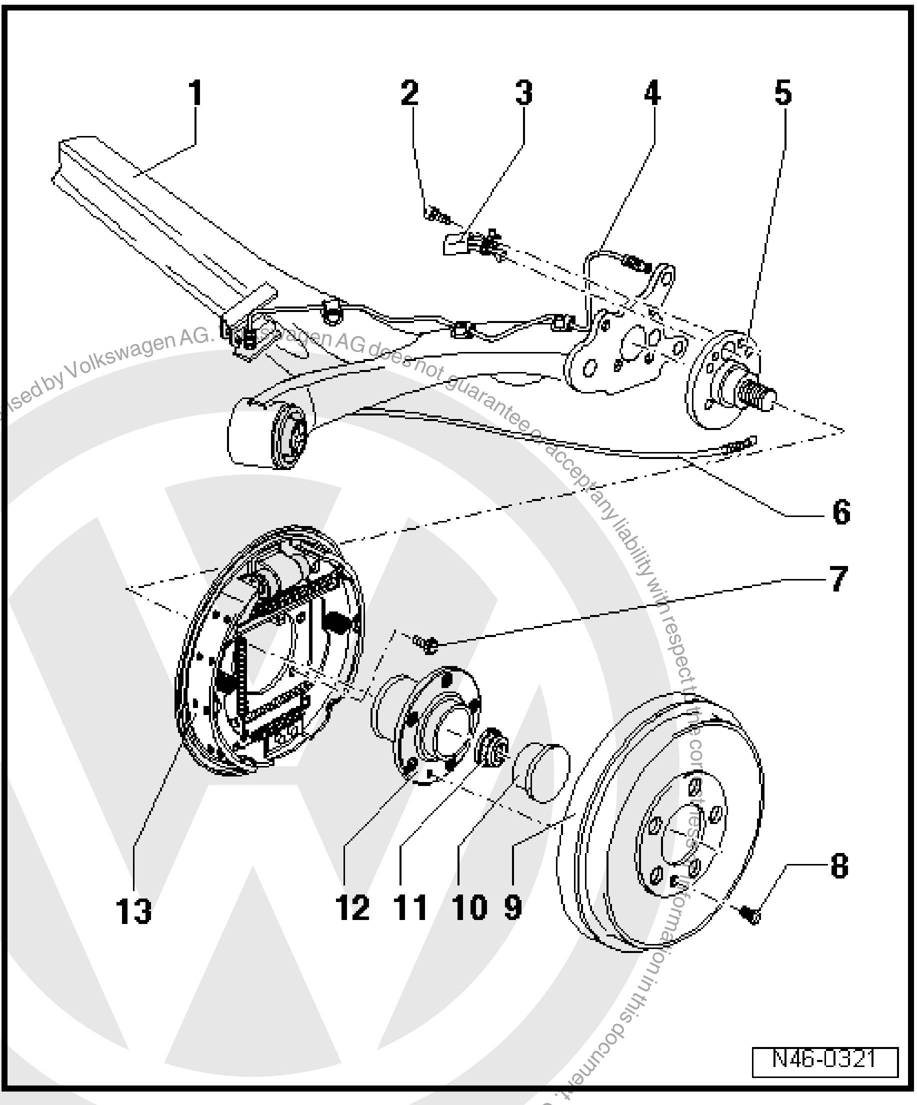
- Clean inside surface of hole before inserting speed sensor.
- Coat speed sensor all-round with high-temperature paste - G 052 112 A3- .
- Insert speed sensor into hole in wheel bearing housing, and tighten bolt.
- Connect speed sensor to speed sensor line.
- Mount wheel.
- Move steering to full left and right lock.
- When doing so, check speed sensor wire for freedom of movement.



Specified torques:

- ⇒ “4.1 Assembly overview - speed sensor on front axle”, page 26

4.3 Assembly overview - speed sensor on rear axle



1 - Subframe

2 - Bolt

- ❑ 8 Nm

3 - ABS speed sensor

- ❑ Clean inside surface of hole before inserting sensor
- ❑ Coat with high-temperature paste G 052 112 A3
- ❑ Removing and installing ⇒ page 29

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 - Bolt

- ❑ 8 Nm

9 - Brake drum

- ❑ Reset brake before removing brake drum ⇒ page 39

10 - Cap

- ❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 42 ; Suspension link wheel bearing; Assembly overview - wheel bearings .

11 - 12-point nut (self-locking)

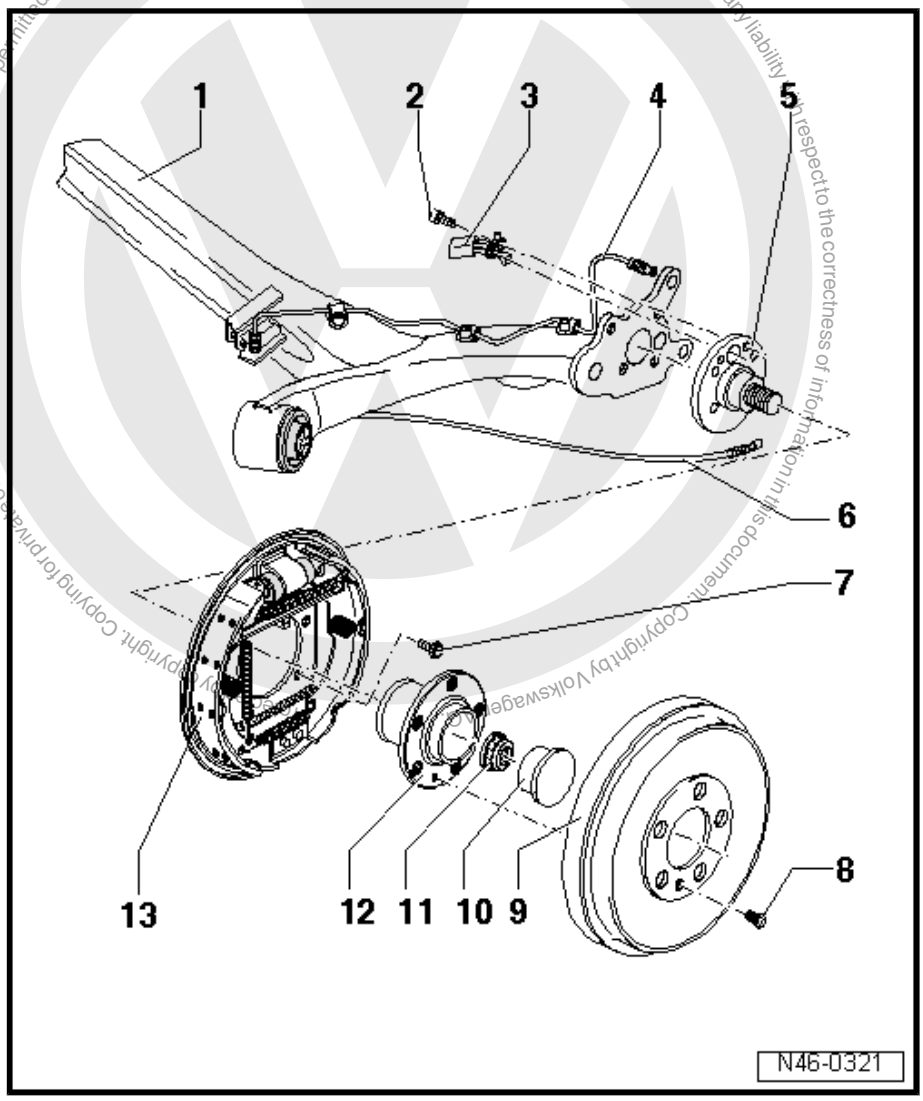
- ❑ Renew after each removal ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview – wheel bearing

12 - Wheel hub with wheel bearing

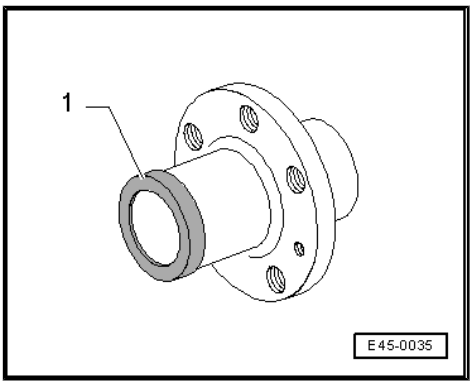
- ❑ ABS sensor ring is installed in wheel bearing ⇒ page 29 .
- ❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 42 ; Suspension link wheel bearing; Assembly overview - wheel bearings .

13 - Brake backplate with brake shoes

- ❑ Reset brake before removing brake drum ⇒ page 39



ABS sensor ring -1-



4.4 Removing and installing speed sensor on rear axle

Removing:

– Raise vehicle.

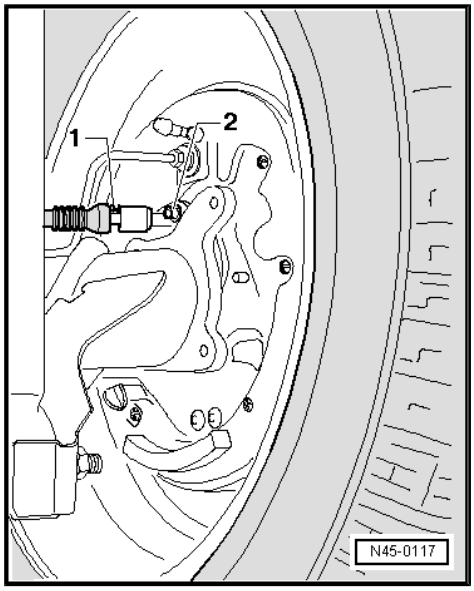
– Release connectors -1- and pull off.
– Unscrew bolt -2- from stub axle.
– Pull ABS speed sensor out of stub axle.

Installing:

– Clean inside surface of hole before inserting speed sensor.
– Coat speed sensor all-round with high-temperature paste G 052 112 A3.
– Insert speed sensor into hole in wheel bearing housing, and tighten bolt.
– Connect speed sensor to speed sensor line.

Specified torques:

◆ ⇒ “4.1 Assembly overview - speed sensor on front axle”, page 26



4.5 Removing and installing steering angle sender

Note different possible fitting locations depending on the steering column installed.

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

Fitting 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 perform 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

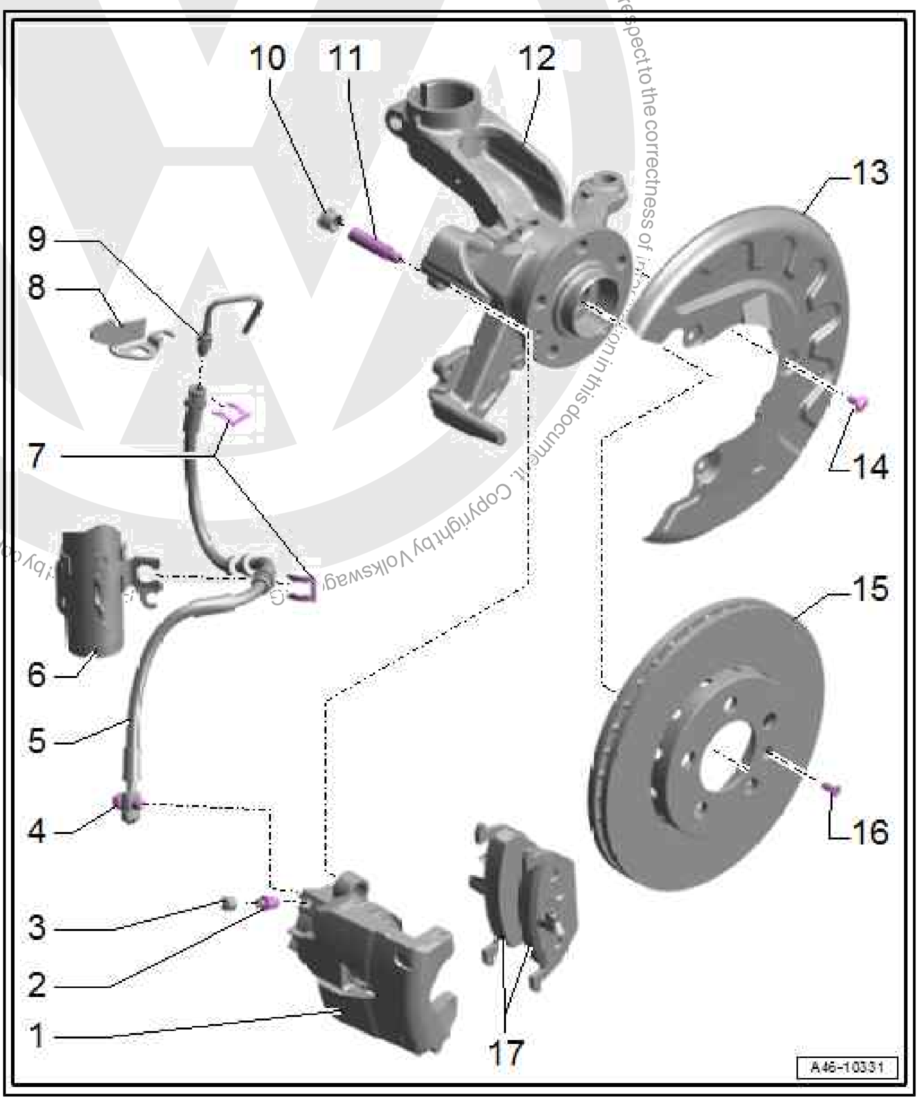
⇒ “1.1 Assembly overview - front brake”, page 31
⇒ “1.2 Removing and installing brake pads”, page 32
⇒ “1.3 Removing and installing brake caliper”, page 34

1.1 Assembly overview - 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 6860- to draw off brake fluid from the brake fluid reservoir.*
- *Before removing a brake caliper or disconnecting a brake hose, fit brake pedal depressor - V.A.G 1869/2- (when doing this, release pressure in system).*

Assembly overview - brake caliper FS III:



1 - Brake caliper
- ❑ Do not disconnect brake hose when changing brake pads.
- ❑ Removing and installing ⇒ page 34
- ❑ Repairing ⇒ page 54

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

3 - Dust cap
- ❑ Fit onto bleeder valve

4 - Banjo bolt
- ❑ Captive, with seals
- ❑ 35 Nm

5 - Brake hose with banjo union and banjo bolt
- ❑ Ensure correct installa-

tion position

6 - Suspension strut

7 - Retaining clip

8 - Bracket

9 - Brake line

- ❑ 14 Nm

10 - Cap

- ❑ Qty. 2

11 - Guide bolt

- ❑ 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 4
- ❑ Always renew on both sides
- ❑ Unscrew brake caliper prior to removal.
- ❑ 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

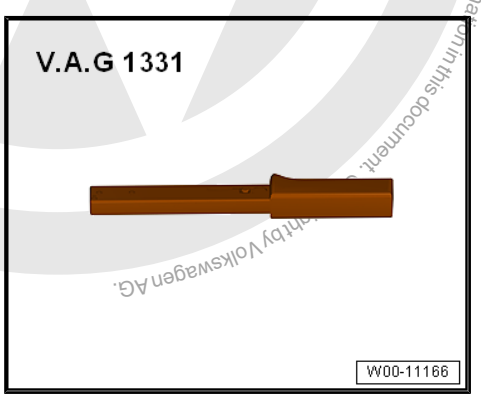
17 - Brake pads

- ❑ Wear limit: 2 mm not including backplate
- ❑ Check thickness ⇒ Maintenance ; Booklet ; Front and rear brake discs and pads/linings: Checking condition of discs and thickness of pads/linings
- ❑ Always renew on both sides
- ❑ Removing and installing ⇒ page 32

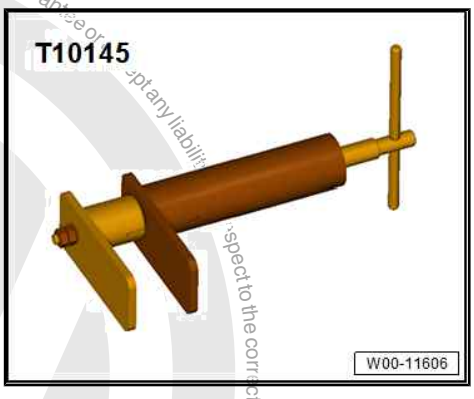
1.2 Removing and installing brake pads

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



- Piston resetting appliance - T10145-



Removing:

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

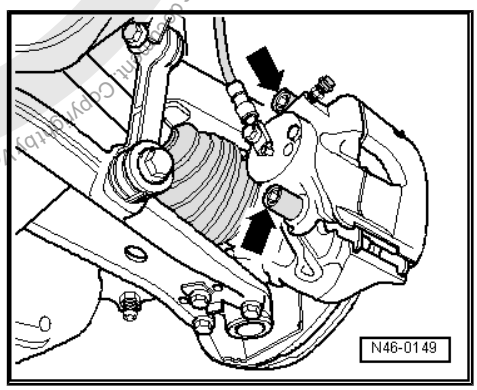
– Remove wheels.

– 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 guiding surface for brake pads on brake carrier, and remove corrosion.

– Clean brake caliper.

Use only methylated spirits for cleaning the brake caliper housing.

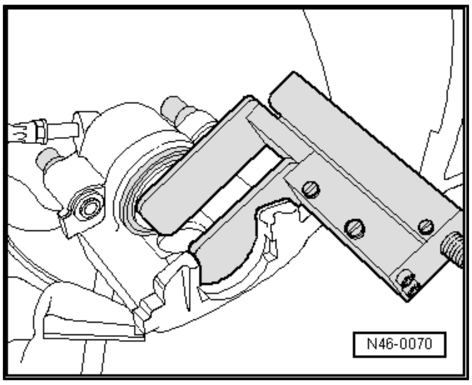
Installing:

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

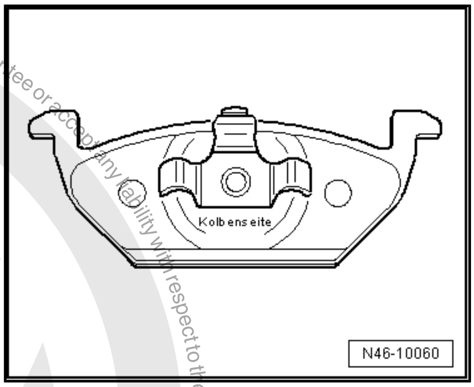
– Lightly grease guiding surface for brake pads on brake carrier with lithium grease G 052150 A2.

– 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.

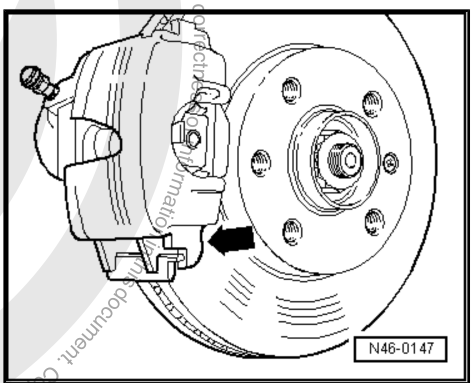
– First position brake caliper at bottom -arrow- of brake carrier.

• 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.*

Specified torques:

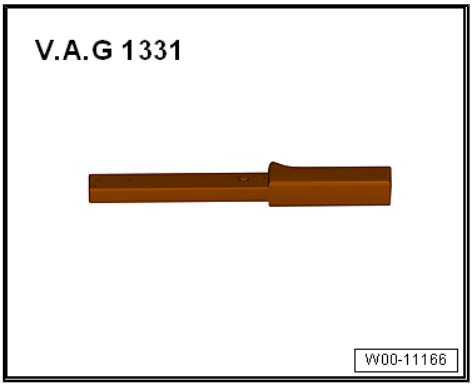
♦ ⇒ “1.1 Assembly overview - front brake”, page 31

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

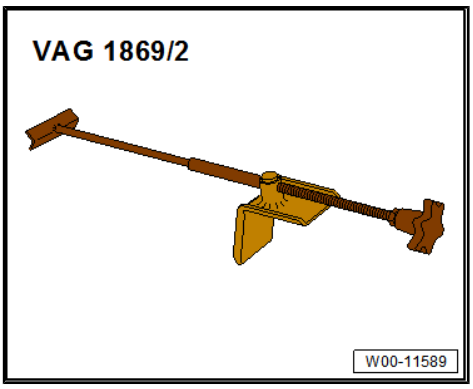
1.3 Removing and installing brake caliper

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



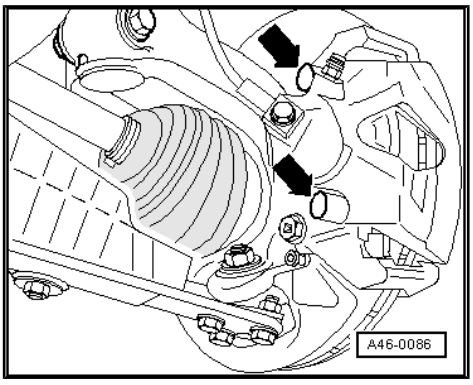
♦ Brake pedal depressor - V.A.G 1869/2-



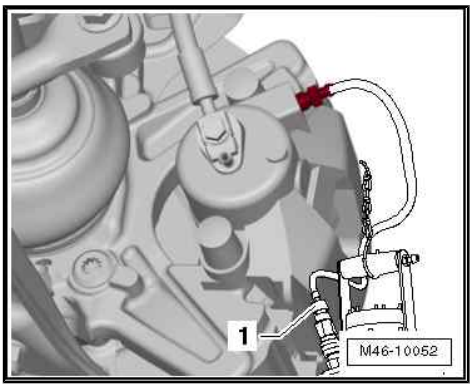
Removing:

This procedure applies only to exchanging as well as the following repair work on the brake caliper:

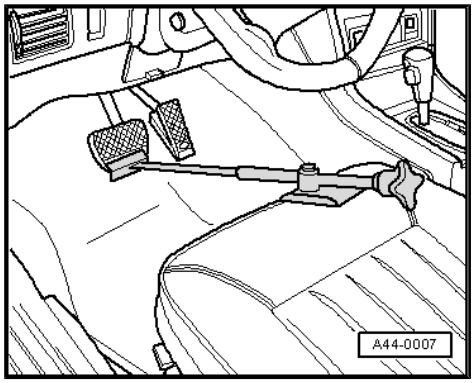
– Loosen wheel bolts.
– Raise vehicle.
– Remove wheel.
– Remove protective caps -arrows-.



