Workshop Manual

Rapid NH 2013 ➤
Rapid NH 2014 ➤

Brake systems

Edition 07.2017

List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

45 - Anti-lock brake system

46 - Brakes - mechanism

47 - Brakes - hydraulics

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

Contents

00 - Technical data 1
1 Safety instructions 1
1.1 Safety precautions when working on vehicles with start-stop system 1
1.2 Safety precautions during road tests in which testing and measuring equipment is used . . 1
2 Identification 2
2.1 PR number assignment – brake 2
3 Technical data 3
3.1 Technical data for brakes 3
4 Brake inspection 6
4.1 General points 6
4.2 Checking vehicles with front-wheel drive 6
45 - Anti-lock brake system 7
1 General points 7
1.1 Repair instructions for repair work on ABS 7
2 Installation location overview 11
2.1 Installation location overview - ABS 11
2.2 Installation location overview - ABS/ESC 13
3 Control unit and hydraulic unit 15
3.1 Exploded view – control unit and hydraulic unit 15
3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 25
3.3 Disconnecting the control unit from the hydraulic unit 32
3.4 Fitting the control unit to the hydraulic unit 34
4 Sensors 36
4.1 Removing and installing front speed sensors G45 / G47 36
4.2 Removing and installing the rear speed sensors G44 / G46 36
46 - Brakes - mechanism 38
1 Front brakes 38
1.1 Assembly overview - front brakes 38
1.2 Removing and installing brake pads 41
1.3 Removing and installing brake caliper 46
2 Rear brakes 52
2.1 Assembly overview - rear brakes 52
2.2 Removing and installing brake pads 58
2.3 Removing and installing brake caliper 61
2.4 Resetting brake 63
2.5 Removing and installing brake anchor plate 64
2.6 Removing and installing wheel-brake cylinder 65
2.7 Removing and installing brake shoes 66
3 Handbrake 71
3.1 Assembly overview - parking brake 71
3.2 Adjusting parking brake 72
3.3 Removing and installing the rear handbrake cable 74
4 Brake pedal 78
4.1 Assembly overview - brake pedal 78
4.2 Removing and installing bearing bracket 84
4.3 Separating brake pedal from brake servo 87
4.4 Clipping the brake pedal onto the brake servo unit 88
4.5 Removing and installing brake pedal 88
47 - Brakes - hydraulics 90

1 Front brake calipers 90
1.1 Summary of components - front brake caliper 90
1.2 Removing and installing brake caliper piston 93
2 Rear brake caliper 98
2.1 Summary of components - rear brake caliper 98
2.2 Removing and installing brake caliper piston 99
3 Brake servo unit and master brake cylinder 101
3.1 Summary of components - brake servo unit and master brake cylinder 101
3.2 Check the operation of the brake servo unit 104
3.3 Removing and installing brake light switch 105
3.4 Checking the master brake cylinder for tightness 105
3.5 Removing and installing master brake cylinder 106
3.6 Removing and installing brake servo 114
4 Vacuum system 138
4.1 Exploded view – vacuum pump 138
4.2 Checking the non-return valve 140
4.3 Checking the vacuum system 140
4.4 Connecting vacuum gauge for brake servo VAS 6721 140
4.5 Checking vacuum generation 141
4.6 Checking for leaks 142
4.7 Vacuum generation with manual vacuum pump VAS 6213 143
4.8 Removing and installing the pressure sensor for the brake servo unit 144
4.9 Removing and installing vacuum sensor G608 144
4.10 Removing and installing electric vacuum pump 145
5 Brake lines 147
5.1 Repairing brake lines 147
6 Hydraulic system 152
6.1 General notes on brake fluid 152
6.2 Prebleeding the hydraulic system 152
6.3 Bleeding hydraulic system following standard procedure 153
6.4 Subsequent bleeding of hydraulic system 154
6.5 Testing leak-tightness 155

00 – Technical data

1 Safety instructions

(SRL001107; Edition 07.2017)

⇒ "1.1 Safety precautions when working on vehicles with start-stop system", page 1

⇒ "1.2 Safety precautions during road tests in which testing and measuring equipment is used", page 1

1.1 Safety precautions when working on vehicles with start-stop system

When working on vehicles with start/stop system, please observe the following instructions:

CAUTION

Risk of injury as a result of automatic engine start in vehicles with start/stop system.

- In vehicles with the start/stop system activated (identifiable by an indication in the dash panel insert) the engine can start automatically if required.
- Make sure that the start-stop system is deactivated when carrying out work on the vehicle (switch ignition off, if necessary switch ignition on again).

1.2 Safety precautions during road tests in which testing and measuring equipment is used

Note the following if testers and measuring instruments have to be used during a road test:

WARNING

There is a risk of accident from deflection and insufficient securing of testers and measuring instruments.

- Using testers and measuring instruments during driving operation causes distraction.
- There is an increased risk of injury from unsecured testers and measuring instruments.
- Always attach the testing and measurement equipment to the rear seat.
- Always have the testing and measurement equipment operated by a 2nd person.
- Always operate the testing and measurement equipment from the rear seat.
- Do not operate the testing and measurement equipment from the front passenger seat.
- Persons can be injured by the release of the passenger airbag in the event of an accident.

2 Identification

⇒ “2.1 PR number assignment – brake”, page 2

2.1 PR number assignment – brake

The brake type installed in the vehicle is indicated by PR numbers.

The PR numbers are indication on the vehicle data sticker in the luggage compartment floor as well as in the Service Schedule. Information about the installed brakes can be found in the ELSA Pro vehicle data system.

Assignment is dependent on the engine type ⇒ Electronic Catalogue of Original Parts .

3 Technical data

⇒ “3.1 Technical data for brakes”, page 3

3.1 Technical data for brakes

⇒ “3.1.1 Master brake cylinder and brake servo”, page 3

⇒ “3.1.2 Front brakes”, page 3

⇒ “3.1.3 Rear brake”, page 4

⇒ “3.1.4 Brake fluid”, page 4

3.1.1 Master brake cylinder and brake servo

Assignment is dependent on the engine type ⇒ Electronic Catalogue of Original Parts .

Master brake cylinder - ∅	mm	20.64	
Brake servo unit - ∅	Inch	Left-hand drive:	10
		Right-hand drive:	7"/8"

3.1.2 Front brakes

Assignment is dependent on the engine type ⇒ Electronic Catalogue of Original Parts .

Explanations concerning PR Numbers
⇒ “2.1 PR number assignment – brake”, page 2 .

Front brake FS-III

Front brake caliper (type denomination)		FS-III
PR number		**1ZG**
Front brake caliper, piston - ∅	mm	54.0
Front brake disc – ∅	mm	256.0
Brake disc, thickness	mm	22.0
Brake disc, minimum thickness	mm	19.0
Pad thickness with supporting plate	mm	19.6
Minimum pad thickness without supporting plate	mm	2.0

Front brake FN3

Front brake caliper (type denomination)		FN3
PR number		**1ZC**
Front brake caliper, piston - ∅	mm	54.0
Front brake disc – ∅	mm	288.0
Brake disc, thickness	mm	25.0
Brake disc, minimum thickness	mm	22.0

Front brake caliper (type denomination)		FN3
PR number		**1ZC**
Pad thickness with supporting plate	mm	20.6
Minimum pad thickness without supporting plate	mm	2.0

3.1.3 Rear brake

Assignment is dependent on the engine type ⇒ Electronic Catalogue of Original Parts .

Explanations concerning PR Numbers
⇒ “2.1 PR number assignment – brake”, page 2 .

Rear disc brake C 38

Rear brake caliper (type denomination)		C 38
PR number		**1KT**
Rear brake caliper, piston - ∅	mm	38
Rear brake disc – ∅	mm	230
Brake disc, thickness	mm	9
Brake disc, minimum thickness	mm	7
Pad thickness with supporting plate	mm	16.9
Minimum pad thickness without supporting plate	mm	2.0

Rear drum brake

Rear drum brake		
PR number		**1KL**
Brake drum - diameter ∅	mm	228
Wheel-brake cylinder - ∅	mm	19.05
Brake pad, width	mm	32
Pad thickness without supporting shoe	mm	4.4
Minimum pad thickness without supporting shoe	mm	1.0

3.1.4 Brake fluid

Classification	Only use new original brake fluid N.052.766.Z0 as per US standard FMVSS 571.116, DOT 4 and VW standard 501 14
Top-up	⇒ Maintenance ; Booklet Rapid NH

4 Brake inspection

⇒ “4.1 General points”, page 6

⇒ “4.2 Checking vehicles with front-wheel drive”, page 6

4.1 General points

- The test stand is used as drive.
- During the testing, the idling speed must be set on vehicles with manual gearbox and the driving position »N« must be engaged on vehicles with automatic gearbox.
- 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 test speed must not exceed 6 km/h.

The test stands approved by Škoda comply with these conditions.

45 – Anti-lock brake system

1 General points

⇒ "1.1 Repair instructions for repair work on ABS", page 7

1.1 Repair instructions for repair work on ABS

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

- ABS
- ABS/ESC

The ABS brake system is split diagonally. Brake servo assistance is provided pneumatically by the vacuum brake servo.

Vehicles fitted with ABS do not have a mechanical brake pressure regulator. Specifically matched software in the ABS control unit - J104- regulates the brake pressure distribution on the rear axle.

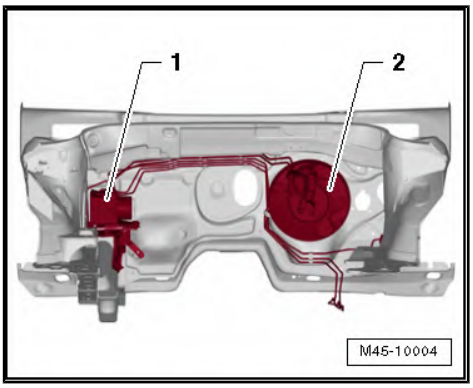
Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *The ABS control unit - J104- can be separated from the ABS hydraulic unit - N55-*
  ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*
- *Faults in the ABS do not influence the brake system and servo assistance. The conventional braking system remains fully functional even without ABS. There will be a change in braking behaviour. After the ABS warning lamp comes on, the rear wheels may lock prematurely during braking.*

ABS arrangement, left-hand drive to CW 21/2015

1 - ABS hydraulic unit - N55- with ABS control unit - J104-

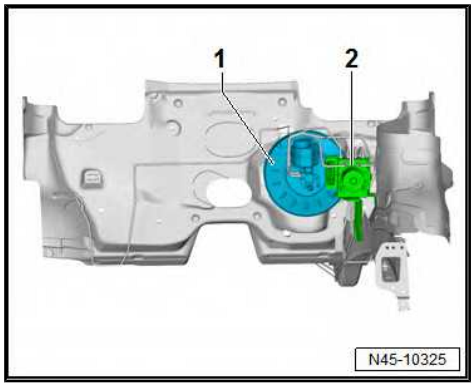
2 - Brake servo



ABS arrangement, left-hand drive to CW 22/2015

1 - Brake servo

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

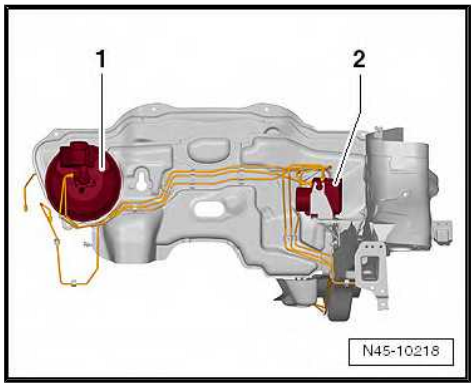


Arrangement of the ABS, right-hand drive vehicle

1 - Brake servo

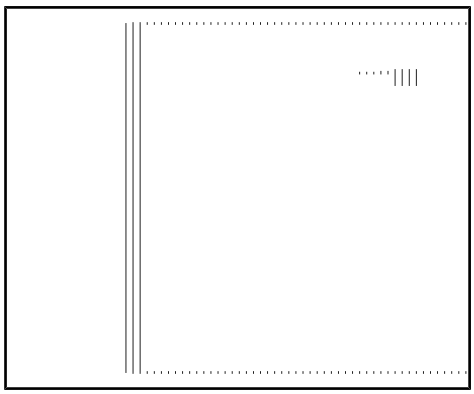
2 - ABS hydraulic unit - N55- with ABS control unit - J104-

Vehicles with ABS



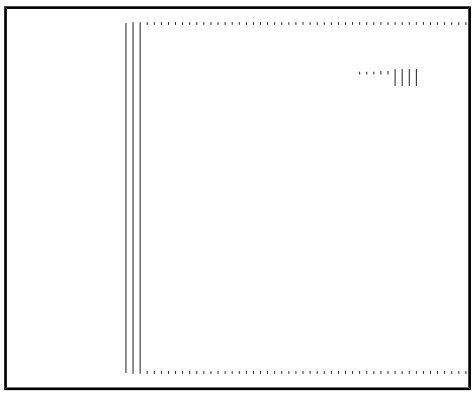
The ABS control unit - J104- -1- and the ABS hydraulic unit - N55- -2- form a single unit and cannot be separated. The hydraulic pump -3- must not be separated from the ABS hydraulic unit - N55- -2-.

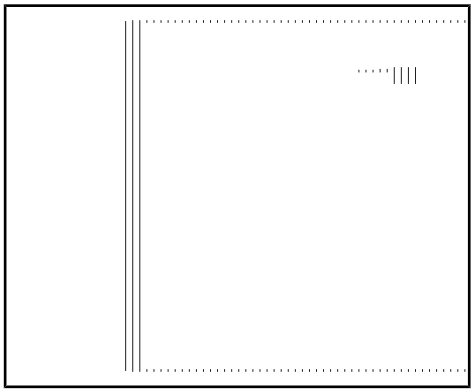
Vehicles with ABS / ESC to 04/2015



The ABS control unit - J104- -1- and the ABS hydraulic unit - N55- -2- form a single unit and cannot be separated. The hydraulic pump -3- must not be separated from the ABS hydraulic unit - N55- -2-.

Vehicles with ABS / ESC from 05/2015





The ABS control unit - J104- -1- and the ABS hydraulic unit - N55- -2- form a single unit. They can only be separated after the complete unit is removed. The ABS control unit - J104- can be separated from the ABS hydraulic unit - N55-
⇒ “3.3 Disconnecting the control unit from the hydraulic unit”, page 32 . The hydraulic pump -3- must not be separated from the ABS hydraulic unit - N55- -2-.

New control units supplied by the spare parts area are not coded. They must be coded after installation ⇒ Vehicle diagnostic tester.

Continued for all vehicles

- Before starting work on anti-lock brake systems, query the event memory to check for complaints and conduct guided fault finding ⇒ Vehicle diagnostic tester.
- Do not separate plug connections unless the ignition is switched off.
- Before working on anti-lock braking systems, switch off the ignition and disconnect the ground strap from the battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnect and connect battery .
- If the battery earth strap is disconnected and connected, carry out additional operations ⇒ Electrical System; Rep. gr. 27 ; Battery .
- Welding work using electric welding equipment may affect the ABS system.
- Do the following before commencing welding work using electrical welding tool:

– Disconnect the earth strap from the negative terminal of the battery and cover the negative terminal.

– Connect the earth connection of the electric welding tool directly to the part to be welded. There must not be any electrically insulated parts between the earth connection and the welding point.

– Electronic control units and electrical wiring must not touch the earth connection or the welding electrode.

- During painting operations, the ABS control unit - J104- may be exposed to a maximum temperature of 95 °C for only a short period, and to a maximum of 85 °C for longer periods (approx. 2 hours).
- Do not drive the vehicle if the connector is unplugged from the ABS control unit - J104- .
- Absolute cleanliness is required when working on the anti-lock brake system. It is not permitted to use any products which contain mineral oil, such as oils, greases etc.
- Thoroughly clean connection points and the surrounding area before disconnecting, but do not use any aggressive cleaning agents, such as brake cleaner, petroleum, thinner or similar.
- Place removed parts on a clean surface and cover.
- Carefully cover or close opened components if the repair is not completed immediately (use plugs from the repair kit - 1H0 698 311 A-).
- Only use lint-free cloths.
- Do not remove spare parts from their wrappings until immediately before installation.
- Use only genuine wrapped parts.

- When the system is open, do not work with compressed air and do not move the vehicle.
- The valve coils in the ABS control unit - J104- must not be calibrated.
- The valve coils in the ABS control unit - J104- cannot be replaced.
- The pressure sensor must not be modified or damaged.
- The pressure sensor cannot be replaced.
- The sensor housing must not be subjected to mechanical load.
- No measurements must be carried out at the contact points of the ABS control unit - J104- .
- No measurements must be carried out at the contact points of the ABS hydraulic unit - N55- .
- The valve domes of the ABS hydraulic unit - N55- must not be damaged or bent.
- The contacts on the ABS control unit - J104- and the ABS hydraulic unit - N55- cannot be replaced.
- Do not use contact spray.
- No contamination or foreign object may located between ABS control unit - J104- and ABS hydraulic unit - N55- .
- Ensure that no brake fluid enters connectors.
- Observe the relevant instructions when handling brake fluid.
- After completing work which involved opening the brake system, bleed the brake system with the brake filling and bleeding device , e. g. -VAS 5234- ,
⇒ “6.3 Bleeding hydraulic system following standard procedure”, page 153 .
- During the subsequent road test, ensure that at least one controlled brake application is performed (pulsing must be felt on the brake pedal).