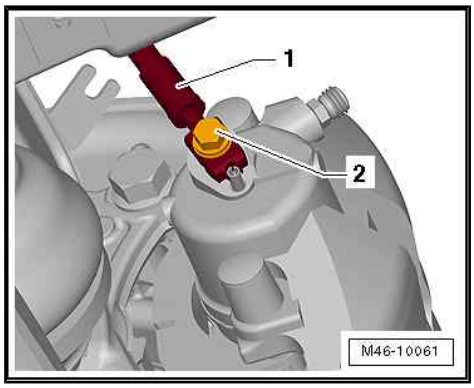
– Connect hose of bleeder bottle -1- to bleeder valve of brake caliper.
– Open bleeder valve.



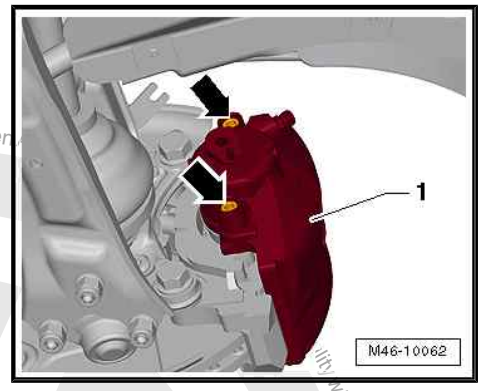
– Apply brake pedal depressor - V.A.G 1869/2- .
– Close bleeder screw and remove bleeder bottle.



– Unscrew screw-type brake hose connection -1- with banjo bolt -2- from brake caliper.
– Immediately seal brake line and threaded hole with sealing plugs - 1H0 698 311 A- .



– Unscrew and remove guide pins -arrows- from brake caliper -1-.
– Remove brake caliper from brake carrier.
– Remove brake pads.



Cleaning:

WARNING

Health hazard due to poisonous dust from brake system.

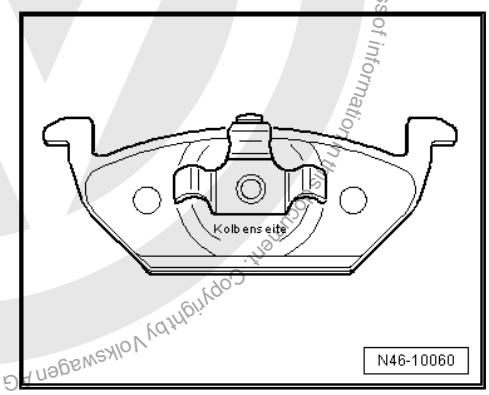
Risk of irreversibly deposited dust particles in the lungs. Risk of respiratory health problems.

– Never blow out the brake system with compressed air.

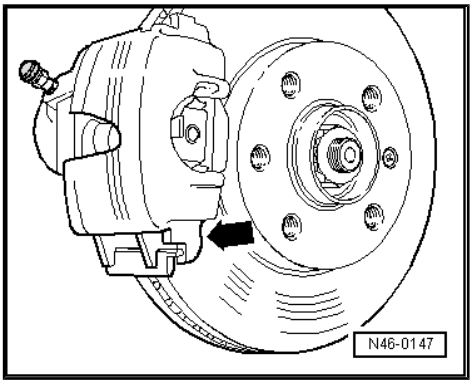
Use only methylated spirits for cleaning the brake.

Installing:

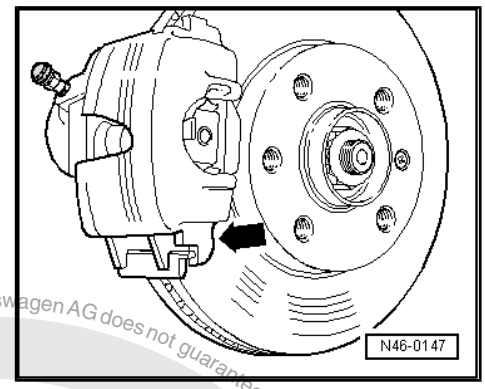
• The piston is pressed back.
– Insert brake pads into brake caliper and piston.
– Insert brake pad with “piston side” written on backing plate into brake piston.



– 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 depressor - V.A.G 1869/2- .
– Bleed brake system ⇒ page 89 .
– 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.*

Specified torques:

♦ ⇒ page 31

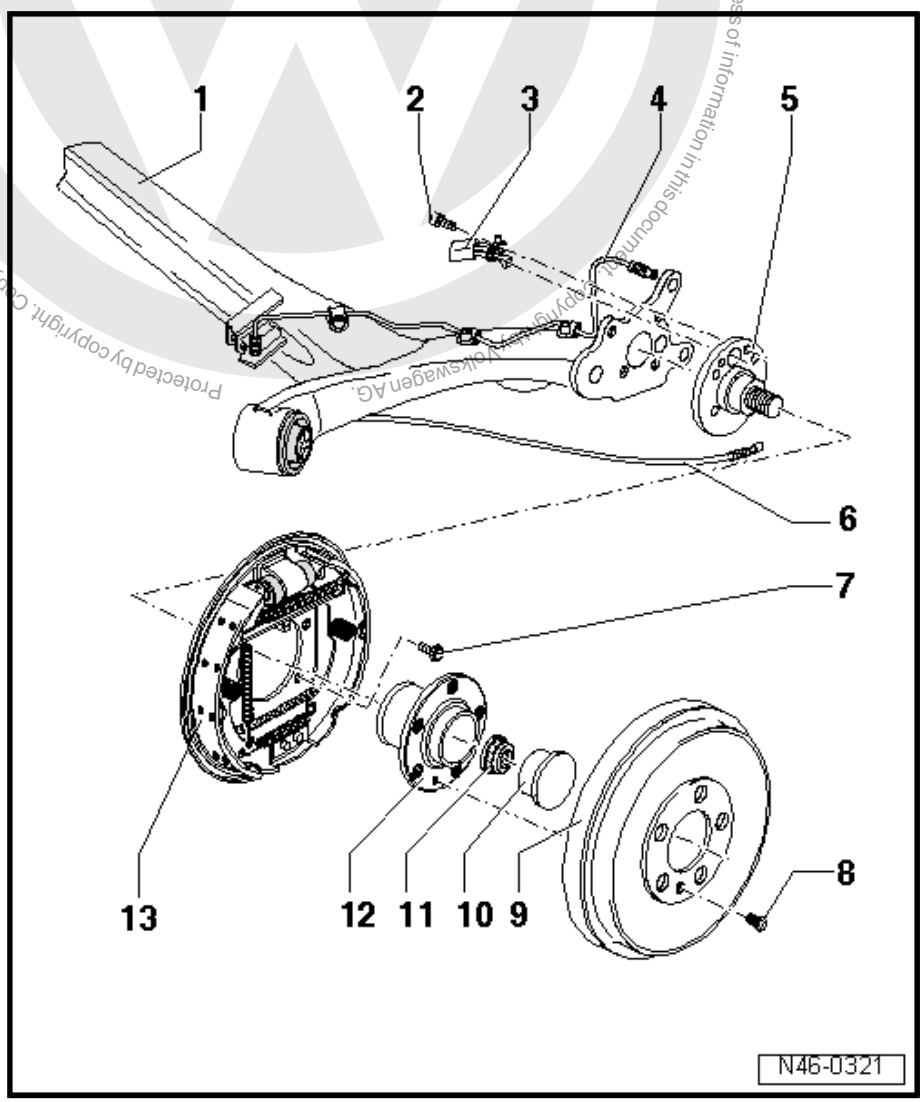
♦ Specified torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts .

2 Rear brake

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 6860- 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 - Subframe

2 - Bolt
- ❑ 8 Nm

3 - ABS speed sensor
- ❑ Clean inside surface of hole before inserting sensor
- ❑ Coat with high-temperature paste G 052 112 A3

4 - Brake line
- ❑ 14 Nm

5 - Stub axle

6 - Brake cable
- ❑ Adjusting parking brake ⇒ page 47

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

8 - Bolt
- ❑ 8 Nm

9 - Brake drum
- ❑ Brake drum diameter: 200 mm
- ❑ Wear limit 201.5 mm
- ❑ Reset brake before removing brake drum

⇒ page 39 .

- ❑ Clean carefully and
  check for wear, damage, dimensional accuracy and flawless brake surface.

10 - Cap

- ❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 42 ; Suspension link wheel bearing; Assembly overview - wheel bearings .

11 - 12-point nut (self-locking)

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

12 - Wheel hub with wheel bearing

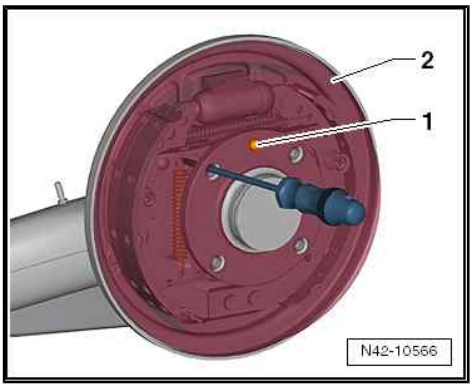
- ❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearings, trailing arm; Removing and installing wheel bearing unit

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 39 .

2.2 Resetting drum brakes

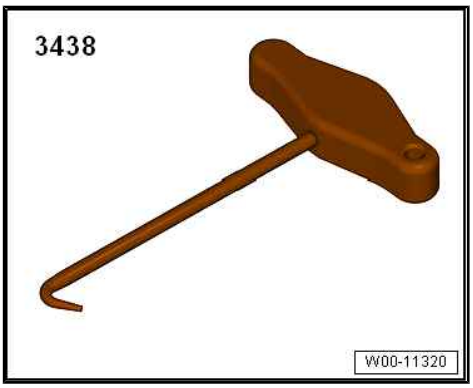
– Insert a screwdriver through a wheel bolt threaded hole in the brake drum, and push the wedge upwards.



2.3 Removing and installing brake shoes

Special tools and workshop equipment required

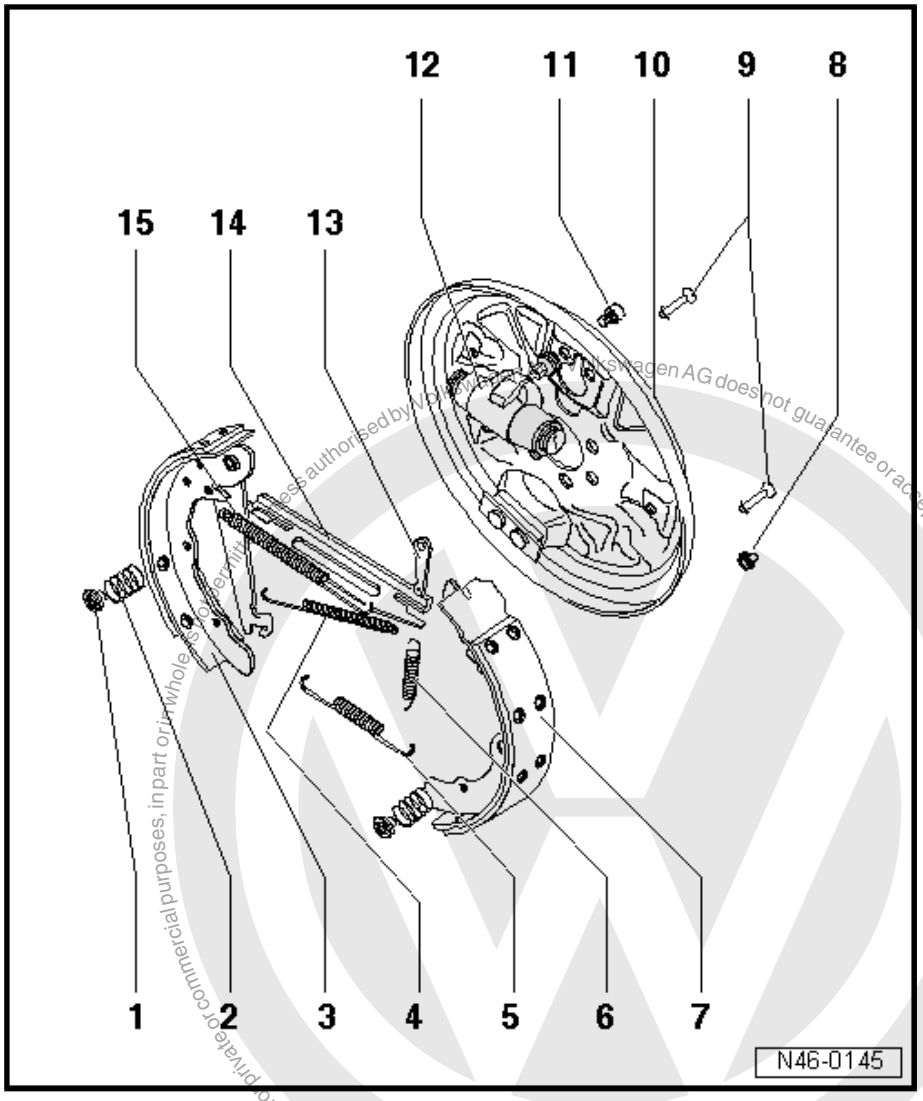
- ♦ Hook - 3438-



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 39
- ❑ Adjusting parking brake ⇒ page 47

4 - Upper return spring

- ❑ Detach with hook - 3438- .

5 - Lower return spring

- ❑ Grease contact surface with lubricating paste - 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 - Hold-down pin

10 - Brake carrier

11 - Torx bolt

- ❑ 8 Nm

12 - Wheel brake cylinder

- ❑ Check for leaks ⇒ page 94

13 - Wedge

- ❑ Resetting drum brake ⇒ page 39

14 - Push bar

- ❑ Grease contact surface with lubricating paste - G 000 650- .

15 - Locating spring

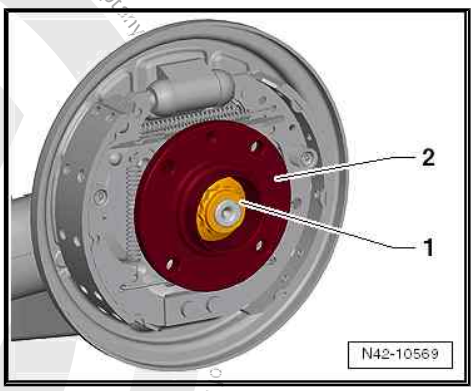
- ❑ Detach with hook - 3438- .

Removing:

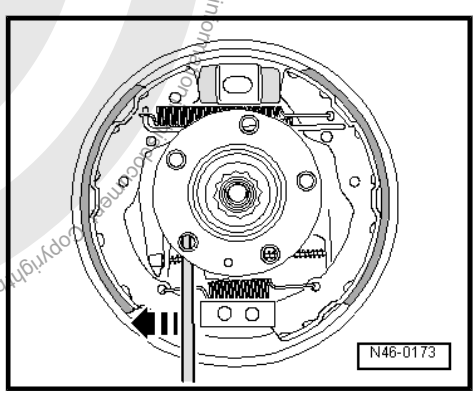
– Remove wheels.

– Remove drum brake. Reset brake prior to removal ⇒ page 39 .

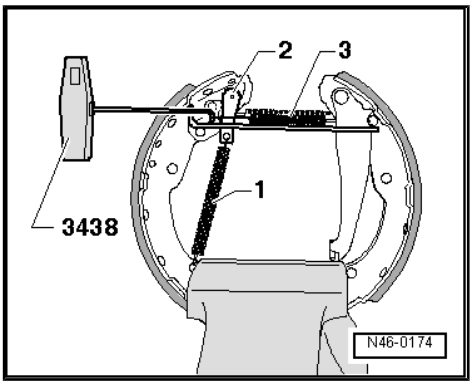
– Remove wheel hub -2- ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Removing and installing wheel bearing unit .
– Remove spring plate with spring.



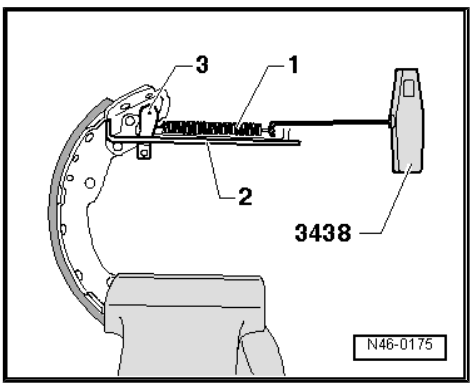
– Using a screwdriver, lever out brake shoes behind lower support plate in direction of arrow.
– Place brake shoe down on lower support plate.
– Unhook lower return spring.
– Detach brake cable.
– Remove brake shoes.
– Clamp brake shoes in vice.



– Remove spring -1- for wedge -2-.
– Remove upper return spring -3- with hook - 3438- .



– Detach locating spring -1- using hook - 3438- .
– Remove plunger rod -2- and wedge -3- from 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.

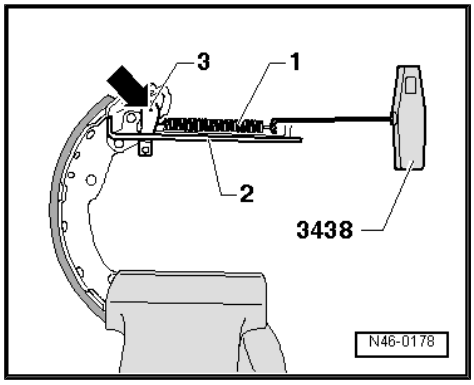
Installing:

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

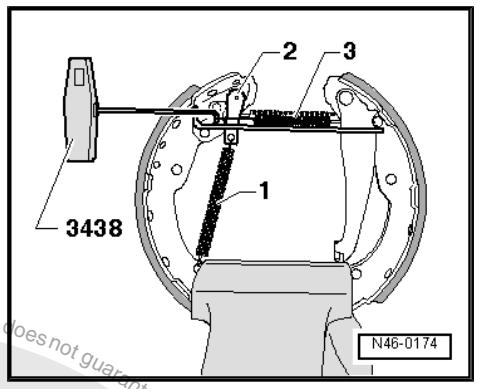
Installation position:

Raised portion -arrow- must remain visible when installing.

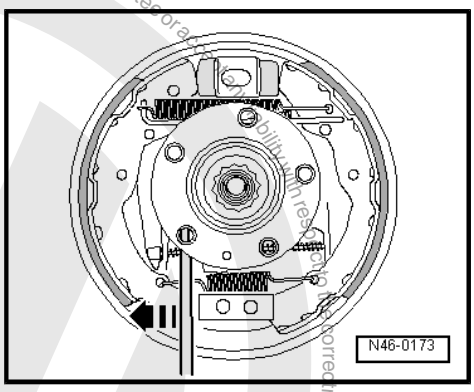
– Insert brake shoe with brake lever in push rod.



– 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 47 .

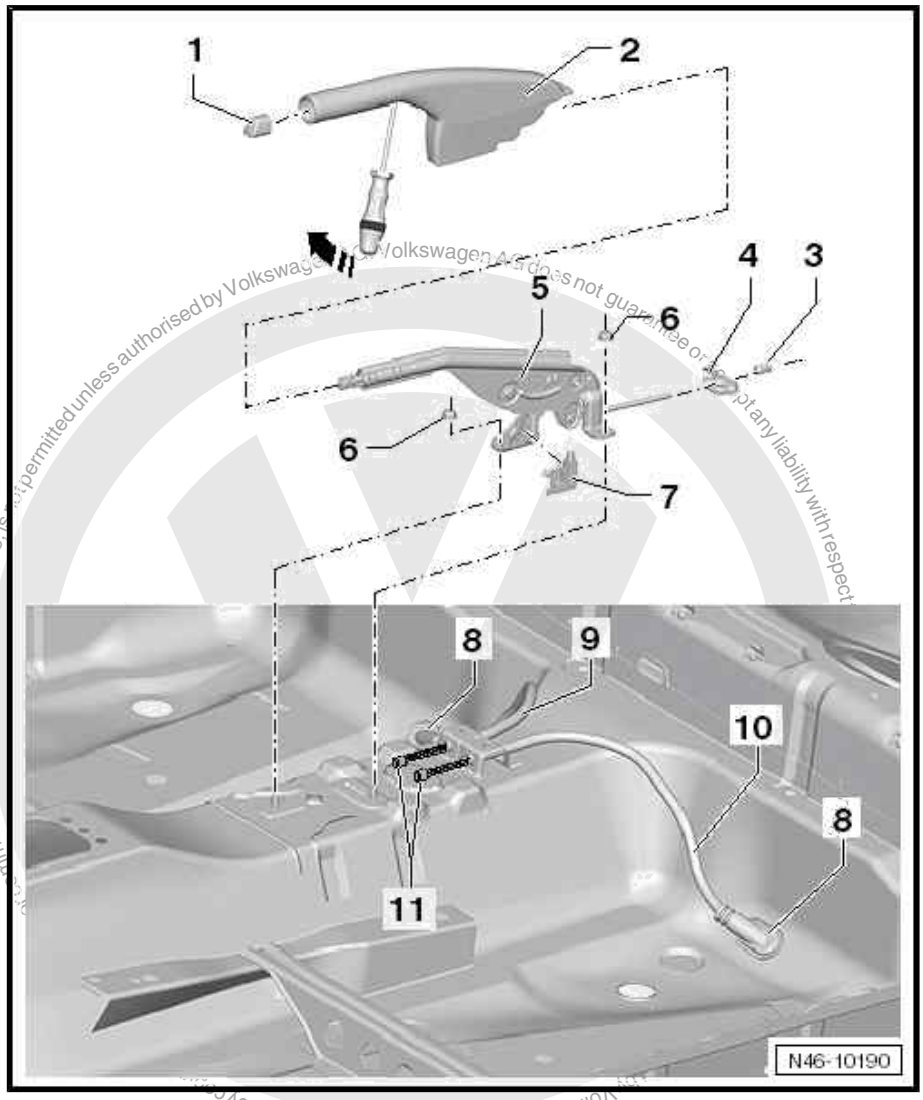


Specified torques:

- ⇒ “2.1 Assembly overview - rear brakes”, page 38
- Specified torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts .
- ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Assembly overview - wheel bearing

3 Parking brake

3.1 Assembly overview - parking brake



1 - Push-button

- ❑ Pulling off ⇒ page 44
- ❑ 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 44
- ❑ Lever up release tab in rear lower area of handle with a screwdriver.
- ❑ Then pull off forwards.

3 - Adjustment nut

- ❑ Adjusting parking brake ⇒ page 47

4 - Compensator

5 - Handbrake lever

- ❑ Before removing, remove handbrake lever trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - handbrake lever trim

6 - Hexagon nut

- ❑ 23 Nm

7 - Parking brake switch - F321-

8 - Rubber grommet

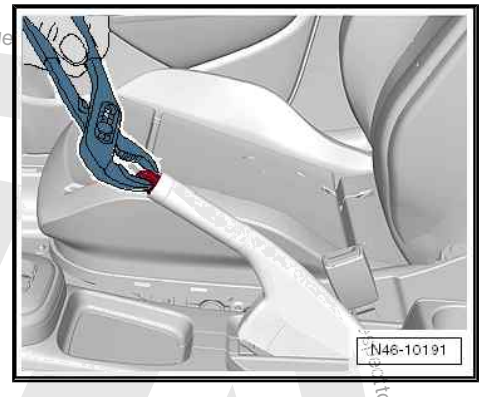
9 - Right guide tube

10 - Left guide tube

11 - Brake cables

- ❑ Removing and installing ⇒ page 44

Removing push button



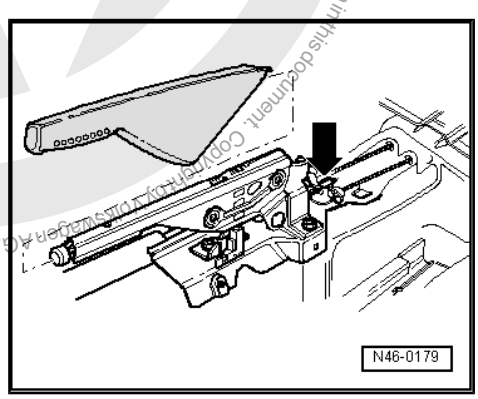
Note

Will be destroyed when removing; must be renewed.

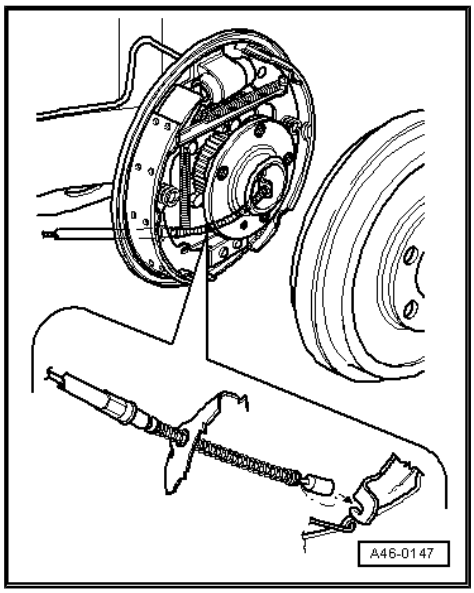
3.2 Removing and installing rear brake cable

Removing:

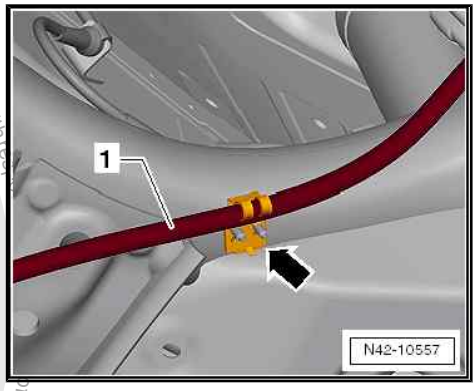
- Remove handbrake lever trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - handbrake lever trim .
- Release parking brake.
- Loosen adjustment nut -arrow- until brake cable can be detached from compensator.
- Raise vehicle.
- Remove wheel.
- Remove drum brake. Reset brake prior to removal ⇒ page 39 .



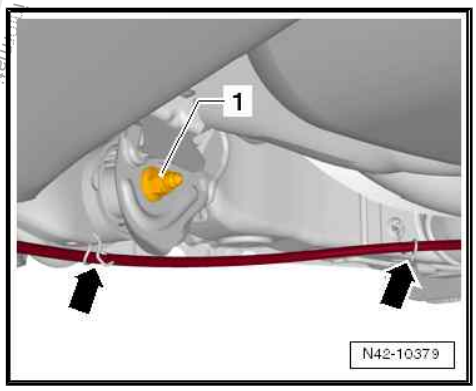
- Unhook brake cable from parking brake lever.
- Pull brake cable out of brake carrier.



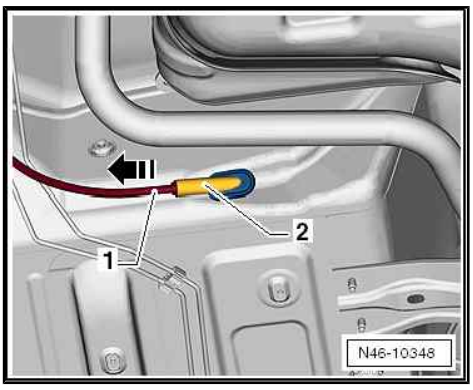
– Unclip brake cable -1- from retainer on axle beam -arrow-.



– Unhook brake cable from retainers -arrows-.

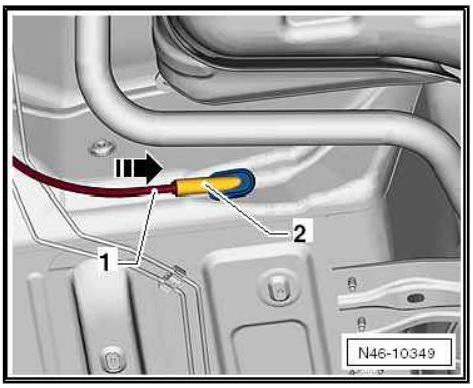


– Pull brake cable -1- in direction of arrow out of guide tube -2-.

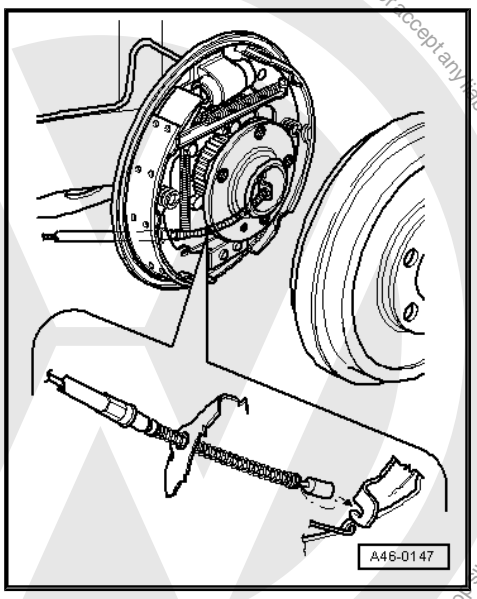


Installing:

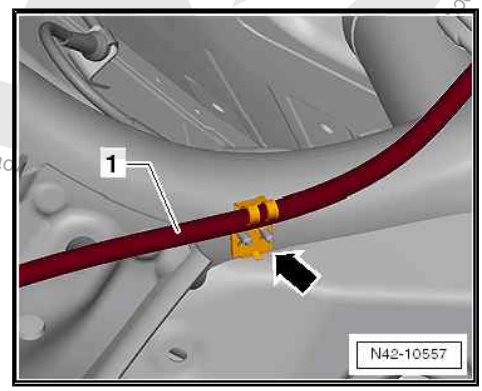
– Fit brake cable -1- in direction of arrow into guide tube -2-.
– Insert brake cable into brake carrier.



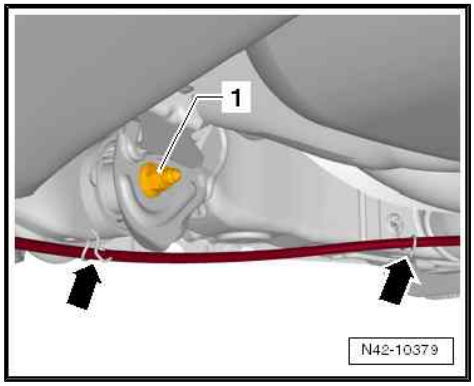
– Attach parking brake cable to parking brake lever.
– Install brake drum.



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



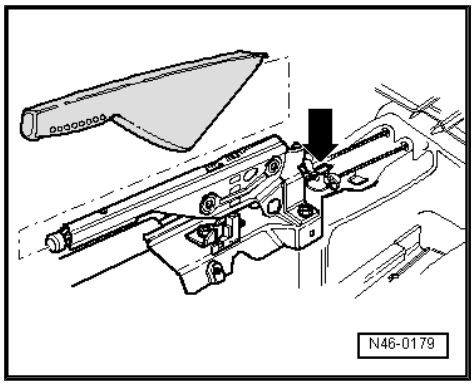
– Hook brake cable into retainers -arrows-.
– Fit brake cable through guide tube.
– Hook brake cable into compensator.



– Pretension brake cable with adjustment nut -arrow-.
– Install wheels.
– Adjusting parking brake ⇒ page 47 .
– Install handbrake lever trim.

Specified torques:

- ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers; Assembly overview – parking brake lever trim
- Specified torque for 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 handbrake lever trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - handbrake lever trim .

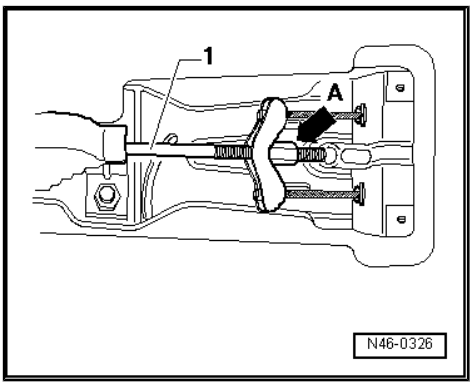
• Foot brake must be functional and bled.

• The brake cables are routed without stress and attached to the lever in the drum brake.

• The handbrake lever is in rest position.

– Depress foot brake hard at least three times.

– Pretension brake cable with adjustment nut -arrow A- just until handbrake lever returns to rest position on its own (see note below).



Note

Pull handbrake lever from rest position to just before it engages in first tooth. Then, release handbrake lever. The handbrake lever must return to rest position on its own.

– Pull and release handbrake lever three times.

– Pull handbrake lever over 2 notches.

– Tighten adjustment nut -arrow A- until both wheels cannot be turned by hand.

– Release parking brake and check that both wheels turn freely. If required turn adjustment nuts back slightly.

– The handbrake lever must return to rest position on its own.

Note

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

– Install handbrake lever trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - handbrake lever trim .

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

– Perform basic setting for electromechanical brake servo ⇒ Vehicle diagnostic tester.

4 Brake pedal

4.1 Assembly overview - brake pedal

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 52

2 - Hexagon bolt

3 - Hexagon nut

- ❑ Self-locking
- ❑ Renew after each removal
- ❑ 25 Nm

4 - Brake pedal

- ❑ Removing and installing ⇒ page 51

5 - Cap

6 - Bearing bush

7 - Support

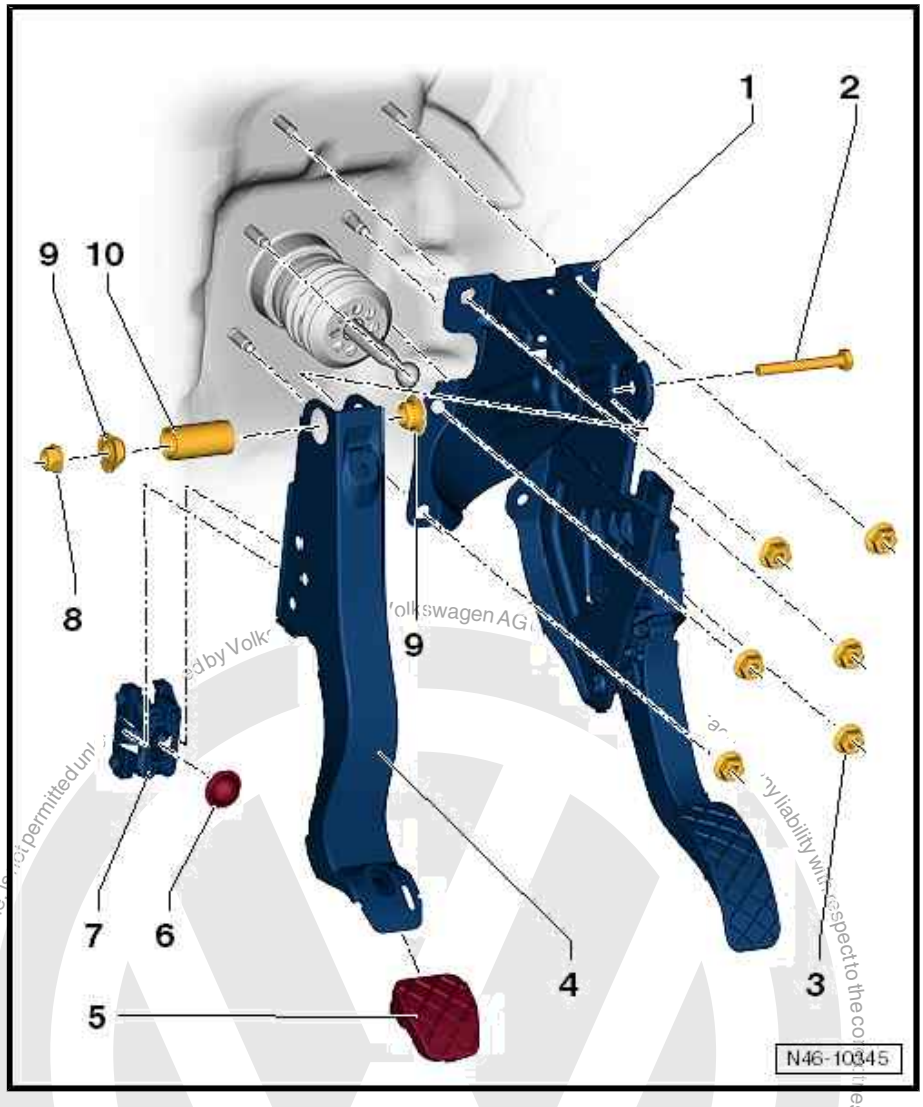
- ❑ For ball head of brake servo push rod

8 - Hexagon nut

- ❑ Self-locking
- ❑ Renew after each removal.
- ❑ 25 Nm

9 - Bearing bush

10 - Locating pin

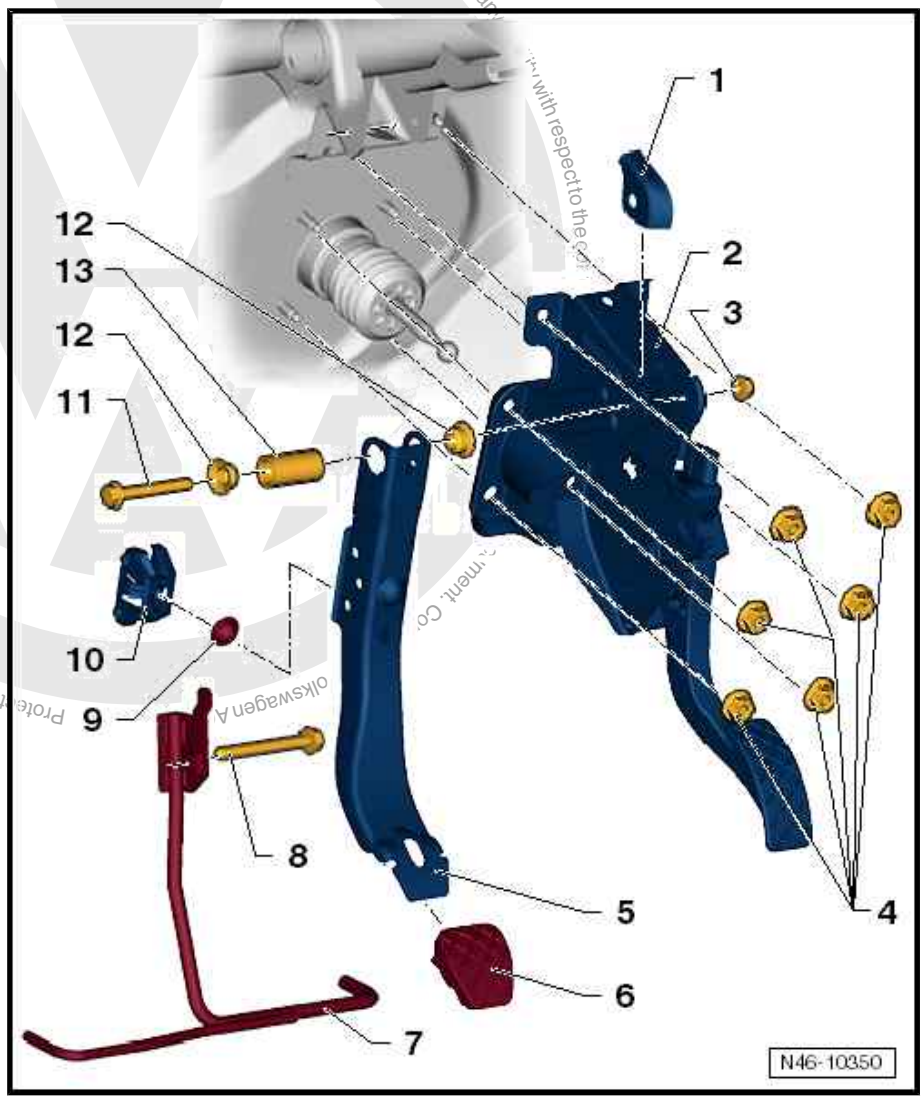


4.1.2 Assembly overview - brake pedal, right-hand drive

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 53

3 - Hexagon nut

- ❑ Renew after each removal.
- ❑ 25 Nm

4 - Hexagon nut

- ❑ Renew after each removal.
- ❑ 25 Nm

5 - Brake pedal

- ❑ Removing and installing ⇒ page 52

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

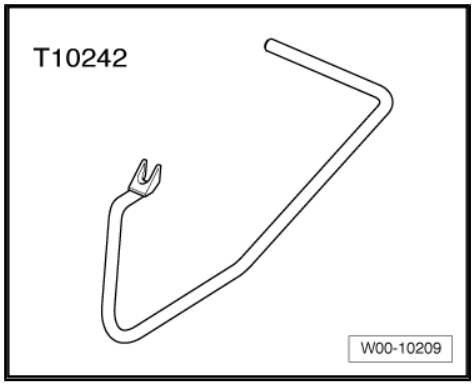
12 - Bearing bush

13 - Locating pin

4.2 Separating brake pedal from brake servo

Special tools and workshop equipment required

♦ Release tool - T10242-



– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers; Assembly overview – dash panel trim on driver side .