2 Installation location overview

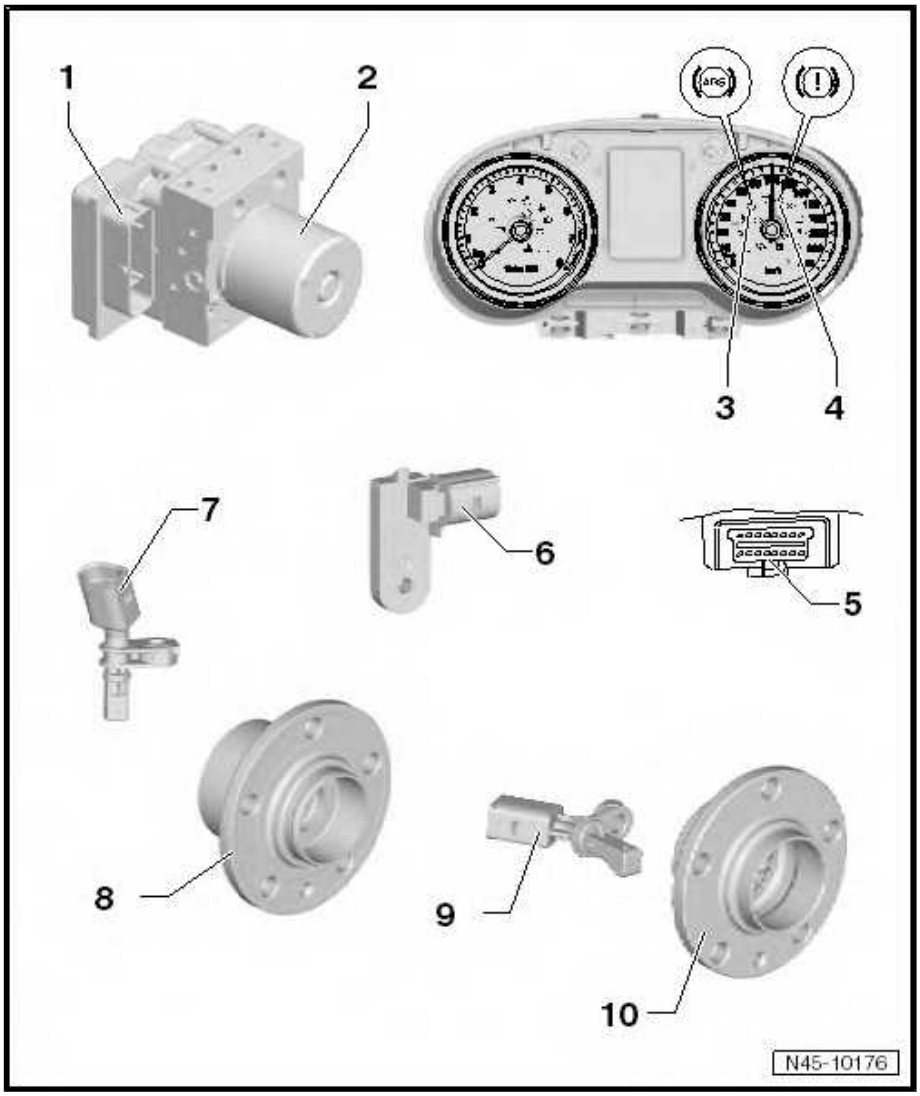
⇒ “2.1 Installation location overview - ABS”, page 11

⇒ “2.2 Installation location overview - ABS/ESC”, page 13

2.1 Installation location overview - ABS

Note

The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.



1 - ABS control unit - J104-

- ❑ Fitting location: on the ABS hydraulic unit - N55- in engine compartment ⇒ “1.1 Repair instructions for repair work on ABS”, page 7
- ❑ do not disconnect the plug connection before the self-diagnosis is complete; switch off the ignition before disconnecting the plug connection

The following components are integrated in the ABS control unit - J104- :

- ♦ Lateral acceleration sender - G200-
- ♦ Yaw rate sender - G202-
- ♦ Longitudinal acceleration sender - G251- (depending on equipment fitted)
- ♦ the components cannot be changed individually
  - ❑ Check ⇒ Vehicle diagnostic tester
  - ❑ Removing and installing the ABS control unit - J104- with the ABS hydraulic unit - N55- ⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

2 - ABS hydraulic unit - N55-

The ABS hydraulic unit - N55- consists of these components:

- ♦ ABS return flow pump - V39-
- ♦ Valve block (contains inlet and outlet valves).
  - ❑ The ABS return flow pump - V39- and the valve block must not be separated from each other
  - ❑ Removing and installing ⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

3 - ABS warning light - K47-

- ❑ Fitting location: in the dash panel insert

4 - Dual circuit and hand brake system warning light - K7 -

- ❑ Fitting location: in the dash panel insert

5 - Diagnostic connection

- ❑ Fitting location: behind bottom part of dash panel, driver side

6 - Brake light switch - F-

- ❑ Including brake pedal switch - F47-
- ❑ Removing and installing ⇒ “3.3 Removing and installing brake light switch”, page 105

7 - Front right and left wheel speed sensors - G45- / -G47-

- ❑ Check ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ “4.1 Removing and installing front speed sensors G45 / G47 ”, page 36

8 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub

9 - Rear right and left wheel speed sensors - G44- / -G46-

- ❑ Check ⇒ Vehicle diagnostic tester
- ❑ Removing and installing
  ⇒ “4.2 Removing and installing the rear speed sensors G44 / G46 ”, page 36

10 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub

2.2 Installation location overview - ABS/ESC

Note

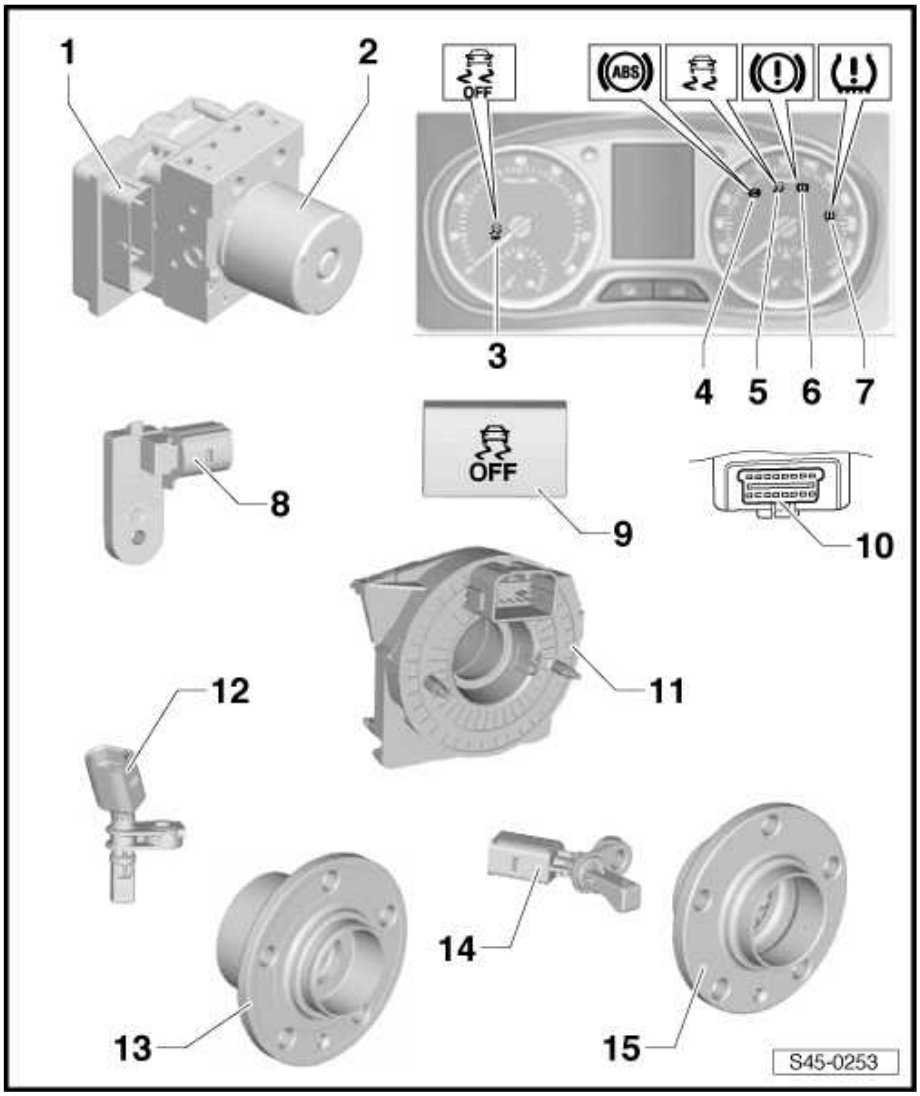
- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *On vehicles manufactured from 05/2015 (⇒ Electronic Catalogue of Original Parts), you can disconnect the ABS control unit - J104- from the ABS hydraulic unit - N55-*
  ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

1 - ABS control unit - J104-

- ❑ Fitting location: on the ABS hydraulic unit - N55- in engine compartment
- ❑ do not disconnect the plug connection before the self-diagnosis is complete; switch off the ignition before disconnecting the plug connection

The following components are integrated in the ABS control unit - J104- :

- Lateral acceleration sender - G200-
- Yaw rate sender - G202-
- Longitudinal acceleration sender - G251- (depending on equipment fitted)
- the components cannot be changed individually
  - ❑ Check ⇒ Vehicle diagnostic tester
  - ❑ Removing and installing the ABS control unit - J104- with the ABS hydraulic unit - N55-
    ⇒ "3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ", page 25



Vehicles as of 05/2015

- ❑ Disconnecting the control unit from the hydraulic unit ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32
- ❑ Fitting the control unit to the hydraulic unit
  ⇒ "3.4 Fitting the control unit to the hydraulic unit", page 34

2 - ABS hydraulic unit - N55-

The ABS hydraulic unit - N55- consists of these components:

- ❑ ABS return flow pump - V39-
- ❑ Brake pressure sender 1 - G201-

Valve block (contains inlet and outlet valves).

- ❑ The ABS return flow pump - V39- and the valve block must not be separated from each other
- ❑ Removing and installing
  ⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

3 - Warning light 2 for ESC and TCS - K216-

- ❑ Fitting location: in the dash panel insert

4 - ABS warning light - K47-

- ❑ Fitting location: in the dash panel insert

5 - Warning light for ESC and TCS - K155-

- ❑ Fitting location: in the dash panel insert

6 - Dual circuit and hand brake system warning light - K7 -

- ❑ Fitting location: in the dash panel insert

7 - Warning light for tyre pressure display - K220-

- ❑ Fitting location: in the dash panel insert

8 - Brake light switch - F-

- ❑ Including brake pedal switch - F47-
- ❑ Removing and installing ⇒ “3.3 Removing and installing brake light switch”, page 105

9 - TCS and ESP button - E256-

- ❑ Fitting location: in the dash panel

10 - Diagnostic connection

- ❑ Fitting location: behind bottom part of dash panel, driver side

11 - Steering angle sender - G85-

- ❑ Fitting location: on the steering column between the steering wheel and the steering column switch
- ❑ Removing and installing ⇒ Electrical System; Rep. gr. 94

12 - Front right and left wheel speed sensors - G45- / -G47-

- ❑ Check ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ “4.1 Removing and installing front speed sensors G45 / G47 ”, page 36

13 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub

14 - Rear right and left wheel speed sensors - G44- / -G46-

- ❑ Check ⇒ Vehicle diagnostic tester
- ❑ Removing and installing
  ⇒ “4.2 Removing and installing the rear speed sensors G44 / G46 ”, page 36

15 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub

3 Control unit and hydraulic unit

⇒ “3.1 Exploded view – control unit and hydraulic unit”, page 15

⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

⇒ “3.3 Disconnecting the control unit from the hydraulic unit”, page 32

⇒ “3.4 Fitting the control unit to the hydraulic unit”, page 34

3.1 Exploded view – control unit and hydraulic unit

⇒ “3.1.1 Summary of components - control unit and hydraulic unit for ABS, left-hand drive vehicles”, page 15

⇒ “3.1.2 Summary of components - control unit and hydraulic unit for ABS, right-hand drive vehicles”, page 17

⇒ “3.1.3 Summary of components - control unit and hydraulic unit for ABS/ESC, left-hand drive vehicles up to 21/2015”, page 19

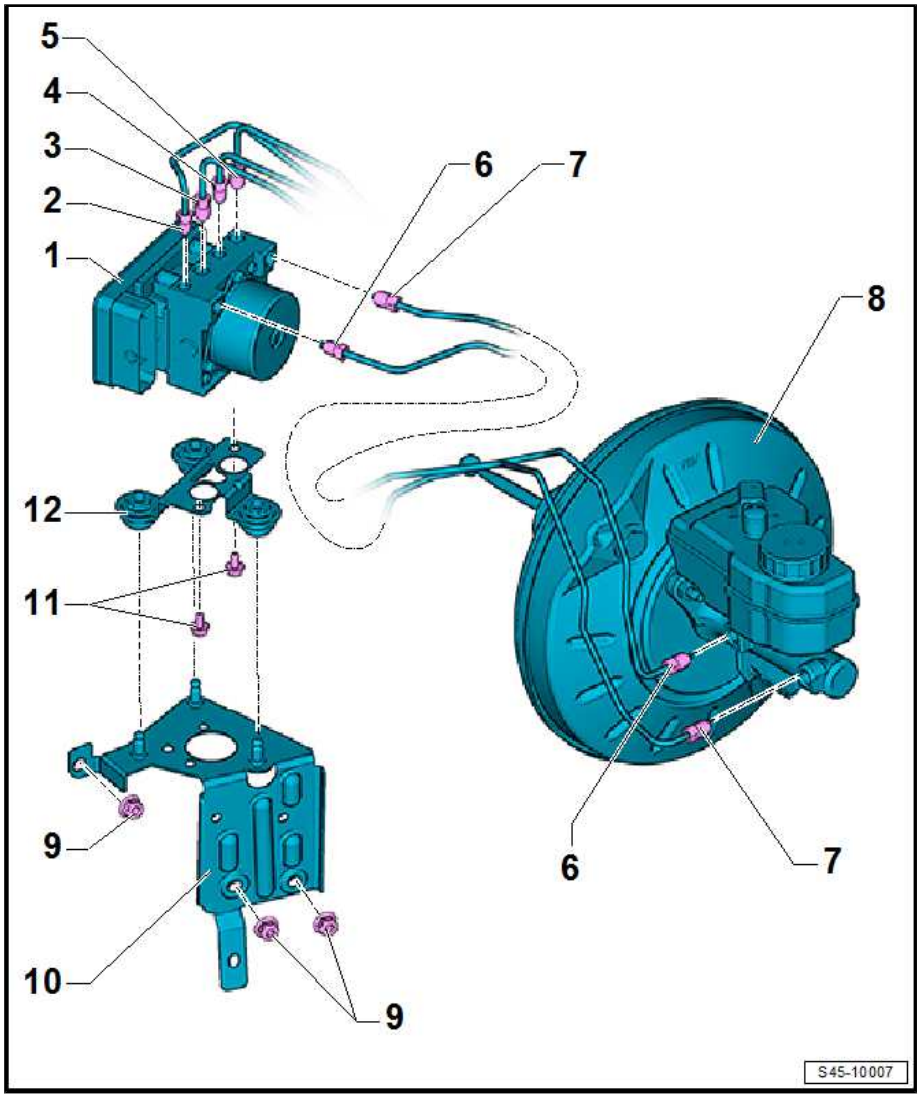
⇒ “3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015”, page 21

⇒ “3.1.5 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles”, page 23

3.1.1 Summary of components - control unit and hydraulic unit for ABS, left-hand drive vehicles

Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*



1 - ABS control unit - J104-

- ❑ with ABS hydraulic unit - N55-
- ❑ Removing and installing ⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

2 - Brake line

- ❑ to front right brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front right (VR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

3 - Brake line

- ❑ to rear left brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear left (HL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

4 - Brake line

- ❑ to rear right brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear right (HR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

5 - Brake line

- ❑ to front left brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front left (VL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

6 - Brake line

- ❑ from master brake cylinder (push rod piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 2 (HZ2)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

7 - Brake line

- ❑ from master brake cylinder (floating piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 1 (HZ1)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

8 - Brake servo

- ❑ Removing and installing ⇒ “3.6 Removing and installing brake servo”, page 114

9 - Nut

- ❑ self-locking

- ❑ 20 Nm

10 - Mounting bracket

11 - Screw

- ❑ 8 Nm

12 - Mounting bracket

- ❑ Moisten the bolt of the support with lubricant, e.g. -D 007 000 A2- , before inserting into the rubber bearings
- ❑ after installing, check for firm seating

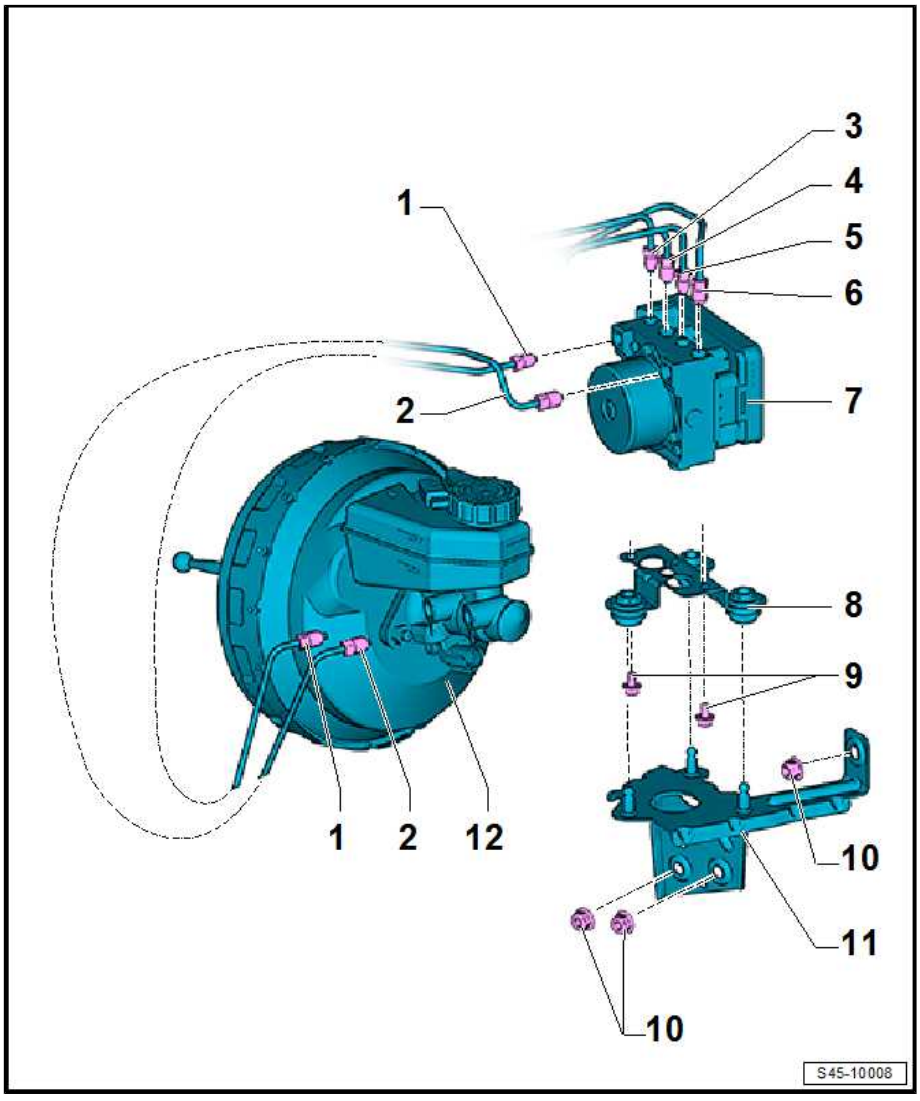
3.1.2 Summary of components - control unit and hydraulic unit for ABS, right-hand drive vehicles

Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

1 - Brake line

- ❑ from master brake cylinder (push rod piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55-



-Hydraulic cylinder 2 (HZ2)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

2 - Brake line
- ❑ from master brake cylinder (floating piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 1 (HZ1)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

3 - Brake line
- ❑ to front right brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front right (VR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

4 - Brake line
- ❑ to rear left brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear left (HL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