– Remove crash bar ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .

– First, press brake pedal -1- in direction of brake servo -2-, and hold it in this position.

1 - Brake pedal

2 - Brake servo and plunger rod

3 - Mounting for ball head

4 - Retaining lugs

– Insert release tool - T10242- and pull it towards driver seat. Counterhold on brake pedal -1- while doing so.

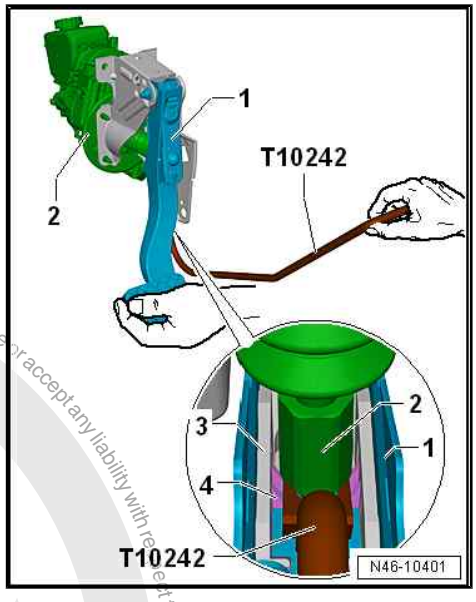
• Brake pedal must not move backwards.

– While doing so, the retaining lugs -4- will be pressed out of mounting -3- off ball head of push rod -2-.

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

– Pull release tool - T10242- and brake pedal together towards driver seat.

While doing so, the brake pedal will be pulled off the ball head of the plunger rod.



4.3 Connecting brake pedal to brake servo

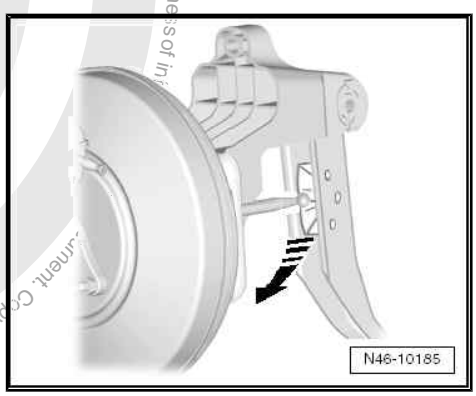
– Hold ball head of plunger rod in front of mounting, and push brake pedal in direction of -arrow- towards brake servo, so that the ball head can be heard to engage.

– Ensure proper engagement by briefly pulling on brake pedal.

Specified torques:

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

♦ ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Assembly overview – Dash panel cover on driver side



4.4 Removing and installing brake pedal

⇒ “4.4.1 Removing and installing brake pedal, left-hand drive vehicles”, page 51

⇒ “4.4.2 Removing and installing brake pedal, right-hand drive vehicles”, page 52

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

Removing:

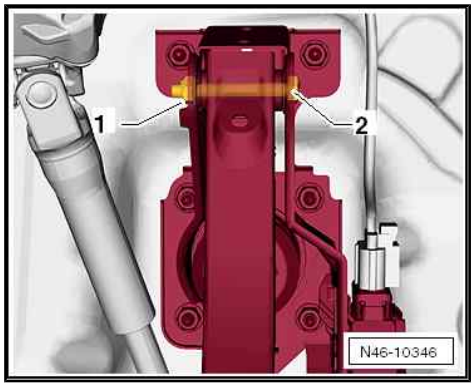
– Separate brake pedal from brake servo ⇒ page 50 .

– Unscrew hexagon nut -1-.
– Pull out hexagon bolt -2-.
– Remove brake pedal.

Installing:

Install in reverse order.

– Clip brake pedal to brake servo ⇒ page 51 .



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 53 and then brake pedal.

4.5 Removing and installing mounting bracket

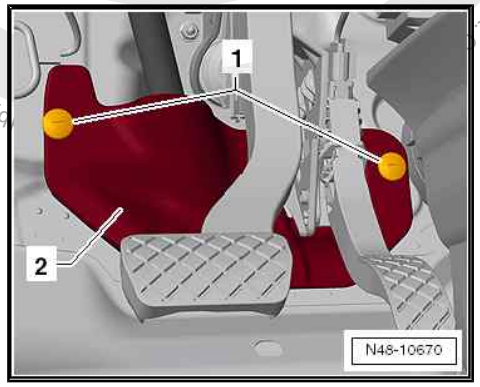
⇒ “4.5.1 Removing and installing pedal cluster (LHD)”, page 52

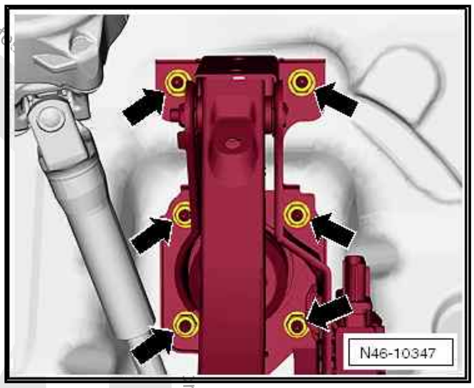
⇒ “4.5.2 Removing and installing pedal cluster (RHD)”, page 53

4.5.1 Removing and installing pedal cluster (LHD)

Removing:

– Remove dash panel trim in driver footwell ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments and covers; Assembly overview – Dash panel trim on driver side .
– Remove crash bar ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .
– Unscrew bolts -1- and remove footwell trim -2-.
– Pull connector off accelerator pedal position sender.
– Separate brake pedal from brake servo ⇒ page 50 .





– Unscrew hexagon nuts -arrows- from pedal cluster.

– Remove foot pedal cluster.

Installing:

Install in reverse order.

– Clip brake pedal to brake servo ⇒ page 51 .

Specified torques

♦ ⇒ “4.1.1 Assembly overview - brake pedal, left-hand drive”, page 48

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 50 .

– Remove crash bar ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .

– Pull connector off accelerator pedal position sender.

– Unscrew hexagon nuts -arrows- from pedal cluster.

– Remove foot pedal cluster.

Installing:

Install in reverse order.

– Clip brake pedal to brake servo ⇒ page 51 .

Specified torques:

♦ ⇒ “4.1.2 Assembly overview - brake pedal, right-hand drive”, page 49

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

♦ ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers; Removing and installing dash panel trim on driver side

♦ ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel end trim

47 – Brakes - hydraulics

1 Front brake caliper

⇒ “1.1 Assembly overview – front brake caliper”, page 54
⇒ “1.2 Removing and installing brake caliper piston”, page 54

1.1 Assembly overview – front brake caliper

- 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.

Assembly overview - brake caliper FS III:

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 - Bearing bush
- ❑ Insert into brake caliper.

4 - Guide bolt
- ❑ 30 Nm

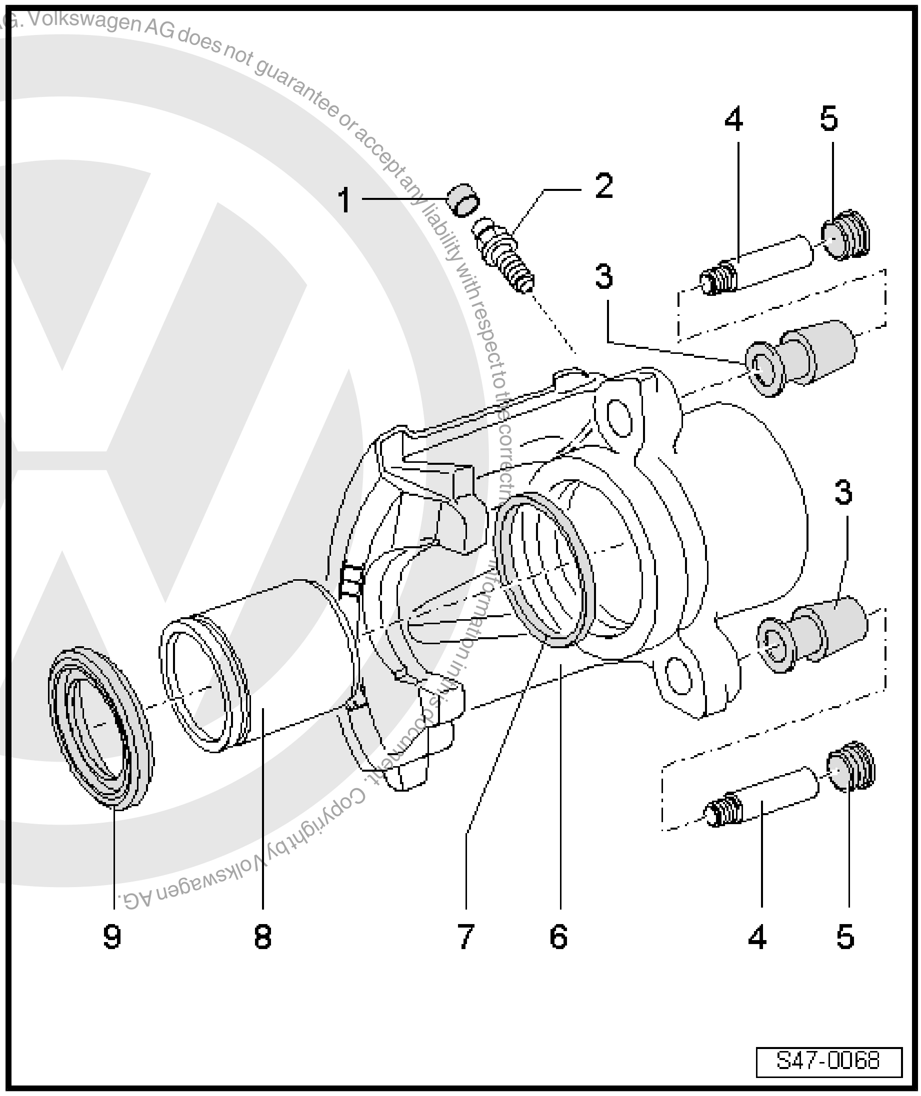
5 - Caps
- ❑ Insert into bearing bush.

6 - Brake caliper

7 - Seal
- ❑ Removing and installing ⇒ page 54

8 - Piston
- ❑ Apply thin coat of assembly paste G 052 150 A2 to piston before inserting.
- ❑ Removing and installing ⇒ page 54

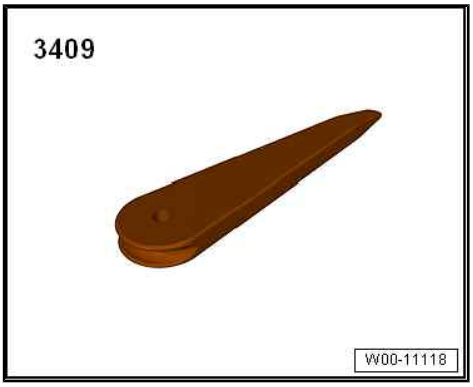
9 - Seal
- ❑ Removing and installing ⇒ page 54



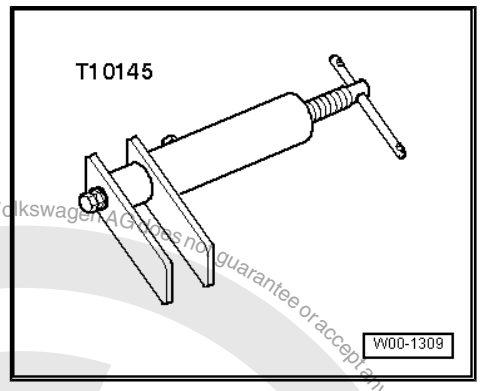
1.2 Removing and installing brake caliper piston

Special tools and workshop equipment required

♦ Removal wedge - 3409-



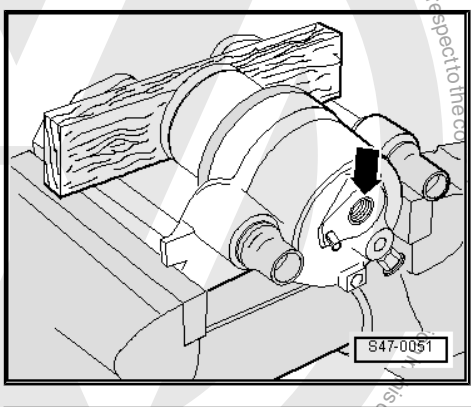
♦ Piston resetting appliance - T10145-



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.

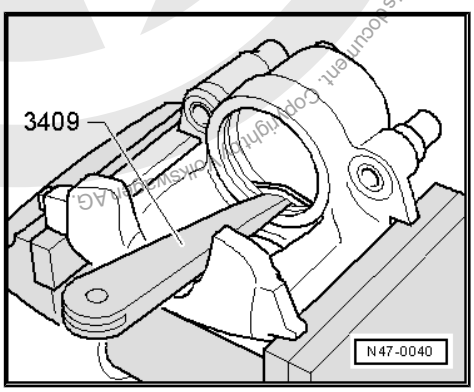
When removing ensure that the surface of the cylinder is not damaged.

Installing:

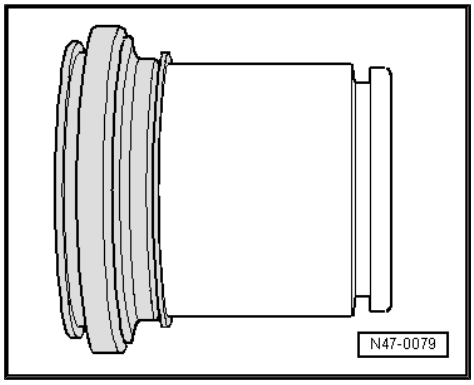
– The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.

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

– Insert seal in brake caliper.

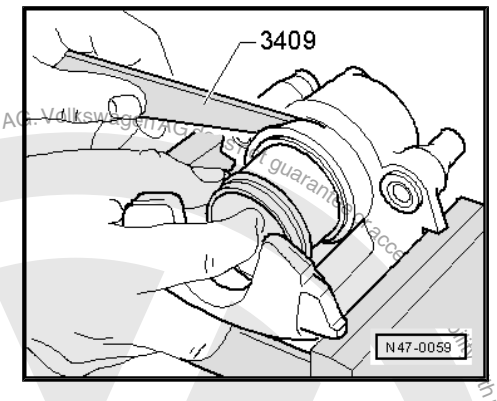


– Place protective cap with outer sealing lip on piston.



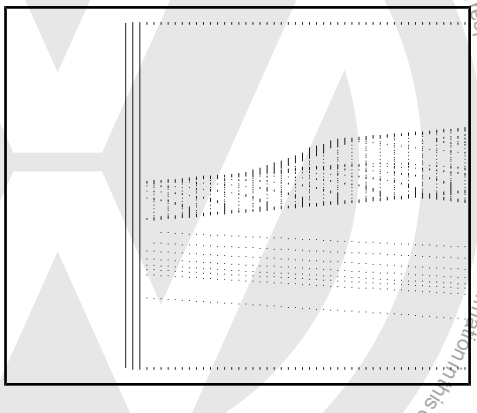
– Insert inner sealing lip into groove in cylinder using wedge 3409.

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



– Press piston into brake caliper using piston resetting appliance.

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

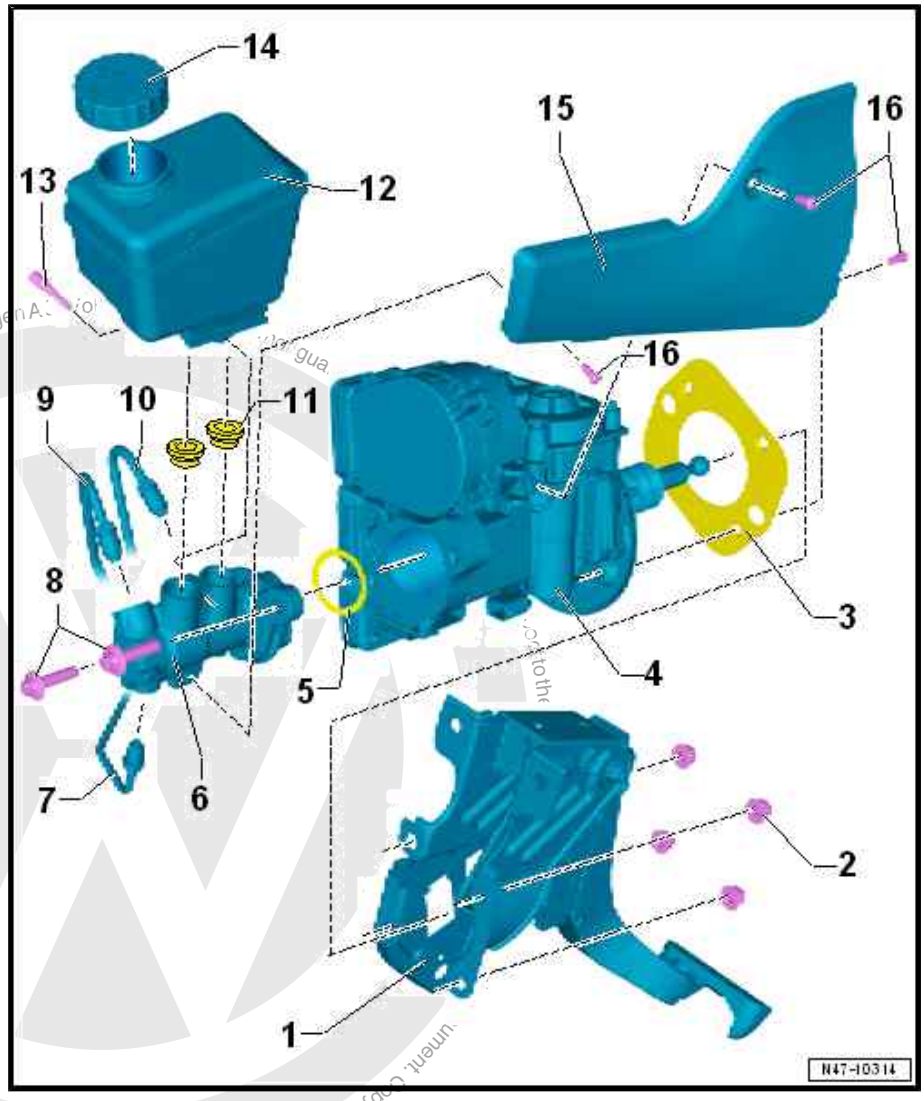


2 Brake servo and brake master cylinder

2.1 Assembly overview - brake servo/brake master cylinder

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

Complete brake master cylinders and brake servos can be renewed independently of each other.



1 - Mounting bracket with brake pedal

- ❑ Assembly overview ⇒ page 48
- ❑ Removing and installing brake pedal ⇒ page 51
- ❑ Removing and installing mounting bracket ⇒ page 51
- ❑ Detaching from brake servo ⇒ page 50 .