5 - Brake line
- ❑ to rear right brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear right (HR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

6 - Brake line
- ❑ to front left brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front left (VL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

7 - ABS control unit - J104-
- ❑ with ABS hydraulic unit - N55-
- ❑ Removing and installing
⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

8 - Mounting bracket

9 - Screw
- ❑ 8 Nm

10 - Nut
- ❑ self-locking
- ❑ 20 Nm

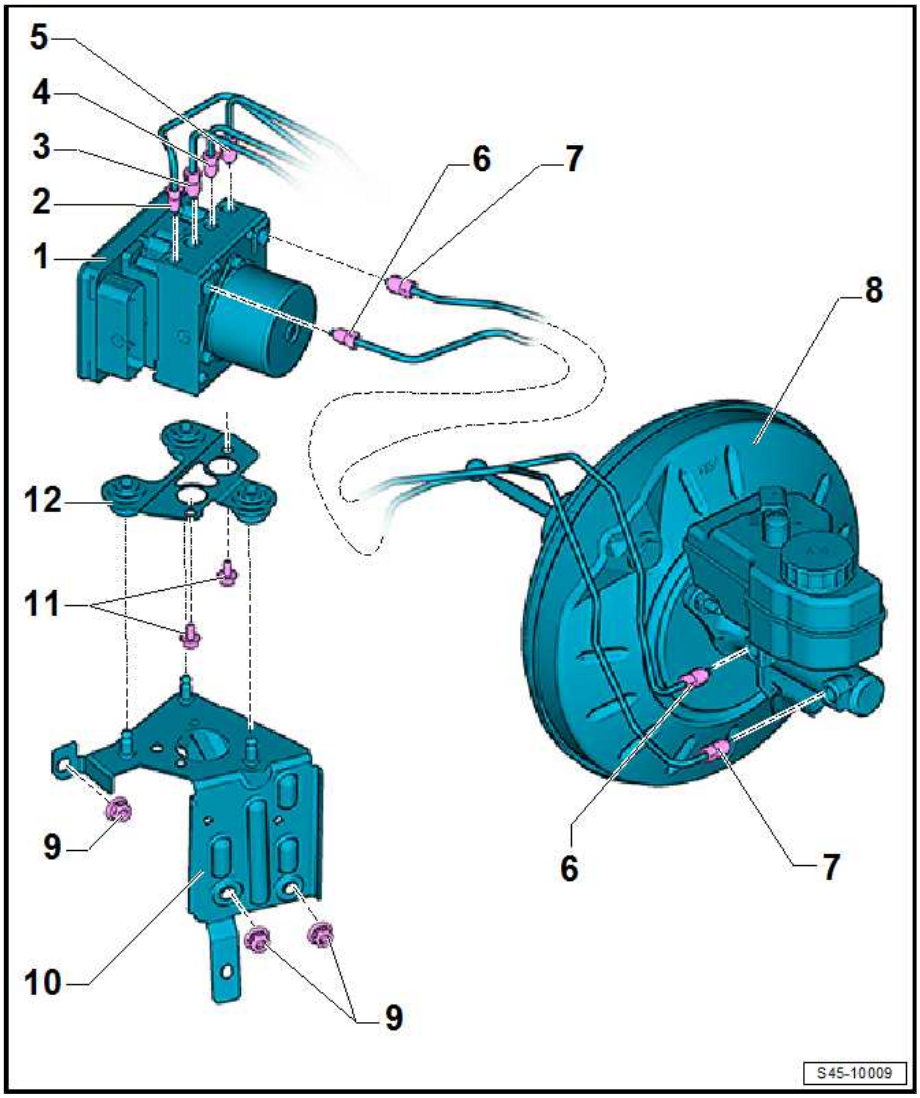
11 - Mounting bracket
- ❑ Moisten the bolt of the support with lubricant, e.g. -D 007 000 A2- , before inserting into the rubber bearings
- ❑ after installing, check for firm seating

12 - Brake servo
- ❑ Removing and installing ⇒ “3.6 Removing and installing brake servo”, page 114

3.1.3 Summary of components - control unit and hydraulic unit for ABS/ESC, left-hand drive vehicles up to 21/2015

Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *On vehicles manufactured from 05/2015 (⇒ Electronic Catalogue of Original Parts), you can disconnect the ABS control unit - J104- from the ABS hydraulic unit - N55-*
  ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*



1 - ABS control unit - J104-

- ❑ with ABS hydraulic unit - N55-
- ❑ Disconnecting the control unit from the hydraulic unit ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32
- ❑ Fitting the control unit to the hydraulic unit ⇒ "3.4 Fitting the control unit to the hydraulic unit", page 34
- ❑ Removing and installing ⇒ "3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ", page 25

2 - Brake line

- ❑ to front right brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front right (VR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

3 - Brake line

- ❑ to rear left brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear left (HL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

4 - Brake line

- ❑ to rear right brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear right (HR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

5 - Brake line

- ❑ to front left brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front left (VL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

6 - Brake line

- ❑ from master brake cylinder (push rod piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 2 (HZ2)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

7 - Brake line

- ❑ from master brake cylinder (floating piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 1 (HZ1)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

8 - Brake servo

- ❑ Removing and installing ⇒ “3.6 Removing and installing brake servo”, page 114

9 - Nut

- ❑ self-locking
- ❑ 20 Nm

10 - Mounting bracket

11 - Screw

- ❑ 8 Nm

12 - Mounting bracket

- ❑ Moisten the bolt of the support with lubricant, e.g. -D 007 000 A2- , before inserting into the rubber bearings
- ❑ after installing, check for firm seating

3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015

Note

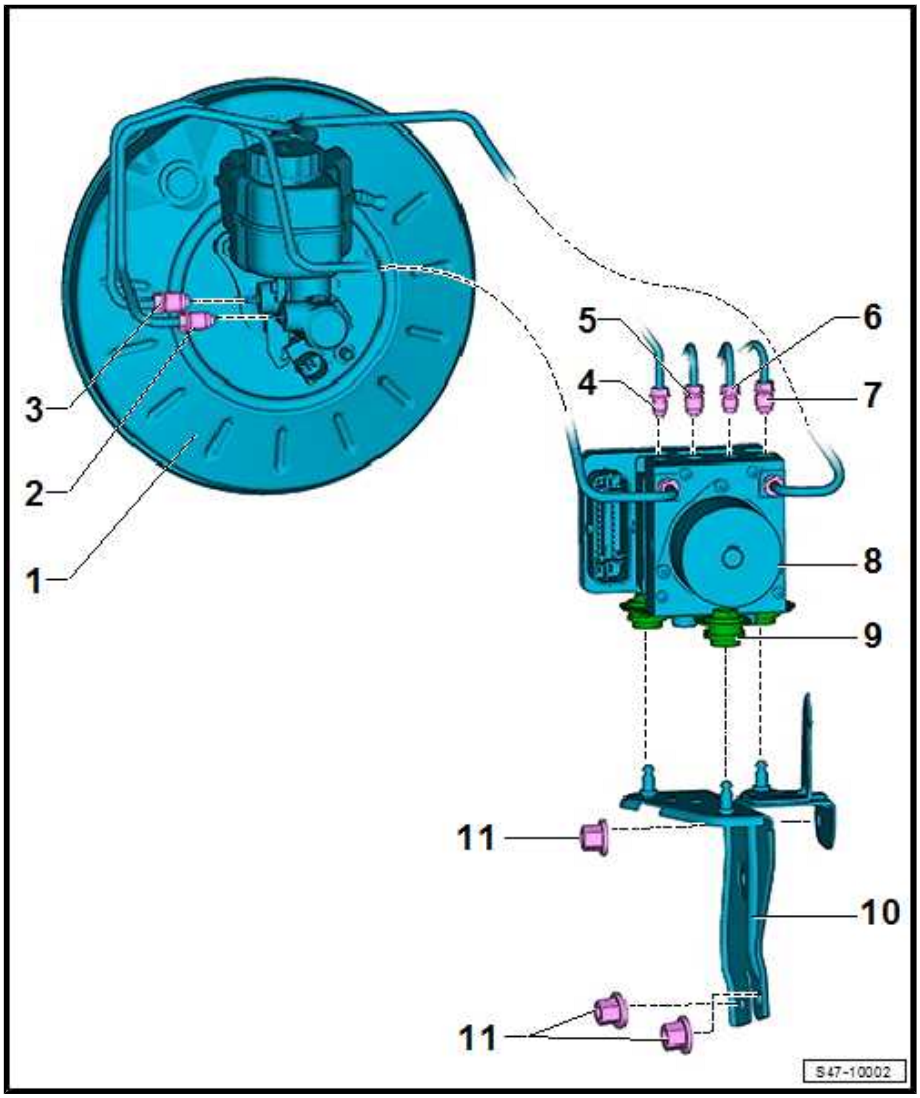
- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *On vehicles manufactured from 05/2015 (⇒ Electronic Catalogue of Original Parts), you can disconnect the ABS control unit - J104- from the ABS hydraulic unit - N55-*
  ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

1 - Brake servo

- ❑ Removing and installing ⇒ "3.6 Removing and installing brake servo", page 114

2 - Brake line

- ❑ from master brake cylinder (push rod piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55-



-Hydraulic cylinder 2 (HZ2)-

- ❑ With thread M12 x 1
- ❑ 14 Nm

3 - Brake line

- ❑ from master brake cylinder (floating piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 1 (HZ1)-
- ❑ With thread M12 x 1

- ❑ 14 Nm

4 - Brake line

- ❑ to front right brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front right (VR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

5 - Brake line

- ❑ to rear left brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear left (HL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

6 - Brake line

- ❑ to rear right brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear right (HR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

7 - Brake line

- ❑ to front left brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front left (VL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

8 - ABS control unit - J104-

- ❑ with ABS hydraulic unit - N55-
- ❑ Disconnecting the control unit from the hydraulic unit
  ⇒ “3.3 Disconnecting the control unit from the hydraulic unit”, page 32
- ❑ Fitting the control unit to the hydraulic unit
  ⇒ “3.4 Fitting the control unit to the hydraulic unit”, page 34
- ❑ Removing and installing
  ⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

9 - Mounting bracket

- ❑ with rubber bearings
- ❑ attached to the ABS hydraulic unit - N55- by 2 bolts
- ❑ 8 Nm

10 - Mounting bracket

- ❑ Moisten the bolt of the support with lubricant, e.g. -D 007 000 A2- , before inserting into the rubber bearings
- ❑ after installing, check for firm seating

11 - Nut

- ❑ self-locking
- ❑ 20 Nm

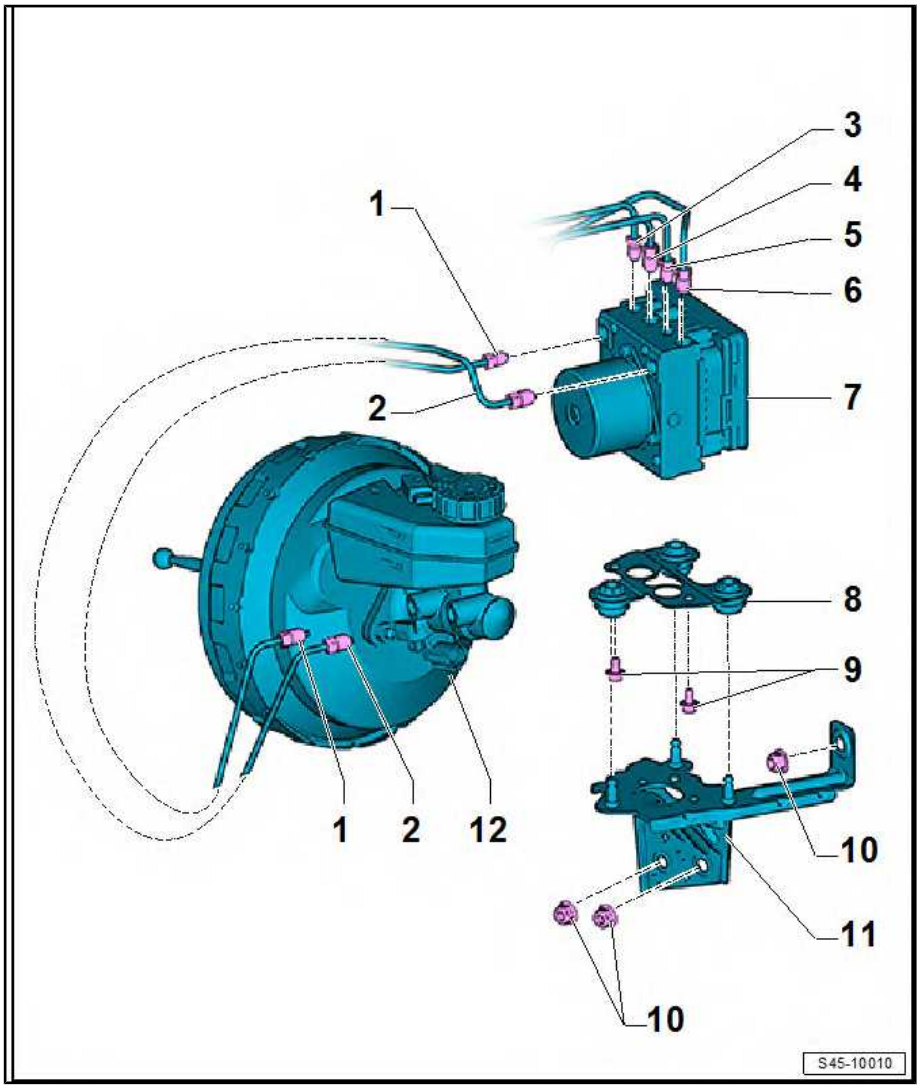
3.1.5 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles

Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *On vehicles manufactured from 05/2015 (⇒ Electronic Catalogue of Original Parts), you can disconnect the ABS control unit - J104- from the ABS hydraulic unit - N55-*
  ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

1 - Brake line

- ❑ from master brake cylinder (push rod piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55-



-Hydraulic cylinder 2 (HZ2)-

- ❑ With thread M12 x 1
- ❑ 14 Nm

2 - Brake line

- ❑ from master brake cylinder (floating piston circuit) to ABS hydraulic unit - N55-
- ❑ Marking on the ABS hydraulic unit - N55- -Hydraulic cylinder 1 (HZ1)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

3 - Brake line

- ❑ to front right brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front right (VR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

4 - Brake line

- ❑ to rear left brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear left (HL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

5 - Brake line

- ❑ to rear right brake caliper/wheel-brake cylinder
- ❑ Marking on the ABS hydraulic unit - N55- -Rear right (HR)-
- ❑ With thread M10 x 1
- ❑ 14 Nm

6 - Brake line

- ❑ to front left brake caliper
- ❑ Marking on the ABS hydraulic unit - N55- -Front left (VL)-
- ❑ With thread M12 x 1
- ❑ 14 Nm

7 - ABS control unit - J104-

- ❑ with ABS hydraulic unit - N55-
- ❑ Disconnecting the control unit from the hydraulic unit
  ⇒ “3.3 Disconnecting the control unit from the hydraulic unit”, page 32
- ❑ Fitting the control unit to the hydraulic unit
  ⇒ “3.4 Fitting the control unit to the hydraulic unit”, page 34
- ❑ Removing and installing
  ⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25

8 - Mounting bracket

9 - Screw

- ❑ 8 Nm

10 - Nut

- ❑ self-locking
- ❑ 20 Nm

11 - Mounting bracket

- ❑ Moisten the bolt of the support with lubricant, e.g. -D 007 000 A2- , before inserting into the rubber bearings
- ❑ after installing, check for firm seating

12 - Brake servo

- ❑ Removing and installing ⇒ “3.6 Removing and installing brake servo”, page 114

3.2 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55-

⇒ “3.2.1 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , left -hand drive vehicles up to 21/2015”, page 25

⇒ “3.2.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , left -hand drive vehicles from 22/2015”, page 28

⇒ “3.2.3 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , right-hand drive vehicles”, page 30

3.2.1 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- , left -hand drive vehicles up to 21/2015

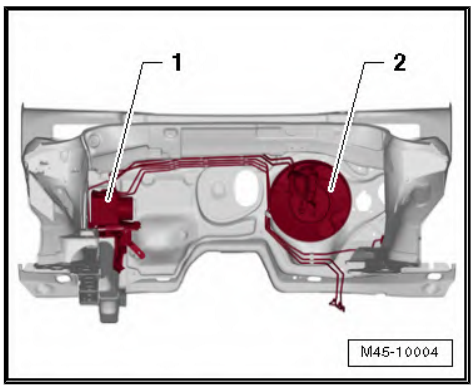
Special tools and workshop equipment required

- Brake pedal load , e.g. -V.A.G 1869/2-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Repair kit - 1H0 698 311 A-

Removing

Fitting location:

The ABS control unit - J104- is bolted to the ABS hydraulic unit - N55- and is located in the engine compartment on the right side.



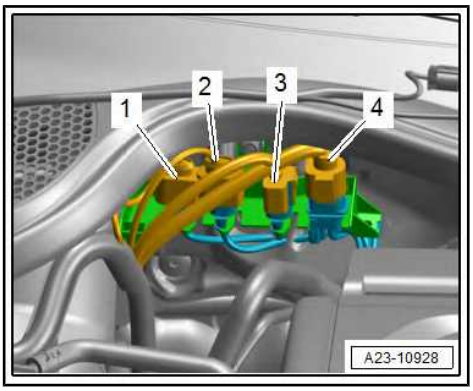
Note

Do not bend the brake lines in the area of the hydraulic unit.

– Read out and note the actual control unit coding ⇒ Vehicle diagnostic tester.
– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .
– If present, remove engine cover ⇒ Engine; Rep. gr. 10 .

Vehicles with engines TDI Common Rail DPF (diesel particle filter)

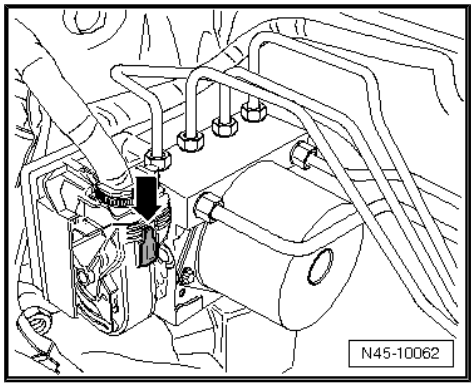
– Remove plenum chamber cover ⇒ Body Work; Rep. gr. 66 .