2 - Nut

- ❑ Qty. 4
- ❑ Renew after each removal.
- ❑ 25 Nm

3 - Seal

- ❑ For brake servo
- ❑ Check for damage

4 - Brake servo

- ❑ Separating from brake pedal ⇒ page 50 .
- ❑ Removing and installing ⇒ page 65

The following electrical components are integrated in the brake servo:

- ♦ Brake pedal position sender - G100-
- ♦ Brake pedal position sender 2 - G836-
- ♦ Voltage supply sender 1 - G730-
- ♦ Voltage supply sender 2 - G731-
- ♦ Brake servo current sensor - G822-
- ♦ Brake servo temperature sender 1 - G838-
- ♦ Brake servo temperature sender 2 - G839-
- ♦ Motor position sender for brake servo - G840-
- ♦ Brake servo control unit - J539-
- ♦ Electromechanical brake servo motor - V548-

5 - Seal

- ❑ Renew

6 - Brake master cylinder

- ❑ Cannot be repaired. If faulty, renew complete.
- ❑ Removing and installing ⇒ page 78

7 - Brake line

- ❑ Leading to brake system pressure accumulator - VX70-
- ❑ With thread M10 x 1
- ❑ 14 Nm

8 - Bolt

- ❑ Renew after removal
- ❑ 22 Nm

9 - Brake line

- ❑ Brake master cylinder/secondary piston circuit to ABS hydraulic unit - N55- .
- ❑ Marked on hydraulic unit with -HZ1-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

10 - Brake line

- ❑ From primary piston circuit of brake master cylinder to ABS hydraulic unit - N55- .
- ❑ Marked on hydraulic unit with -HZ2-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

11 - Sealing plug

- ❑ Moisten with brake fluid before installing

12 - Brake fluid reservoir

- ❑ With brake fluid level warning contact - F34-

13 - Bolt

- ❑ 4 Nm

14 - Cap

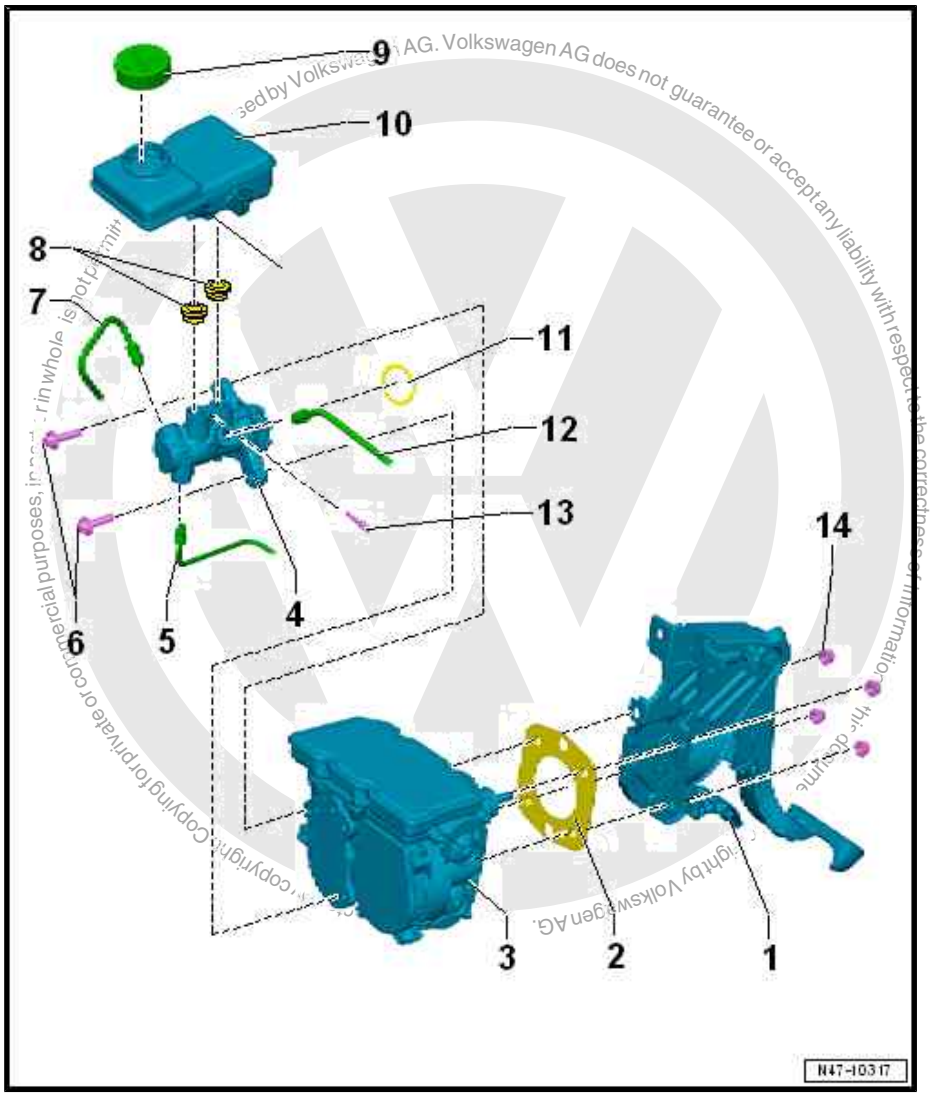
15 - Shield

- ❑ For brake servo

16 - Bolt

- ❑ Qty. 3
- ❑ 6 Nm

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



1 - Mounting bracket with brake pedal

- ❑ Assembly overview ⇒ page 48
- ❑ Removing and installing brake pedal ⇒ page 51
- ❑ Removing and installing mounting bracket ⇒ page 51
- ❑ Detaching from brake servo ⇒ page 50 .

2 - Seal

- ❑ For brake servo
- ❑ Check for damage

3 - Brake servo

- ❑ Separating from brake pedal ⇒ page 50
- ❑ Removing and installing ⇒ page 65

The following electrical components are integrated in the brake servo:

- ♦ Brake pedal position sender - G100-
- ♦ Brake pedal position sender 2 - G836-
- ♦ Voltage supply sender 1 - G730-
- ♦ Voltage supply sender 2 - G731-
- ♦ Brake servo current sensor - G822-
- ♦ Brake servo temperature sender 1 - G838-
- ♦ Brake servo temperature sender 2 - G839-
- ♦ Motor position sender for brake servo - G840-
- ♦ Brake servo control unit - J539-
- ♦ Electromechanical brake servo motor - V548-

4 - Brake master cylinder

- ❑ Cannot be repaired. If faulty, renew complete.
- ❑ Removing and installing ⇒ page 78

5 - Brake line

- ❑ Leading to brake system pressure accumulator - VX70-
- ❑ With thread M10 x 1
- ❑ 14 Nm

6 - Bolt

- ❑ Renew after removal
- ❑ 22 Nm

7 - Brake line

- ❑ Brake master cylinder/secondary piston circuit to ABS hydraulic unit - N55- .
- ❑ Marked on hydraulic unit with -HZ1-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

8 - Sealing plug

- ❑ Moisten with brake fluid before installing

9 - Cap

10 - Brake fluid reservoir

- ❑ With brake fluid level warning contact - F34-

11 - Seal

- ❑ Renew

12 - Brake line

- ❑ From primary piston circuit of brake master cylinder to ABS hydraulic unit - N55- .
- ❑ Marked on hydraulic unit with -HZ2-.
- ❑ With thread M12 x 1
- ❑ 14 Nm

13 - Bolt

- ❑ 4 Nm

14 - Nut

- ❑ Qty. 4
- ❑ Renew after each removal.
- ❑ 25 Nm

2.2 Assembly overview – brake system pressure accumulator

1 - Brake system pressure accumulator - VX70-

- ❑ Removing and installing ⇒ page 62

2 - Bolt

- ❑ 8 Nm

3 - Bracket

- ❑ Check for secure seating after installing.

4 - Bolt

- ❑ 8 Nm

5 - Electrical connector

6 - Rubber damper

- ❑ Do not press rubber dampers out of console when installing the bracket.

7 - Brake line

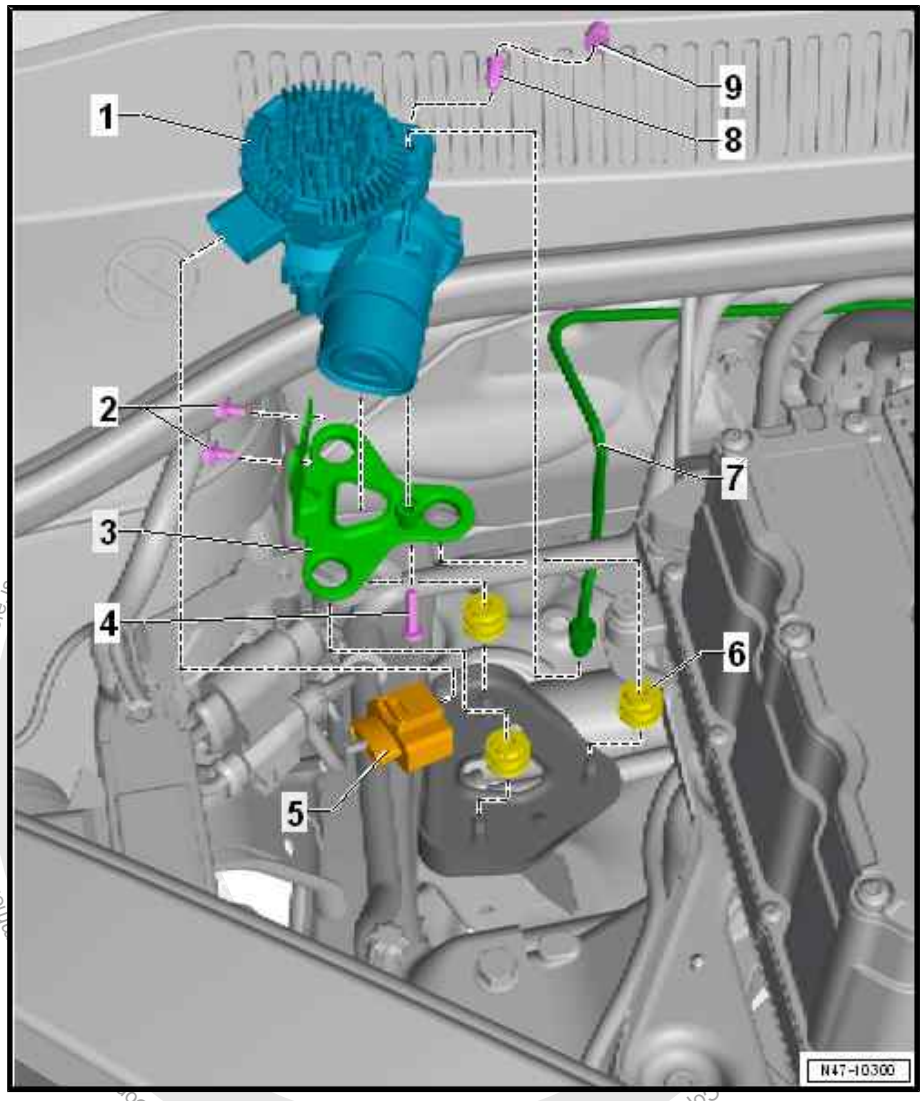
- ❑ To brake master cylinder
- ❑ With thread M10 x 1
- ❑ 14 Nm

8 - Bleeder valve

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

9 - Dust cap

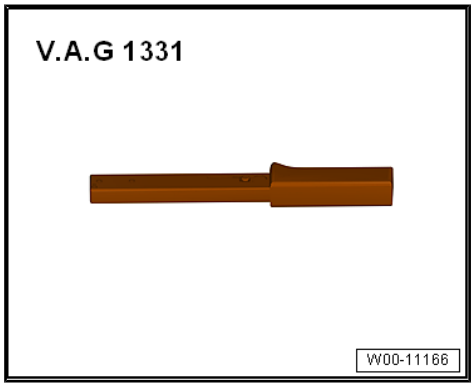
- ❑ Fit onto bleed valve



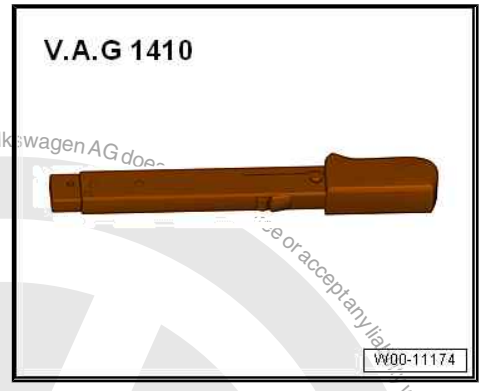
2.3 Removing and installing brake system pressure accumulator - VX70-

Special tools and workshop equipment required

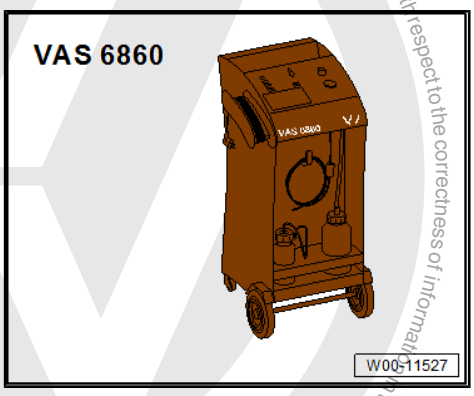
♦ Torque wrench - V.A.G 1331-



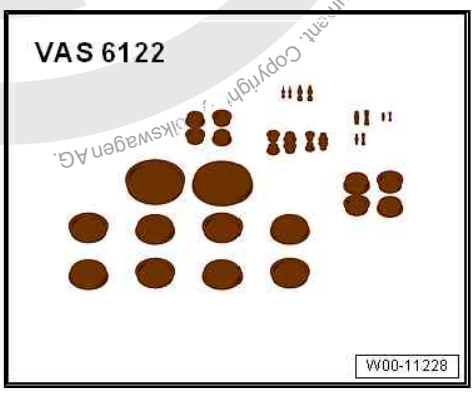
- Torque wrench - V.A.G 1410-



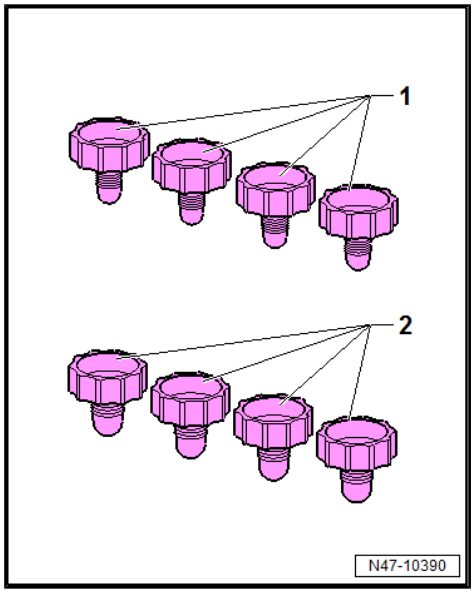
- Brake filling and bleeding equipment - VAS 6860-



- Ring spanner insert set AF 11 - V.A.G 1331/2-
- Engine bung set - VAS 6122-



- Sealing plug repair kit - 1H0 698 311 A-



Fitting locations ⇒ page 6 .

Removing:

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

– Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .

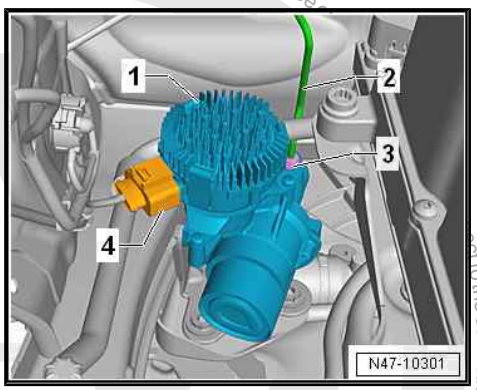
– Place sufficient lint-free cloths in the area of the brake system pressure accumulator - VX70- -1-.

– Release and disconnect connector -4- from brake system pressure accumulator - VX70- -1-.

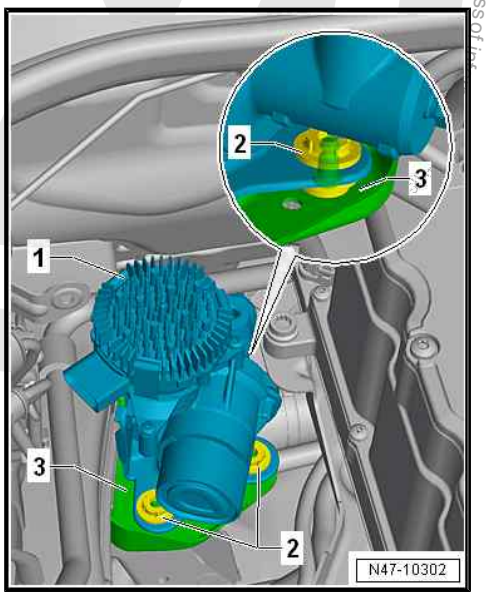
– Unscrew union nut -3- from brake system pressure accumulator - VX70- -1-.

– Remove brake line -2- from brake system pressure accumulator - VX70- -1-.

– Immediately seal brake line and threaded hole with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



– Pull brake system pressure accumulator - VX70- -1- together with rubber dampers -2- upwards off bracket -3-.



Installing:

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

– Prefill brake system pressure accumulator - VX70- ⇒ page 92 .

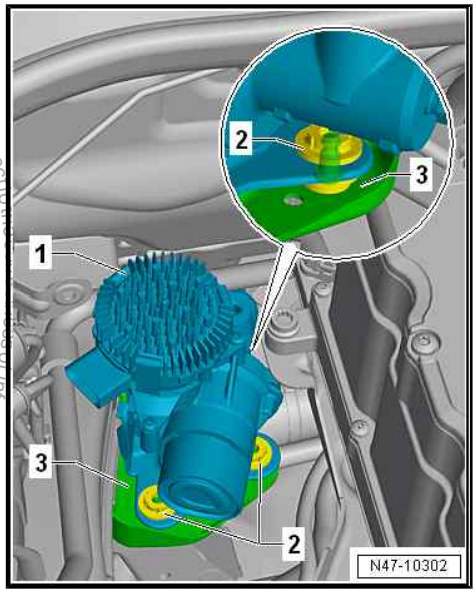
– Ensure rubber dampers -2- are seated correctly in brake system pressure accumulator - VX70- bracket ⇒ Item 3 (page 62) .

– Fit brake system pressure accumulator - VX70- -1- together with rubber dampers -2- onto bracket retaining pin -3-.

– Press brake system pressure accumulator - VX70- evenly onto retaining pins.

– Ensure that retaining pins have been fully and evenly inserted into rubber dampers.

– Check firm seating by pulling on it.



After installation, check that the brake system pressure accumulator - VX70- is firmly seated, otherwise malfunction can occur.

– Bleed brake system ⇒ page 89 .

– Subsequently bleeding the brake system ⇒ page 91 .

– Perform basic setting for electromechanical brake servo ⇒ Vehicle diagnostic tester.

Specified torques

- ⇒ “2.2 Assembly overview – brake system pressure accumulator”, page 62
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery .

2.4 Removing and installing brake servo

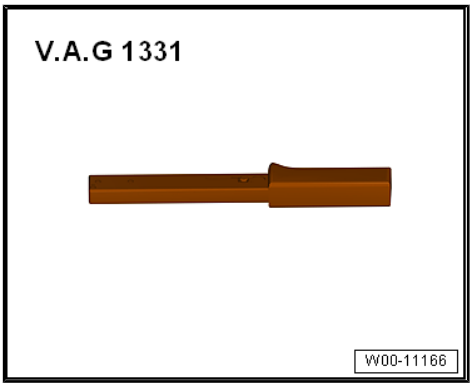
⇒ “2.4.1 Removing and installing brake servo, LHD”, page 65

⇒ “2.4.2 Removing and installing brake servo, RHD”, page 72

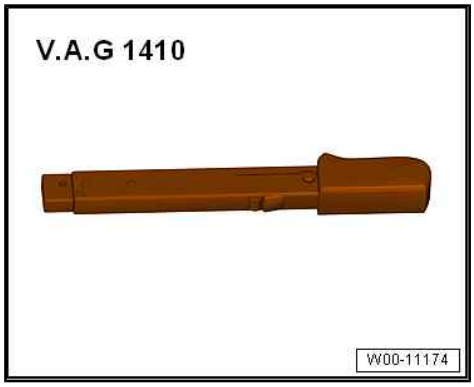
2.4.1 Removing and installing brake servo, LHD

Special tools and workshop equipment required

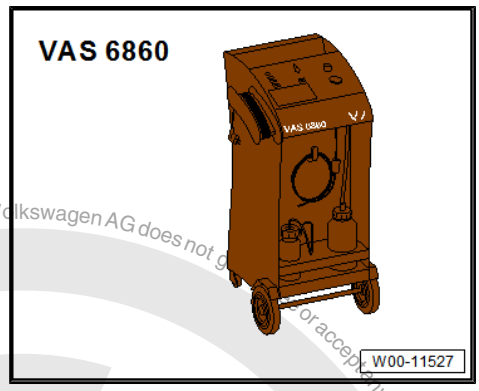
- Torque wrench - V.A.G 1331-



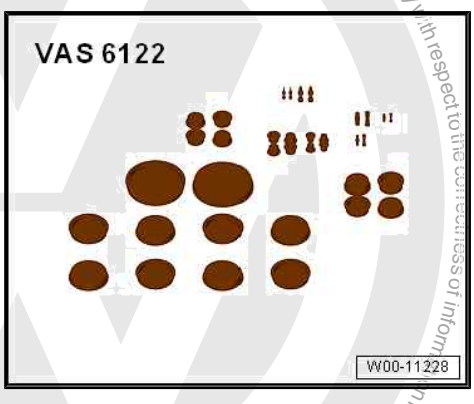
- Torque wrench - V.A.G 1410-



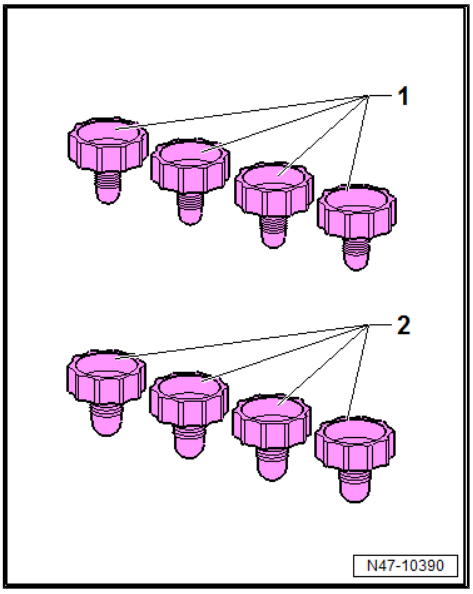
- Brake filling and bleeding equipment - VAS 6860-



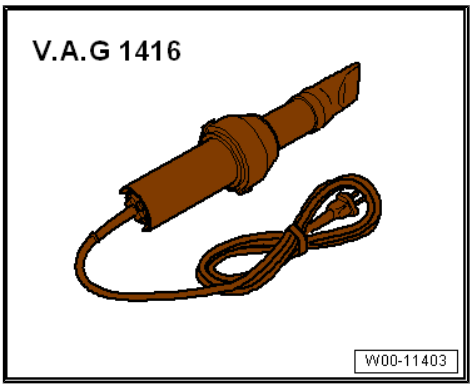
- Ring spanner insert set AF 11 - V.A.G 1331/2-
- Engine bung set - VAS 6122-



- Sealing plug repair kit - 1H0 698 311 A-



- Hot air blower, e.g. hot air blower - VAS 1978/14A-

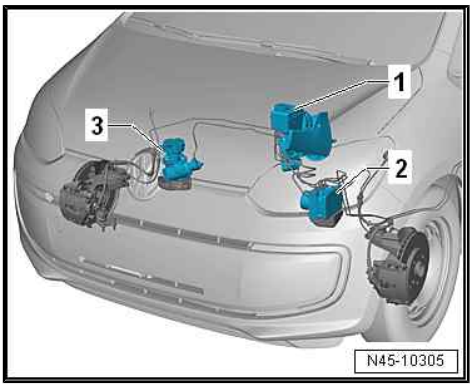


Locations:

1 - Brake servo

2 - ABS control unit - J104- and ABS hydraulic unit - N55-

3 - Brake system pressure accumulator - VX70-



Removing:

– Read and note code of brake servo control unit - J539- ⇒ Vehicle diagnostic tester.

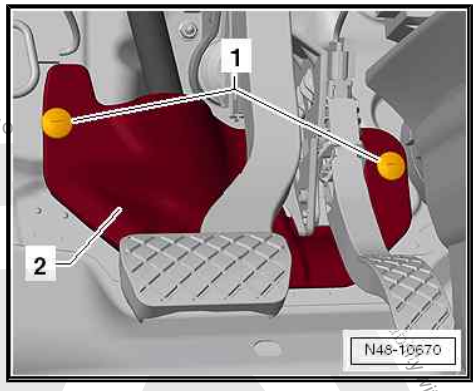
– Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

– Place sufficient lint-free cloths in area of engine, subframe and gearbox.

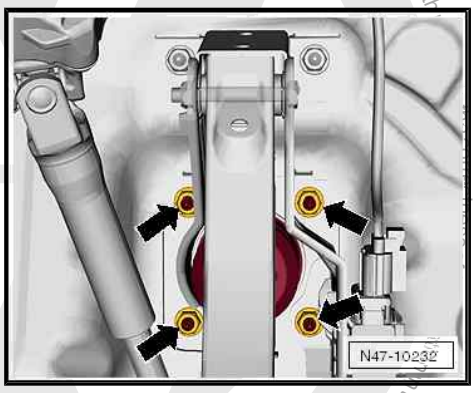
– Remove dash panel trim in driver footwell ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments and covers; Assembly overview – Dash panel trim on driver side .

– Unscrew bolts -1- and remove footwell trim -2-.



– Loosen nuts -arrows- as far as possible.

• Brake lines must not be disconnected yet.



NOTICE

Risk of damage to the plenum chamber bulkhead due to improper separation of the bonded joint.

– Never lever the brake servo off the plenum chamber bulkhead to separate the bonded joint.

Note

♦ *A second mechanic is required for further removal.*

♦ *Place a piece of foam in front of the refrigerant line to protect it from damage.*

– Depress brake pedal firmly and hold.

– Have the second mechanic grasp the brake servo and pull it towards front.

Note

♦ *By doing so, the bonded joint between the brake servo and the plenum chamber bulkhead will be separated.*

♦ *Ensure that the brake lines are not bent.*

♦ *If the bonded joint cannot be separated, the nuts must be unscrewed.*

– Separate brake pedal from brake servo ⇒ page 50 .

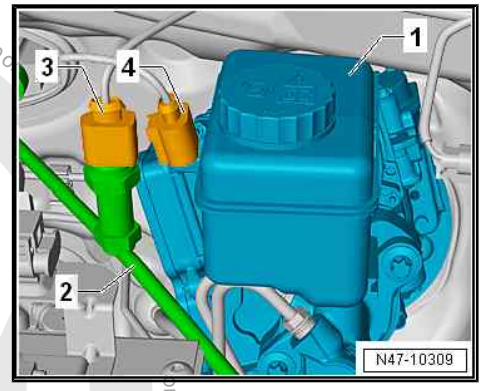
– Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .

Vehicles with air conditioner:

– Release and disconnect connector -3- for high-pressure sender - G65- from refrigerant line -2-.

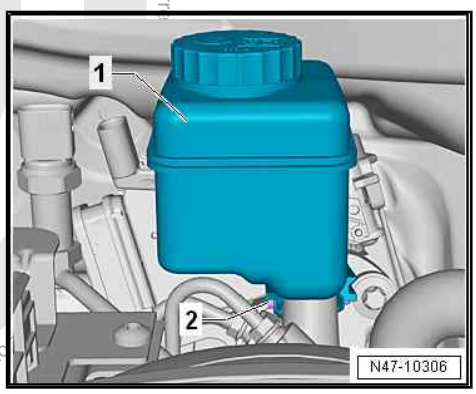
Continued for all vehicles:

– Release and disconnect connector -4- from brake fluid level warning contact - F34- at brake fluid reservoir -1-.



– Unscrew bolt -2-, and carefully pull off brake fluid reservoir -1- upwards.

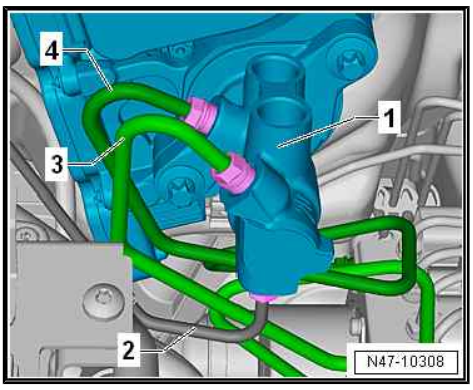
– Immediately seal open connections with suitable plugs from engine bung set - VAS 6122- .



– Mark position of brake lines -2- to -4- on brake master cylinder -1-.

– Unscrew brake lines -2- to -4- from brake master cylinder -1-.

– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .

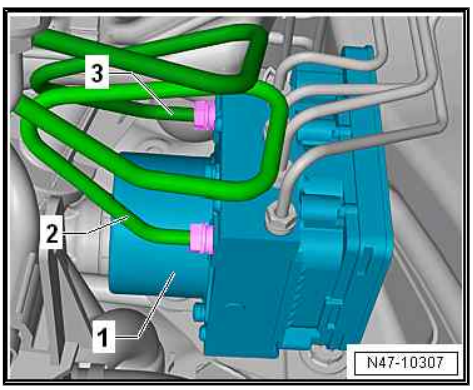


– Mark position of brake lines -2- and -3- on ABS hydraulic unit - N55- -1-.

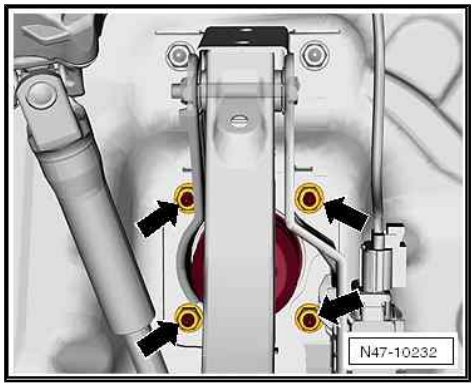
– Unscrew brake lines -2- and -3- from ABS hydraulic unit - N55- -1-.

– Remove brake lines from vehicle.

– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .

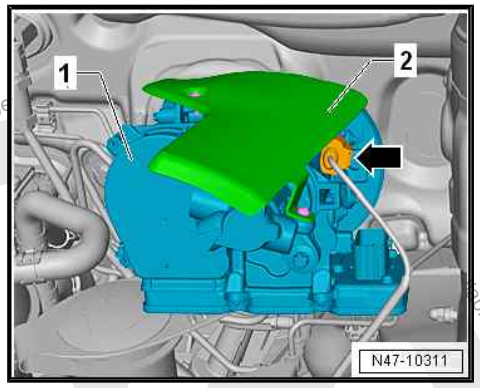


– Remove hexagon nuts -arrows-.
– If brake servo gets jammed in holes, loosen both remaining nuts on the mounting bracket ⇒ Item 3 (page 49) .
– Carefully pull brake servo off plenum chamber bulkhead.



– Carefully lay brake servo -1- to one side in engine compartment as shown in illustration.
– Release connector -arrow-, and pull it off brake servo -1-.
– If it is not possible to release the connector, loosen the heat shield -2- first.
– To do this, loosen both bolts at side ⇒ Item 16 (page 59) .

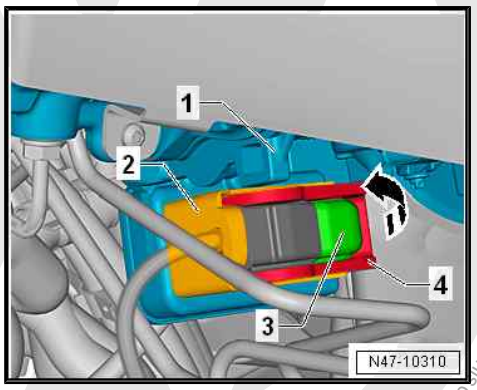
Ensure no brake fluid gets onto contacts.



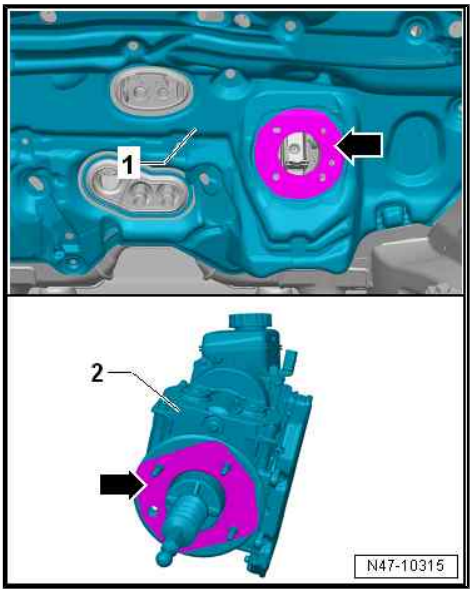
– Press release tab -3- on connector -2-.
– Release latch -4- in direction of -arrow-, and pull connector -2- off brake servo -1-.

Ensure no brake fluid gets onto contacts.

– Carefully remove brake servo from the vehicle.



– Remove adhesive residue -arrows- from brake servo -2- and plenum chamber bulkhead -1-.



WARNING

Risk of fatal injury due to electrocution. The hot air blower can excessively heat surrounding high voltage components and high voltage cables and consequently damage them.

Risk of severe or fatal injury due to electric shock.

– Protect high voltage components and high voltage cables from overheating.

– To do so, apply gentle heat from hot air blower to the adhesive residue and pull it off.

– Thoroughly clean surfaces.

Installing:

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

– Renew gasket between brake servo and bulkhead ⇒ Item 3 (page 58) .

– Carefully insert brake servo and tighten nuts hand-tight.

– Fit sealing plugs onto brake fluid reservoir ⇒ Item 11 (page 59) .

– Moisten sealing plugs ⇒ Item 11 (page 59) with brake fluid before pressing brake fluid reservoir into brake master cylinder.

– Clip brake pedal to brake servo ⇒ page 51 .

– Bleed brake system ⇒ page 89 .

– Subsequently bleeding the brake system ⇒ page 91 .

– Code brake servo control unit - J539- ⇒ Vehicle diagnostic tester.

– Perform basic setting for electromechanical brake servo ⇒ Vehicle diagnostic tester.

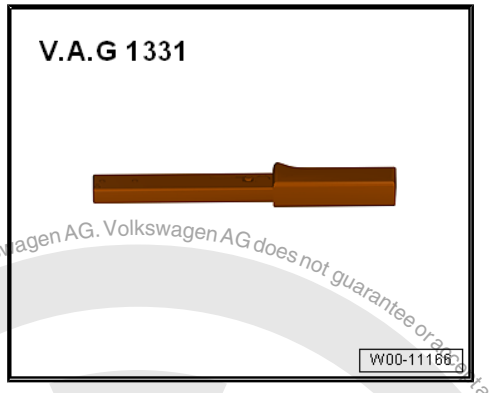
Specified torques

- ⇒ “2.1 Assembly overview - brake servo/brake master cylinder”, page 57
- ⇒ “3.1 Assembly overview”, page 10
- ⇒ “4.1 Assembly overview - brake pedal”, page 48
- ⇒ “2.2 Assembly overview – brake system pressure accumulator”, page 62
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery
- ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Assembly overview – Dash panel cover on driver side
- ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .

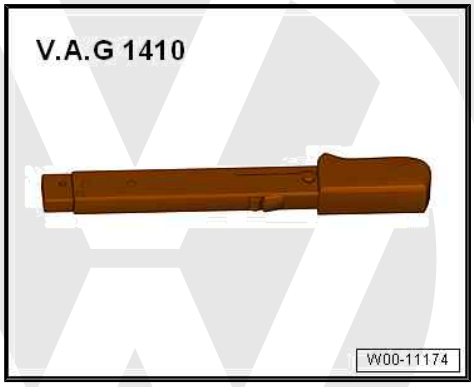
2.4.2 Removing and installing brake servo, RHD

Special tools and workshop equipment required

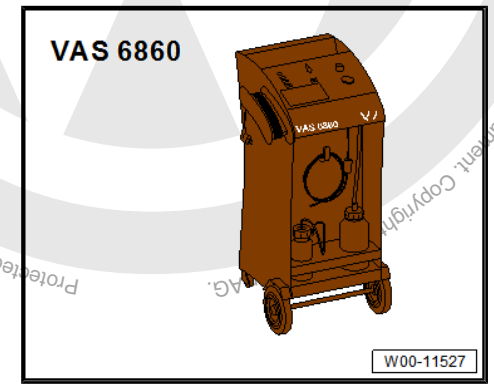
- Torque wrench - V.A.G 1331-



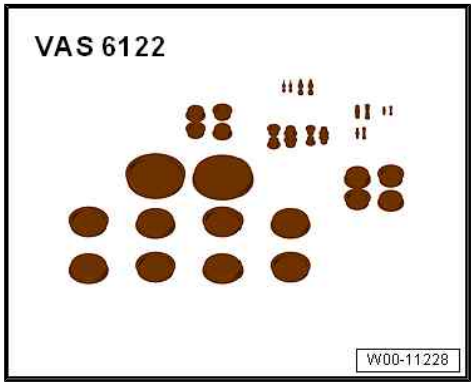
- Torque wrench - V.A.G 1410-



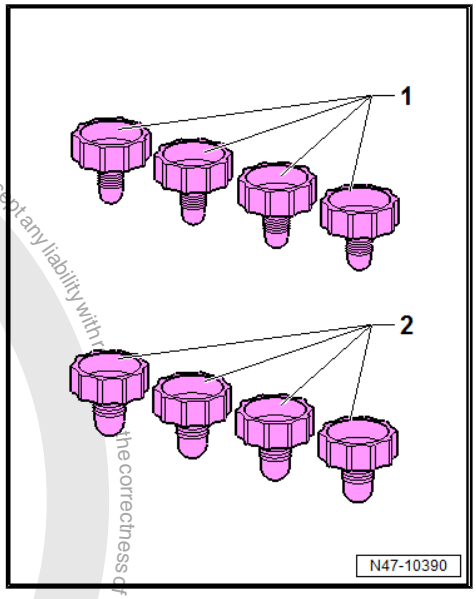
- Brake filling and bleeding equipment - VAS 6860-



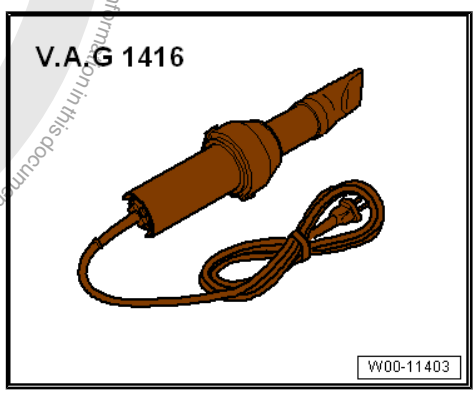
- Ring spanner insert set AF 11 - V.A.G 1331/2-
- Engine bung set - VAS 6122-



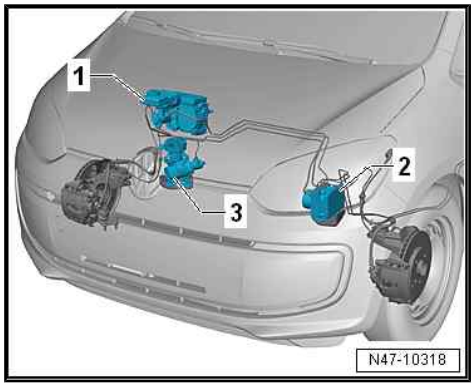
- Sealing plug repair kit - 1H0 698 311 A-



- Hot air blower, e.g. hot air blower - VAS 1978/14A-



Locations:



1 - Brake servo

2 - ABS control unit - J104- and ABS hydraulic unit - N55-

3 - Brake system pressure accumulator - VX70-

Removing:

– Read and note code of brake servo control unit - J539- ⇒ Vehicle diagnostic tester.

– Place sufficient lint-free cloths in area of engine, subframe and gearbox.

– Remove dash panel trim in driver footwell ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments and covers; Assembly overview – Dash panel trim on driver side .

– Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

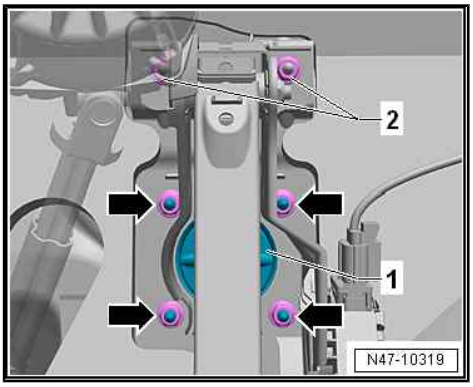
– Remove engine control unit ⇒ Rep. gr. 93 ; Engine control unit; Removing and installing engine control unit - J623- .

– Remove bracket for engine control unit ⇒ Rep. gr. 93 ; Engine control unit; Removing and installing bracket for engine control unit - J623-

– Remove power and control electronics for electric drive ⇒ Rep. gr. 93 ; Power and control electronics for electric drive; Removing and installing power and control electronics for electric drive .

– Loosen nuts -arrows- on brake servo -1- as far as possible.

• Brake lines must not be disconnected yet.



Note

A second mechanic is required for further removal.

– Depress brake pedal firmly and hold.

– Have the second mechanic grasp the brake servo and pull it towards front.

Note

♦ *By doing so, the bonded joint between the brake servo and the plenum chamber bulkhead will be separated.*

♦ *Ensure that the brake lines are not bent.*

♦ *If the bonded joint cannot be separated, the nuts must be unscrewed.*

NOTICE

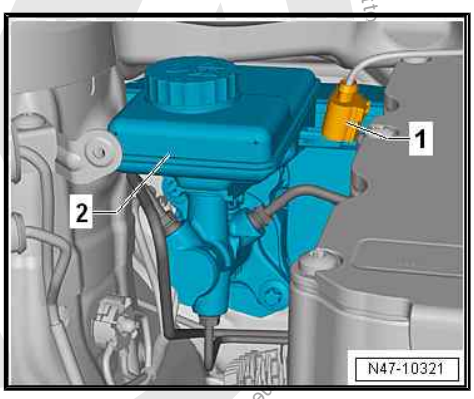
Risk of damage to the plenum chamber bulkhead due to improper separation of the bonded joint.

– Never lever the brake servo off the plenum chamber bulkhead to separate the bonded joint.

– Separate brake pedal from brake servo ⇒ page 50 .

– Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .

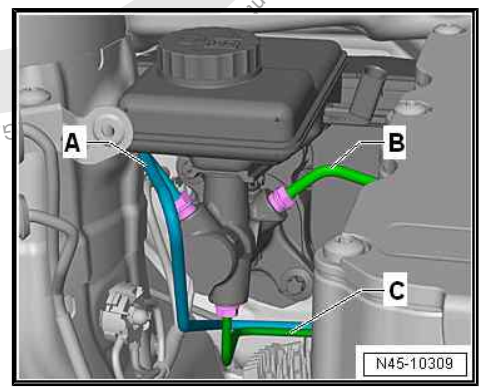
– Release and disconnect connector -1- for brake fluid level warning contact - F34- from brake fluid reservoir -2-.