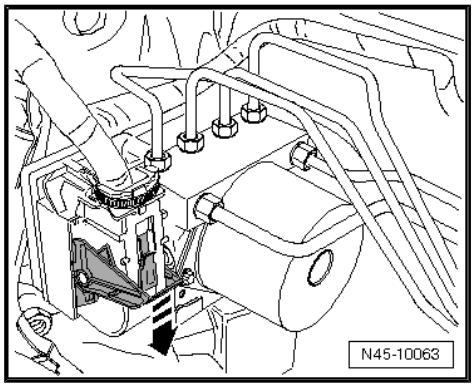
– If present, open heat shield collar.
– Take plug connections -1- to -4- out of the bracket, disconnect and expose electric cables.
– Remove the connector holder from the bulkhead plenum chamber.
– Remove intake hose and air filter ⇒ Engine; Rep. gr. 23 .
– Pull the engine control unit out of the bracket and lay to the side.
– Remove engine control unit bracket.
– Remove the insulation from the bulkhead plenum chamber.
– Remove bulkhead plenum chamber ⇒ Body Work; Rep. gr. 50 .

Continued for all vehicles

– Press down the red fuse -arrow-.



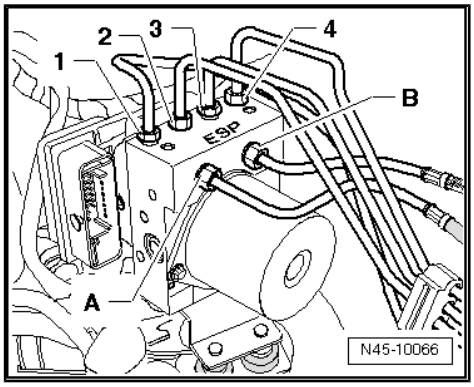
– Unlock the plug connection of the control unit -arrow- and pull out towards the front.
– Attach the bleeder hose of the bleeding bottle onto the vent valves of the front left and rear left brake caliper and open vent valves.
– Press down brake pedal with brake pedal load , e.g. -V.A.G 1869/2- , at least 60 mm.
– Close front left and rear left bleeder valves.
– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .
– Place a sufficient non-fluffing cloths under and around the ABS control unit - J104- and the ABS hydraulic unit - N55- .



NOTICE

Make sure that no brake fluid gets onto the contacts of the ABS control unit - J104- .

– Mark brake lines -A- and -B- from the ABS hydraulic unit - N55- to the master brake cylinder.
– Unscrew the brake lines from the ABS hydraulic unit - N55- , unclip from the brackets and lay to the side.
– Close the brake lines and threaded holes immediately with plugs from the repair kit - 1H0 698 311 A- .
– Mark the brake lines (for brake calliper) -1- to -4-, unscrew and close with plugs from the repair kit - 1H0 698 311 A- .
– Pull ABS hydraulic unit - N55- with ABS control unit - J104- upwards out of the bracket.
– Slacken nuts and remove bracket (if it is necessary to remove the bracket).



Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *The ABS control unit - J104- can be separated from the ABS hydraulic unit - N55-*
  ⇒ "3.3 Disconnecting the control unit from the hydraulic unit", page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

Installing

Installation is performed in the reverse order; pay attention to the following points:

Note

- *Only remove plugs from the new ABS hydraulic unit - N55- if the relevant brake line is installed.*
- *If the plugs were already removed from the ABS hydraulic unit - N55- , then brake fluid may escape and adequate filling and bleeding of the unit can no longer be guaranteed.*
- *Make sure that the rubber bearings are not pressed out of the console when installing the bracket. After installing, check for tight fight, otherwise failure may be caused by a malfunction of the ABS hydraulic unit - N55- .*

• Make sure that the multi-pin plug connection latches correctly with the ABS control unit - J104- .
– Remove brake pedal load , e.g. -V.A.G 1869/2- .
– Bleed brake system.
– Connect the battery and carry out any additional measures after reconnecting the battery ⇒ Electrical System; Rep. gr. 27 .
– Code new ABS control unit - J104- ⇒ Vehicle diagnostic tester and adapt.

While doing so, a basic setting of the steering angle sender - G85- , the lateral acceleration sender - G200- , the brake pressure sender 1 - G201- and the longitudinal acceleration sender - G251- must be performed ⇒ Vehicle diagnostic tester.

Tightening torques

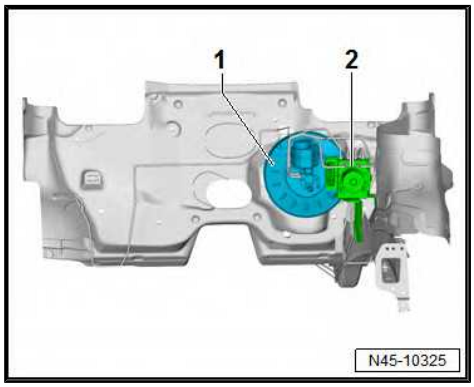
- ⇒ “3.1.3 Summary of components - control unit and hydraulic unit for ABS/ESC, left-hand drive vehicles up to 21/2015”, page 19
- Bulkhead plenum chamber ⇒ Body Work; Rep. gr. 50 .
- Air filter ⇒ Engine; Rep. gr. 23

3.2.2 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- , left -hand drive vehicles from 22/2015

Special tools and workshop equipment required

- Brake pedal load , e.g. -V.A.G 1869/2-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Repair kit - 1H0 698 311 A-

The ABS control unit - J104- is bolted to the ABS hydraulic unit - N55- and is located in the engine compartment -2-.



Note

Do not bend the brake lines in the area of the hydraulic unit.

Removing

– Read out and document the current control unit coding ⇒ Vehicle diagnostic tester.

– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .

For vehicles with 1.6 MPI engine with automatic gearbox

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

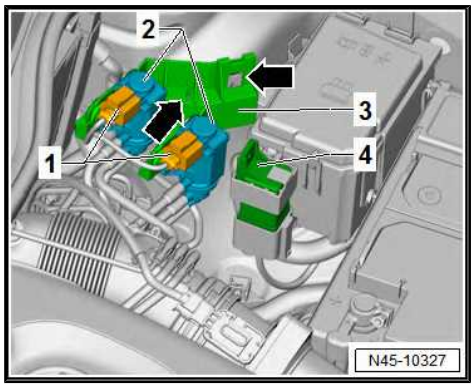
– Undo the mounting bracket with the automatic gearbox control unit - J217- and place the ⇒ gearbox; Rep. gr. 37 down to the side.

For vehicles with a 1.4 TDI engine

– Mark and pull off connector -1- of the boost pressure actuator - V465- and the change over valve for the intake manifold valve - N239- -2-.

– Remove bracket -3- together with the boost pressure actuator - V465- and the change over valve for the intake manifold valve - N239- , place down to the side.

– Remove bracket with -automatic glow period control unit- J179 -4- from the E-box and place to the side.

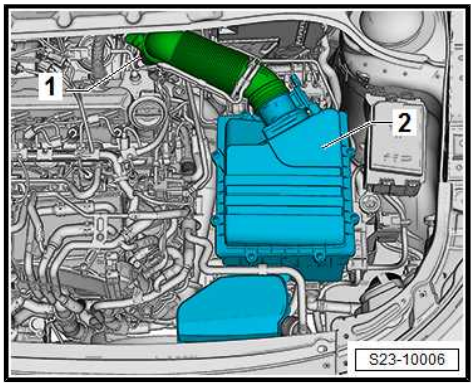


For vehicles with a 1.6 TDI engine

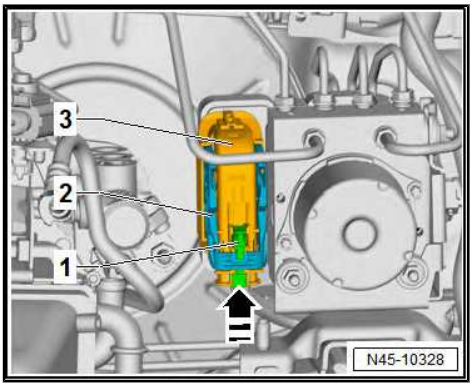
– Remove engine cover ⇒ Engine; Rep. gr. 10 .

– Loosen hose clamp -1- and remove the complete air filter housing -2- ⇒ Engine; Rep. gr. 23 .

Continued for all vehicles



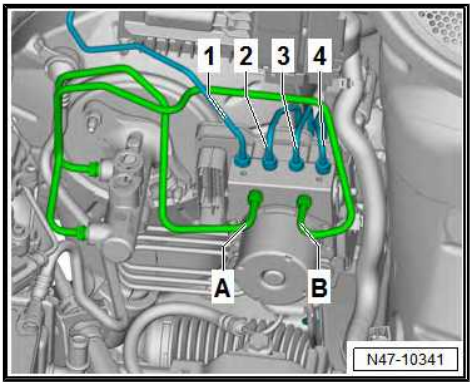
– Press fuse -1- upwards in -direction of arrow-.
– Press locking element -2- upwards in -direction of arrow- and unlock connector -3-.
– Disconnect connector -3- from ABS control unit - J104- and place to side.
– Place a sufficient non-fluffing cloths under and around the ABS control unit - J104- and the ABS hydraulic unit - N55- .



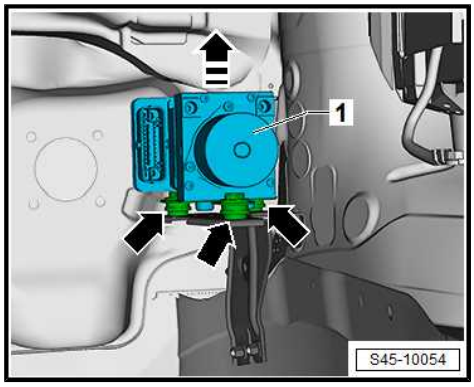
NOTICE

Make sure that no brake fluid gets onto the contacts of the ABS control unit - J104- .