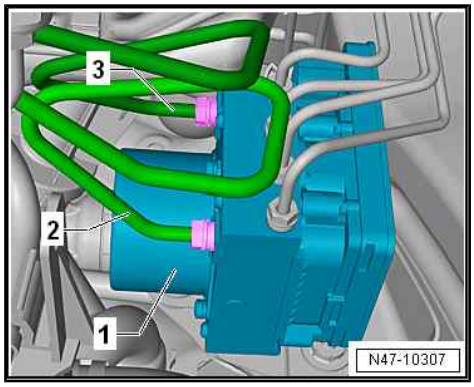
– Mark position of brake lines -A- to -C- on brake master cylinder.

– Unscrew brake lines -A- to -C- from brake master cylinder.

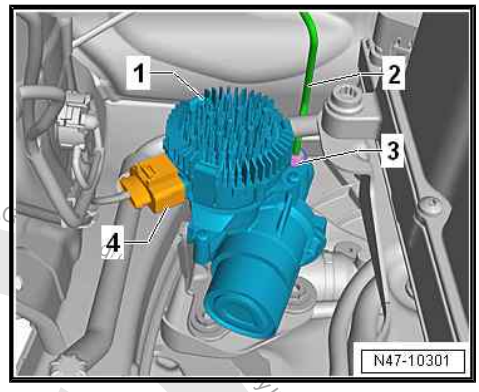
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



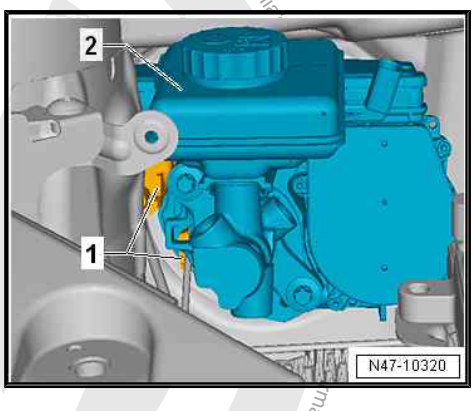
– Mark position of brake lines -2- and -3- on ABS hydraulic unit - N55- -1-.
– Unscrew brake lines -2- and -3- from ABS hydraulic unit - N55- -1-.
– Remove brake lines from vehicle.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



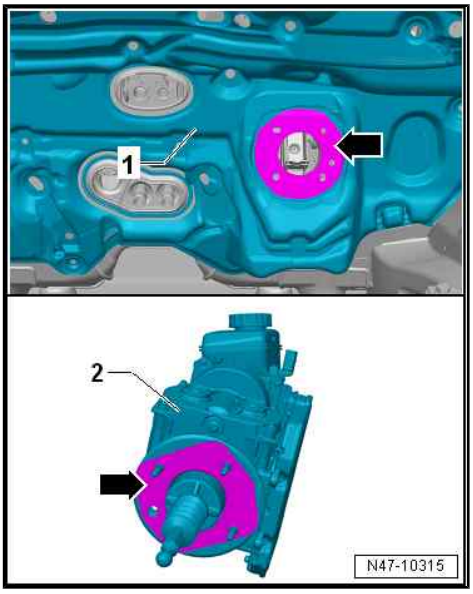
– Unscrew union nut -3- from brake system pressure accumulator - VX70- -1-.
– Remove brake line -2- from brake system pressure accumulator - VX70- -1-.
– Immediately seal brake line and threaded hole with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .
– Remove brake line from vehicle.



– Release and disconnect connector -1- from brake servo -2-.
– Carefully remove brake servo from the vehicle.



– Remove adhesive residue -arrows- from brake servo -2- and plenum chamber bulkhead -1-.



WARNING

Risk of fatal injury due to electrocution. The hot air blower can excessively heat surrounding high voltage components and high voltage cables and consequently damage them.

Risk of severe or fatal injury due to electric shock.

– Protect high voltage components and high voltage cables from overheating.

– To do so, apply gentle heat from hot air blower to the adhesive residue and pull it off.

– Thoroughly clean surfaces.

Installing:

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

– Renew gasket between brake servo and bulkhead ⇒ Item 2 (page 60) .

– Carefully insert brake servo, and tighten nuts hand-tight.

– Clip brake pedal to brake servo ⇒ page 51 .

– Bleed brake system ⇒ page 89 .

– Subsequently bleeding the brake system ⇒ page 91 .

– Code brake servo control unit - J539- ⇒ Vehicle diagnostic tester.

– Perform basic setting for electromechanical brake servo ⇒ Vehicle diagnostic tester.

Specified torques

- ⇒ “2.1 Assembly overview - brake servo/brake master cylinder”, page 57
- ⇒ “3.1 Assembly overview”, page 10
- ⇒ “4.1 Assembly overview - brake pedal”, page 48
- ⇒ “2.2 Assembly overview – brake system pressure accumulator”, page 62
- ⇒ Rep. gr. 93 ; Power and control electronics for electric drive; Assembly overview - power and control electronics for electric drive
- ⇒ Rep. gr. 93 ; Engine control unit; Assembly overview - engine control unit
- ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Assembly overview – Dash panel cover on driver side
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery
- ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Assembly overview - steering column .

2.5 Removing and installing brake master cylinder

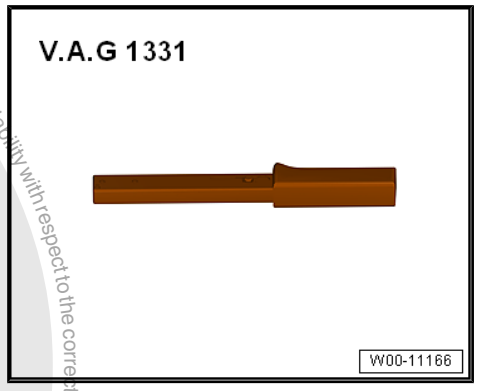
⇒ “2.5.1 Removing and installing brake master cylinder, left-hand drive”, page 78

⇒ “2.5.2 Removing and installing brake master cylinder, RHD”, page 81

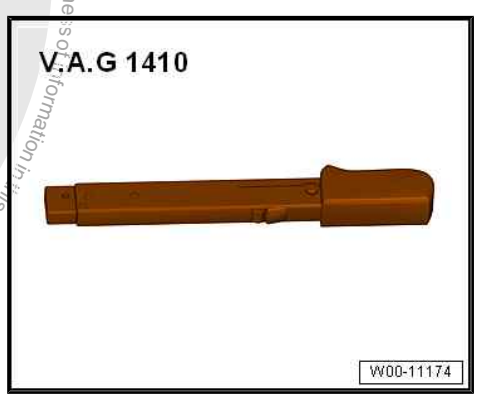
2.5.1 Removing and installing brake master cylinder, left-hand drive

Special tools and workshop equipment required

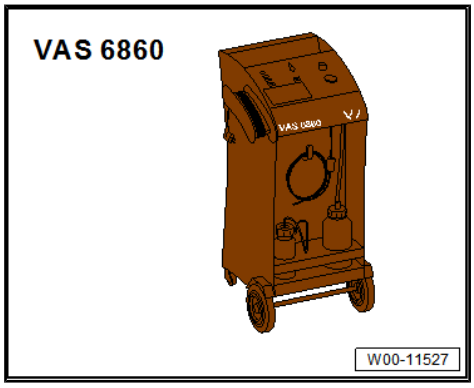
- Torque wrench - V.A.G 1331-



- Torque wrench - V.A.G 1410-

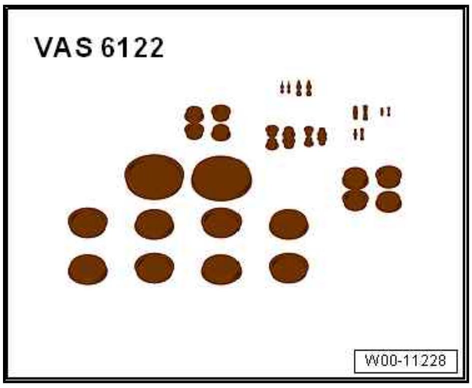


- Brake filling and bleeding equipment - VAS 6860-

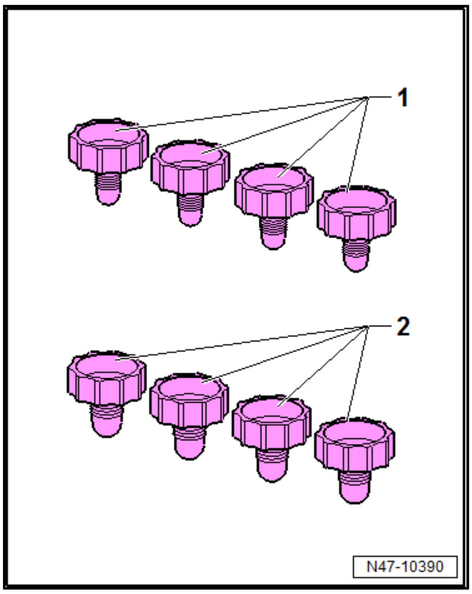


- Ring spanner insert set AF 11 - V.A.G 1331/2-

- Engine bung set - VAS 6122-



- Sealing plug repair kit - 1H0 698 311 A-



Removing:

– Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

– Place sufficient lint-free cloths in area of engine, subframe and gearbox.

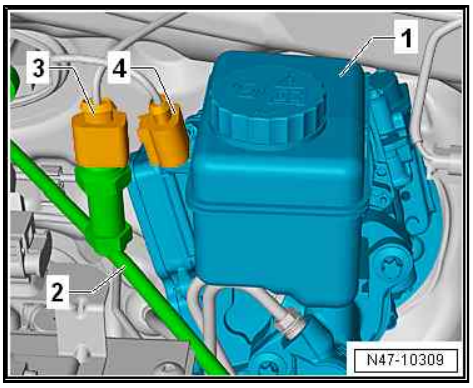
– Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .

Vehicles with air conditioner:

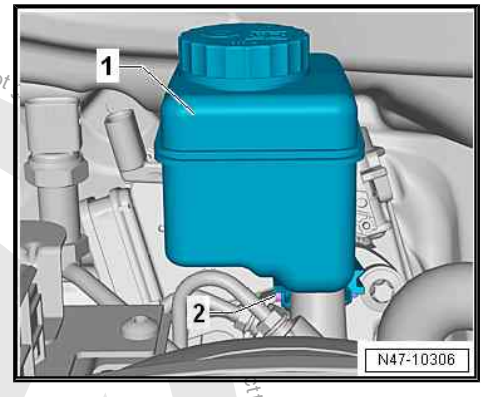
– Release and disconnect connector -3- for high-pressure sender - G65- from refrigerant line -2-.

Continued for all vehicles:

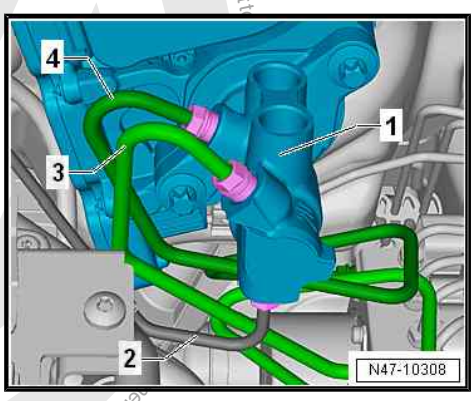
– Release and disconnect connector -4- from brake fluid level warning contact - F34- at brake fluid reservoir -1-.



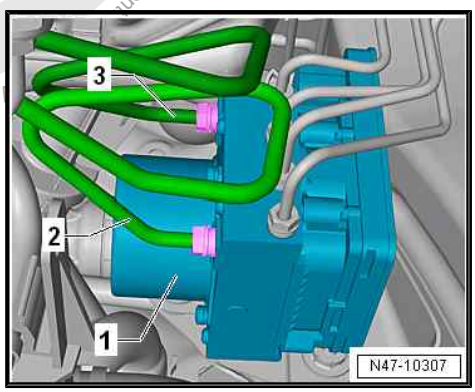
– Unscrew bolt -2-, and carefully pull off brake fluid reservoir -1- upwards.



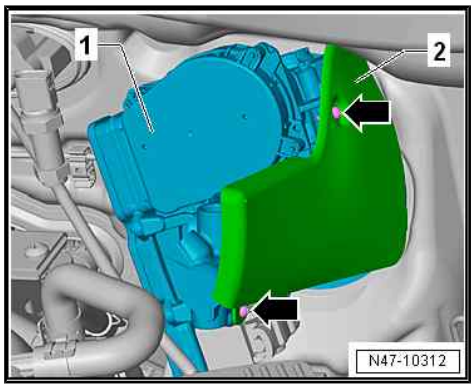
– Mark position of brake lines -2- to -4- on brake master cylinder -1-.
– Unscrew brake lines -2- to -4- from brake master cylinder -1-.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .

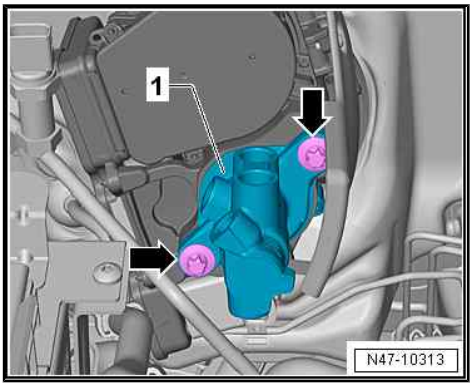


– Mark position of brake lines -2- and -3- on ABS hydraulic unit - N55- -1-.
– Unscrew brake lines -2- and -3- from ABS hydraulic unit - N55- -1-.
– Remove brake lines from vehicle.
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



– Unscrew bolts -arrows- for heat shield -1-.





– Remove bolts -arrows-
– Carefully take brake master cylinder -1- out of brake servo.

Installing:

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

– Thoroughly clean threaded hole for bolts ⇒ Item 8 (page 59) .
– When assembling brake master cylinder with brake servo, make sure plunger rod is properly positioned in brake master cylinder.
– When assembling brake master cylinder with brake servo, make sure seal ⇒ Item 5 (page 58) is seated correctly.
– Fit sealing plugs onto brake fluid reservoir ⇒ Item 11 (page 59) .
– Moisten sealing plugs ⇒ Item 11 (page 59) with brake fluid before pressing brake fluid reservoir into brake master cylinder.
– Bleed brake system ⇒ page 89 .
– Subsequently bleeding the brake system ⇒ page 91 .
– Perform basic setting for electromechanical brake servo ⇒ Vehicle diagnostic tester.

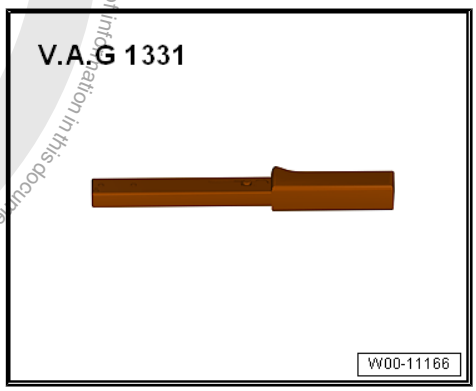
Specified torques

- ⇒ “2.1 Assembly overview - brake servo/brake master cylinder”, page 57
- ⇒ “3.1 Assembly overview”, page 10
- ⇒ “2.2 Assembly overview – brake system pressure accumulator”, page 62
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery

2.5.2 Removing and installing brake master cylinder, RHD

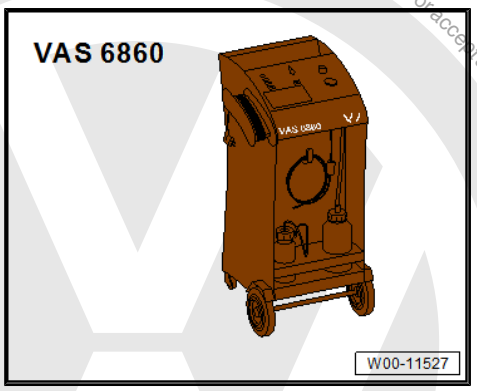
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Torque wrench - V.A.G 1410-

- Brake filling and bleeding equipment - VAS 6860-



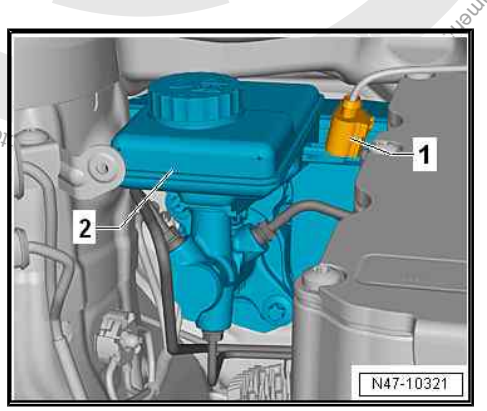
- Ring spanner insert set AF 11 - V.A.G 1331/2-

Removing:

– Place sufficient lint-free cloths in area of engine, subframe and gearbox.

– Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 6860- .

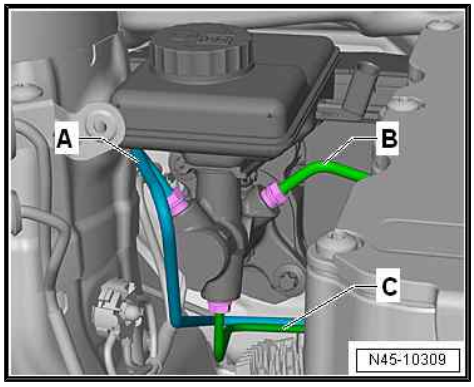
– Release and disconnect connector -1- for brake fluid level warning contact - F34- from brake fluid reservoir -2-.



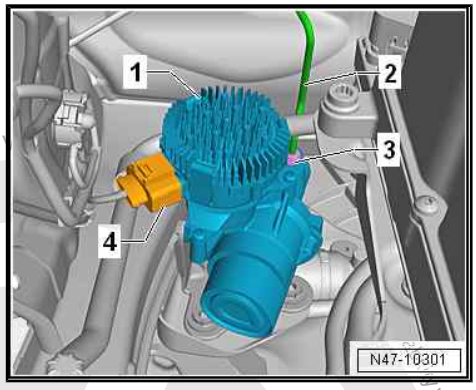
– Mark position of brake lines -A- to -C- on brake master cylinder.

– Unscrew brake lines -A- to -C- from brake master cylinder.

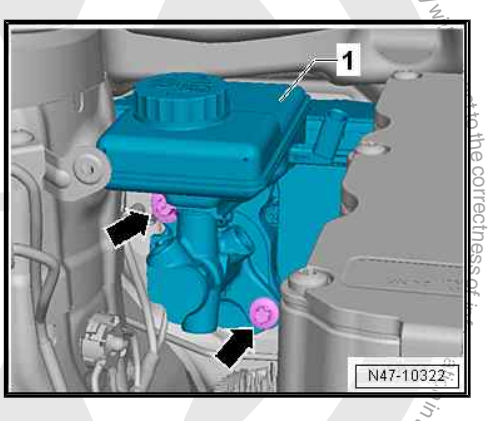
– Immediately seal brake lines and open connections with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .



– Unscrew union nut -3- from brake system pressure accumulator - VX70- -1-.
– Remove brake line -2- from brake system pressure accumulator - VX70- -1-.
– Immediately seal brake line and threaded hole with sealing plugs from repair kit - 1H0 698 311 A- or suitable plugs from engine bung set - VAS 6122- .
– Remove brake line from vehicle.



– Remove bolts -arrows-
– Carefully take brake master cylinder -1- out of brake servo.



Installing:

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

– Thoroughly clean threaded hole for bolts ⇒ Item 6 (page 60) .
– When assembling brake master cylinder with brake servo, make sure plunger rod is properly positioned in brake master cylinder.
– When assembling brake master cylinder with brake servo, make sure seal is properly seated ⇒ Item 11 (page 61) .
– Bleed brake system ⇒ page 89 .
– Subsequently bleeding the brake system ⇒ page 91 .
– Perform basic setting for electromechanical brake servo ⇒ Vehicle diagnostic tester.

Specified torques

- ⇒ “2.1 Assembly overview - brake servo/brake master cylinder”, page 57
- ⇒ “2.2 Assembly overview – brake system pressure accumulator”, page 62

3 Brake lines

⇒ “3.1 Repairing brake lines”, page 84

3.1 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.

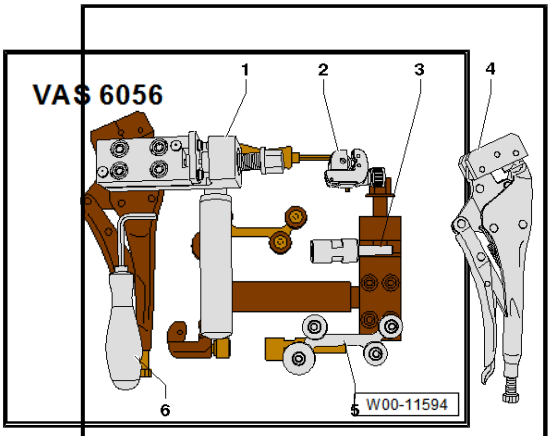
The use of flanging tools - V.A.G. 1356- is not permitted due to the coating and the diameter of the black brake lines.

Note

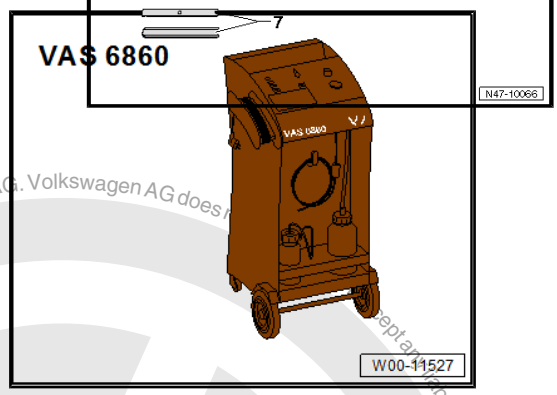
- *Brake pipes may only be bent up to max. 90°.*
- *The lines will otherwise become kinked or reveal deformations which impermissibly constrict the line cross-section.*
- *Preferably separate brake lines at underbody.*
- *The positions of the intermediate pieces must be selected so that they cannot chafe 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!

3.1.1 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

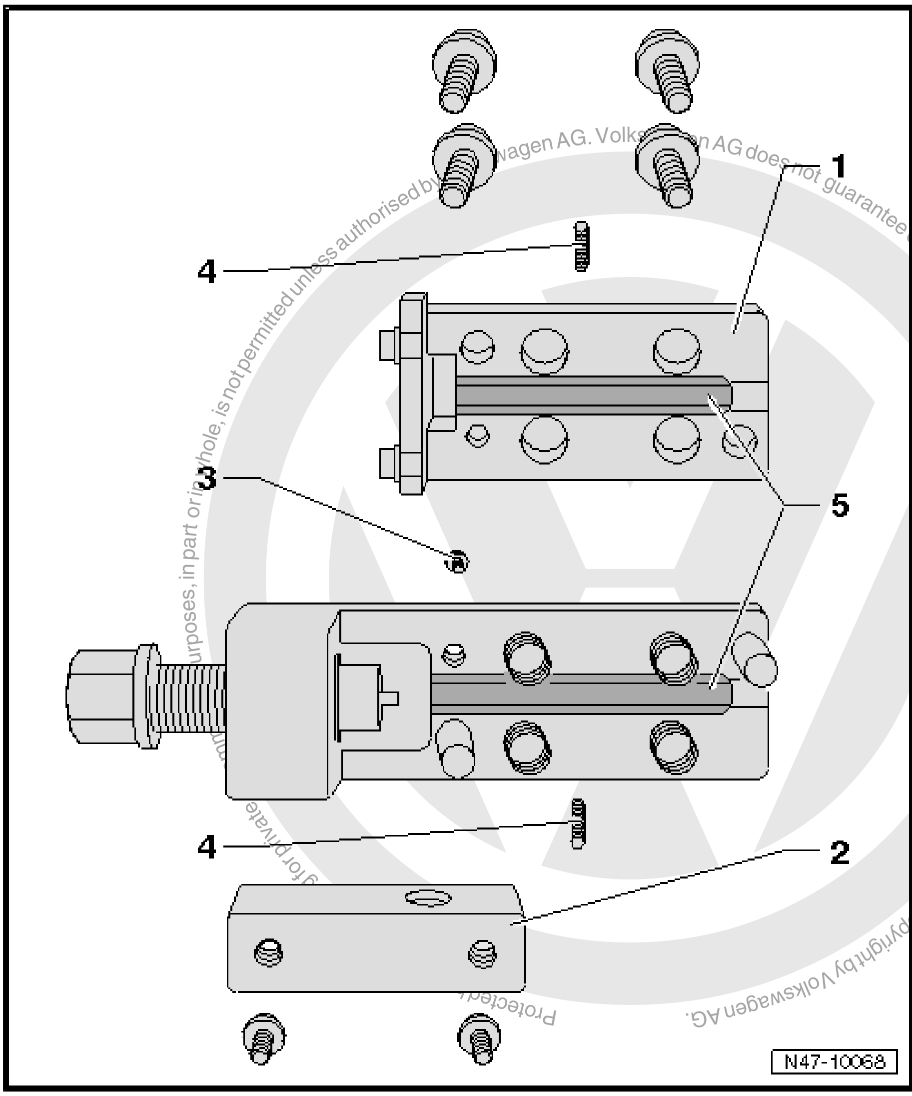
❑ For centring and holding flanging jaws

❑ Allen head bolt, 2 mm

5 - Flanging jaws

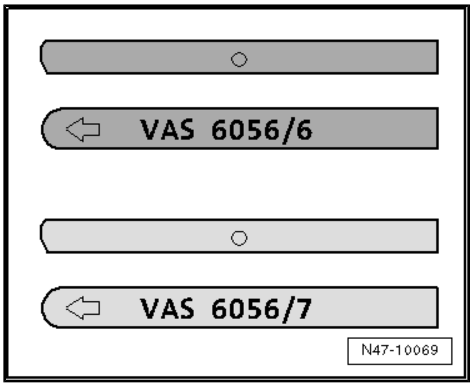
❑ Various.

❑ Assembly instructions ⇒ page 86 .



Flanging jaw assembly instructions:

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



Note

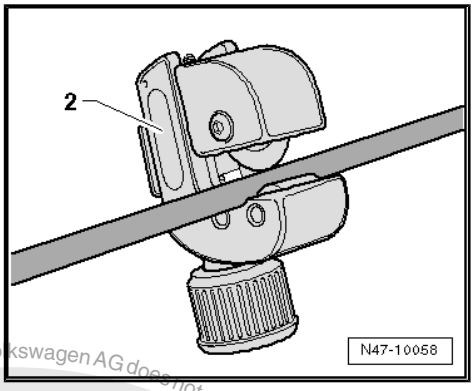
- *Arrow on rounded side of flanging jaws must point to edge of housing.*
- *Straight side of flanging jaws must be installed to spindle, as flanging head is not otherwise formed correctly.*

3.1.2 Work instructions

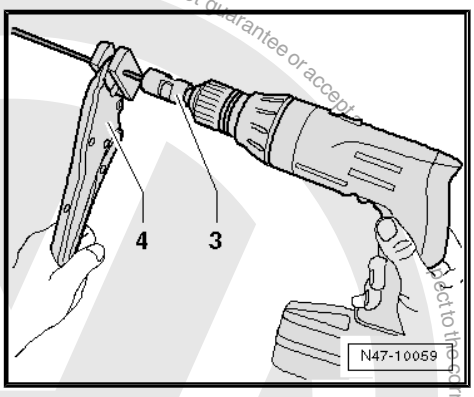
– Unbolt respective brake line from brake caliper or wheel brake cylinder.

– Catch escaping brake fluid and dispose of this as per regulations.

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



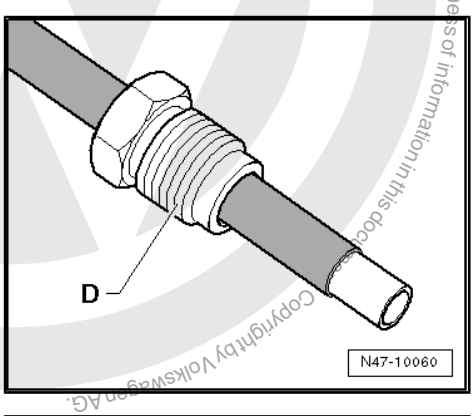
– Clamp brake line in set of grips -4- so that approx. 50 mm project from plastic jaws.
– Clamp scraper -3- into a drill and position onto brake line.
– At slow drill speed and with gentle pressure on brake line, scrape coating off brake line.



Note

Length of scraping is determined by stop in scraper.

– Remove scraper from brake line and remove scraping residues.
– Remove set of grips and slide union bolt -D- onto brake line.

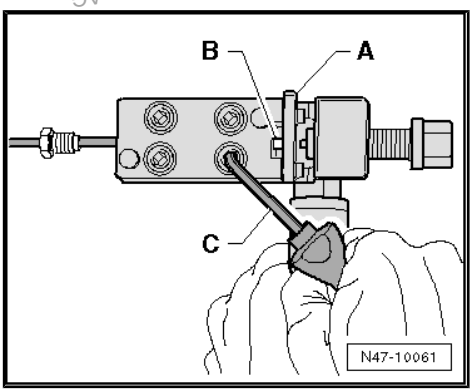


– Slide brake line -B- to stop -A- in flanging tool.

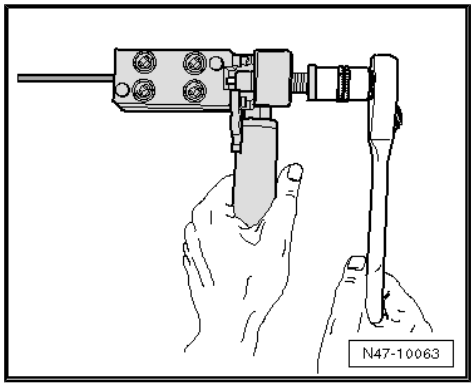
Note

Brake line must be positioned against stop when the hexagon socket head bolts are tightened, or the flange will not be formed correctly.

– Pre-tension brake line in flanging tool until brake line can no longer be moved.
– Fold up stop -A-.
– Tighten hexagon socket head bolts diagonally using angle screw driver -C-.



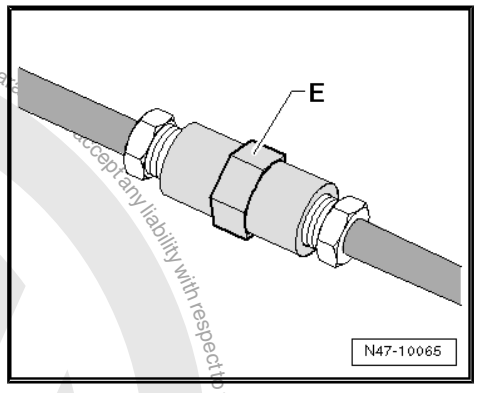
– Turn spindle to stop in flanging tool.
– Turn spindle back again.
– Undo Allen head bolts alternately in diagonal sequence.
– Remove brake line from flanging tool.
– Check and clean brake line and flange.



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 89 .



4 Hydraulic system

4.1 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.*

4.1.1 Changing brake fluid

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

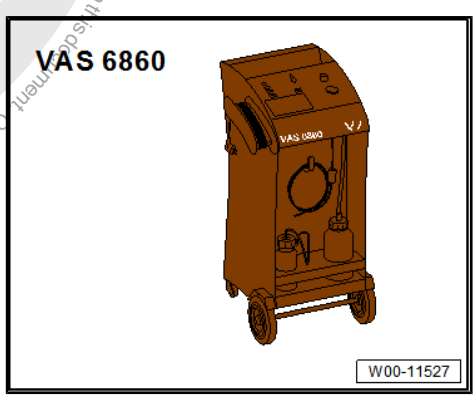
4.2 Bleeding hydraulic system following standard procedure

The bleeding process for the brake system is described using the brake filling and bleeding equipment - VAS 6860- .

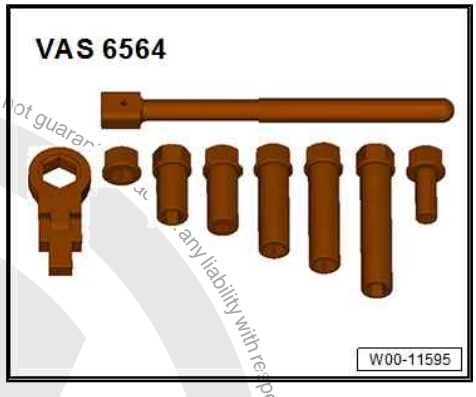
A pre-pressure of 2 bar is required for bleeding the hydraulic unit.

Special tools and workshop equipment required

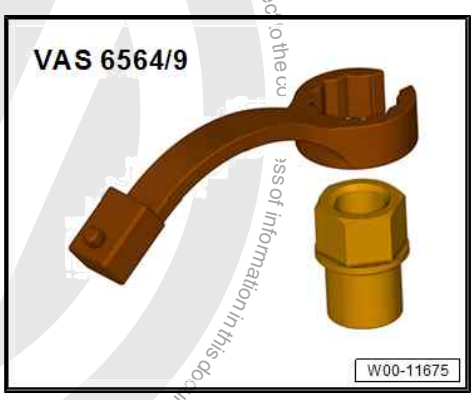
- Brake filling and bleeding equipment - VAS 6860-



- Tool set for brake bleeding - VAS 6564-



- Tool attachment - VAS 6564/9-



Adhere strictly to work sequence when bleeding brake system.

– Connect brake filling and bleeding equipment - VAS 6860- .

– Open bleeder valves in specified order and bleed wheel brake cylinders/brake calipers.

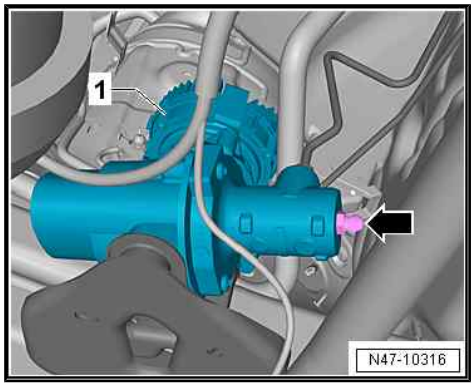
1 - Rear right wheel brake cylinder

2 - Rear left wheel brake cylinder

3 - Front right brake caliper

4 - Front left brake caliper

5 - Brake system pressure accumulator - VX70-



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.

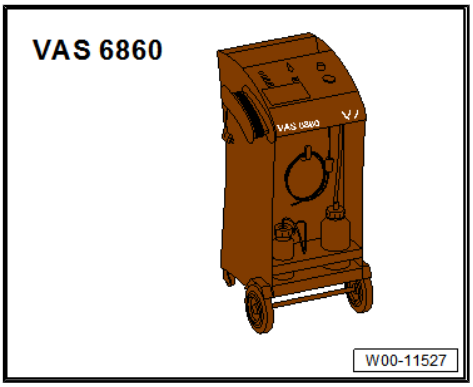
4.3 Subsequent bleeding of hydraulic system

The bleeding process for the brake system is described using the brake filling and bleeding equipment - VAS 6860- .

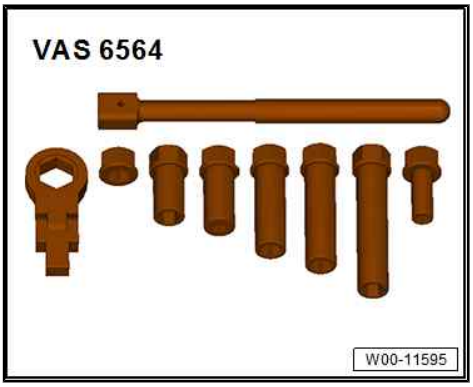
A pre-pressure of 2 bar is required for bleeding the hydraulic unit.

Special tools and workshop equipment required

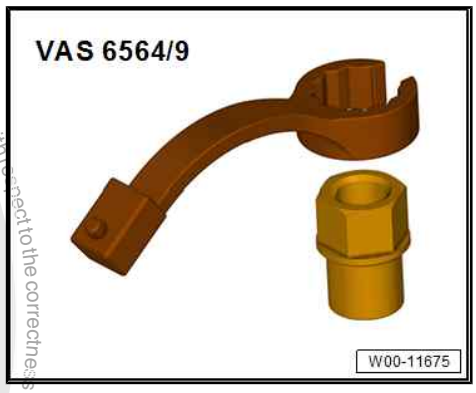
- Brake filling and bleeding equipment - VAS 6860-



- Tool set for brake bleeding - VAS 6564-



- Tool attachment - VAS 6564/9-



Carry out subsequent bleeding when:

Brake pedal travel is too long, or in the case of so-called »soft brake pedal«

Subsequent bleeding requires the assistance of a second mechanic.

– Connect brake filling and bleeding equipment - VAS 6860-.
– Depress brake pedal firmly and hold.
– Open bleeder valve on wheel brake cylinder/brake caliper.
– Fully depress brake pedal.

– Close bleed valve with pedal held down.

– Release brake pedal slowly.

This bleed sequence must be carried out 5 times per brake caliper.

Bleeding sequence:

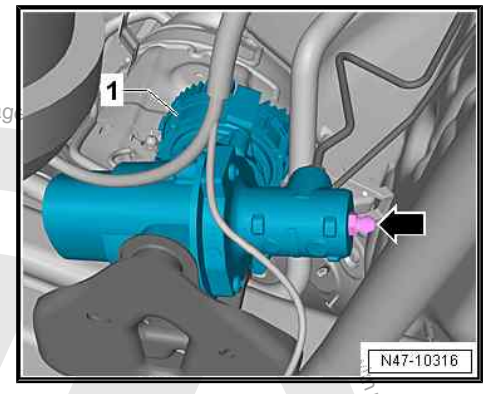
1 - Rear right wheel brake cylinder

2 - Rear left wheel brake cylinder

3 - Front right brake caliper

4 - Front left brake caliper

5 - Brake system pressure accumulator - VX70-

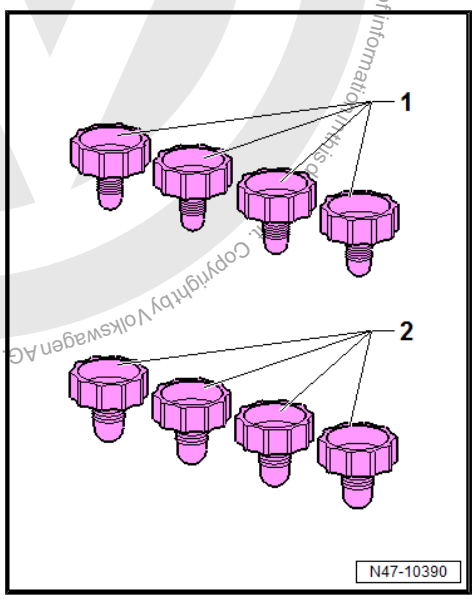


A road test must be carried out after the brakes have been bled. When doing this an ABS regulation must be performed at least once!

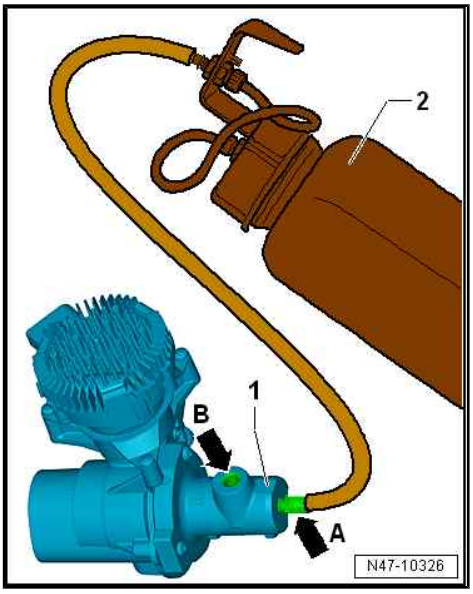
4.4 Pre-bleeding brake system pressure accumulator - VX70-

Special tools and workshop equipment required

♦ Sealing plug repair kit - 1H0 698 311 A-



– Connect commercially available bleeder bottle -2- to brake system pressure accumulator - VX70- -1- using suitable bleeder hose.
– Open bleeder valve -arrow A-.
– Fill in brake fluid until it flows bubble-free out of threaded hole -arrow B-.
– Close bleeder valve -arrow A-.
– Seal threaded hole -arrow B- using sealing plugs from repair kit - 1H0 698 311 A- .
– Install brake system pressure accumulator - VX70- ⇒ page 62 .



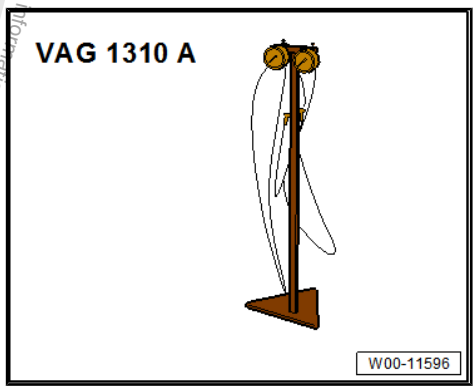
4.5 Leakage test:

⇒ “4.5.1 Checking hydraulic system for leaks”, page 93
⇒ “4.5.2 Checking wheel brake cylinder for leaks”, page 94

4.5.1 Checking hydraulic system for leaks

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:

Test procedure:

– 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 89 .

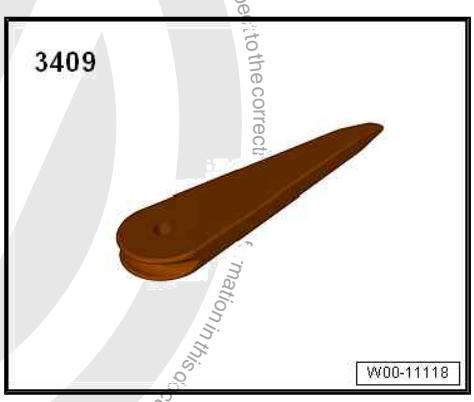
Specified torque:

- Front bleeder valves
  ⇒ “1.1 Assembly overview – front brake caliper”, page 54

4.5.2 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.