– Drain the brake fluid from the brake fluid reservoir using the brake filling and bleeding device e.g. -VAS 5234- .
– Mark brake lines -A- and -B- from the ABS hydraulic unit - N55- to the master brake cylinder.
– Screw off brake lines -A- and -B- from the ABS hydraulic unit - N55- and brake cylinder.
– Close the openings on the ABS hydraulic unit - N55- and the master brake cylinder with screw plugs from the repair kit - H0 698 311 A- .
– Unscrew brake lines (to the brake calipers) -1-4- from the ABS hydraulic unit - N55- .
– Close the brake lines with the screw plugs from the repair kit - H0 698 311 A- .



– Pull ABS hydraulic unit - N55- with ABS control unit - J104- upwards out of the bracket.



Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *The ABS control unit - J104- can be separated from the ABS hydraulic unit - N55-*
  ⇒ “3.3 Disconnecting the control unit from the hydraulic unit”, page 32 .
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

Installing

Installation is performed in the reverse order; pay attention to the following points:

Note

- *Only remove plugs from the new ABS hydraulic unit - N55- if the relevant brake line is installed.*
- *If the plugs were already removed from the ABS hydraulic unit - N55- , then brake fluid may escape and adequate filling and bleeding of the unit can no longer be guaranteed.*
- *Make sure that the rubber bearings are not pressed out of the console when installing the bracket. After installing, check for tight fight, otherwise failure may be caused by a malfunction of the ABS hydraulic unit - N55- .*

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Connect the battery and carry out any additional measures after reconnecting the battery ⇒ Electrical System; Rep. gr. 27 .

– Code the control unit - J104- ⇒ Vehicle diagnostic tester.

While doing so, a basic setting of the steering angle sender - G85- , the lateral acceleration sender - G200- , the brake pressure sender 1 - G201- and the longitudinal acceleration sender - G251- must be performed ⇒ Vehicle diagnostic tester.

Tightening torques

- ⇒ “3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015”, page 21

3.2.3 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- , right-hand drive vehicles

Removing

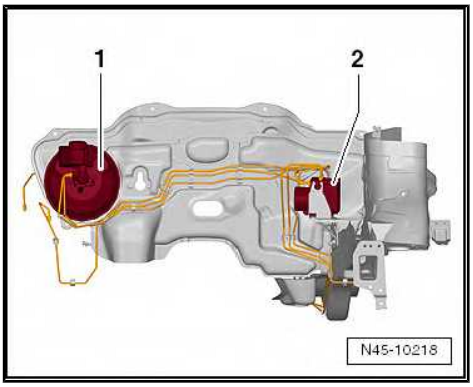
Special tools and workshop equipment required

- Brake pedal load , e.g. -V.A.G 1869/2-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Repair kit - 1H0 698 311 A-

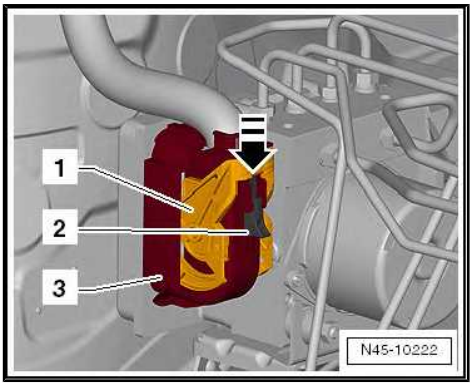
Fitting location:

The ABS control unit - J104- is bolted to the ABS hydraulic unit - N55- and is located in the engine compartment on the left side.

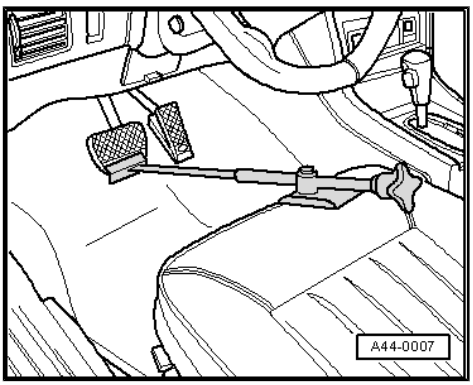
– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .
– Remove engine cover ⇒ Engine; Rep. gr. 10 .
– Remove air filter ⇒ Engine; Rep. gr. 24 (fuel engines) or ⇒ Engine; Rep. gr. 23 (diesel engines).



– Press fuse -2- in -direction of arrow-.
– Unlock fuse -1- for plug -3-.
– Disconnect connector -3-.



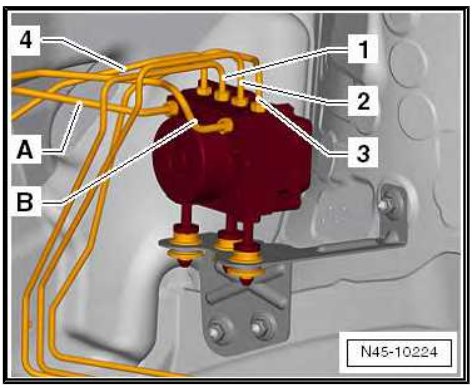
– Position brake pedal load , e.g. -V.A.G 1869/2- .
– Attach the bleeder hose of the bleeding bottle onto the vent valves of the front left and rear left brake caliper and open vent valves.
– Press down brake pedal with brake pedal load , e.g. -V.A.G 1869/2- , at least 60 mm.
– Close front left and rear left bleeder valves.
– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .
– Place a sufficient non-fluffing cloths under and around the ABS control unit - J104- and the ABS hydraulic unit - N55- .



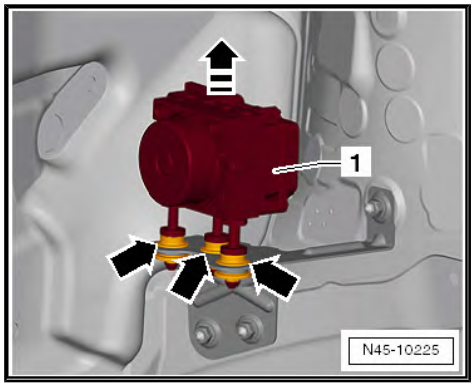
NOTICE

Make sure that no brake fluid gets onto the contacts of the ABS control unit - J104- .

– Mark brake lines -A- and -B- from the master brake cylinder and unscrew from the ABS hydraulic unit - N55- .
– Close the brake lines and threaded holes immediately with plugs from the repair kit - 1H0 698 311 A- .
– Mark the remaining brake lines -1- to -4- and unscrew from the ABS hydraulic unit - N55- .
– Close the brake lines and threaded holes immediately with plugs from the repair kit - 1H0 698 311 A- .



– Pull ABS hydraulic unit - N55- with ABS control unit - J104- upwards out of the bracket.
– Slacken nuts and remove bracket (if it is necessary to remove the bracket).



Note

- *If the ABS hydraulic unit - N55- is damaged, the ABS control unit - J104- must be fully replaced with the ABS hydraulic unit - N55- .*
- *The ABS control unit - J104- can be separated from the ABS hydraulic unit - N55-* *⇒ “3.3 Disconnecting the control unit from the hydraulic unit”, page 32 .*
- *The hydraulic pump and the ABS hydraulic unit - N55- must not be separated from each other.*

Installing

Installation is performed in the reverse order; pay attention to the following points:

Note

- *Only remove plugs from the new ABS hydraulic unit - N55- if the relevant brake line is installed.*
- *If the plugs were already removed from the ABS hydraulic unit - N55- , then brake fluid may escape and adequate filling and bleeding of the unit can no longer be guaranteed.*
- *Make sure that the rubber bearings are not pressed out of the console when installing the bracket. After installing, check for tight fight, otherwise failure may be caused by a malfunction of the ABS hydraulic unit - N55- .*

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .
– Connect the battery and carry out any additional measures after reconnecting the battery ⇒ Electrical System; Rep. gr. 27 .
– Code the control unit - J104- ⇒ Vehicle diagnostic tester.

While doing so, a basic setting of the steering angle sender - G85- , the lateral acceleration sender - G200- , the brake pressure sender 1 - G201- and the longitudinal acceleration sender - G251- must be performed ⇒ Vehicle diagnostic tester.

Tightening torques

- ⇒ “3.1.5 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles”, page 23

3.3 Disconnecting the control unit from the hydraulic unit

- In the case of a malfunction of the ABS control unit - J104- , the control unit must be disconnected from the ABS hydraulic unit - N55- and replaced individually.
- In the case of a malfunction of the ABS hydraulic unit - N55- , the ABS hydraulic unit - N55- must be completely replaced together with the ABS control unit - J104- .

NOTICE

- **The hydraulic pump - V64- and ABS hydraulic unit - N55- must not be separated from each other.**
- **On a disconnected ABS control unit - J104- , the printed circuit board is exposed.**
- **No moisture and no dirt particles must penetrate into the interior of the ABS control unit - J104- .**
- **Before handling the ABS control unit - J104- , the technician must discharge himself electrostatically. The electrostatic discharge is achieved by touching earthed metal parts. Do not grab directly at the plug contacts or electronic components.**

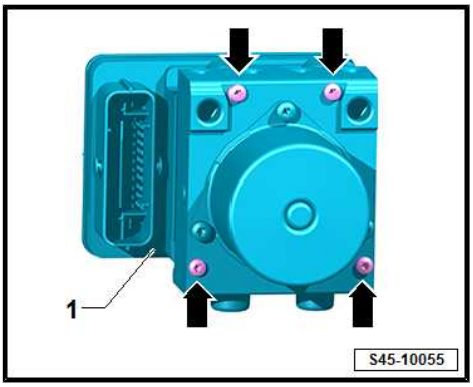
Note

Electrostatic charge can cause malfunctions of the ABS control unit - J104- .

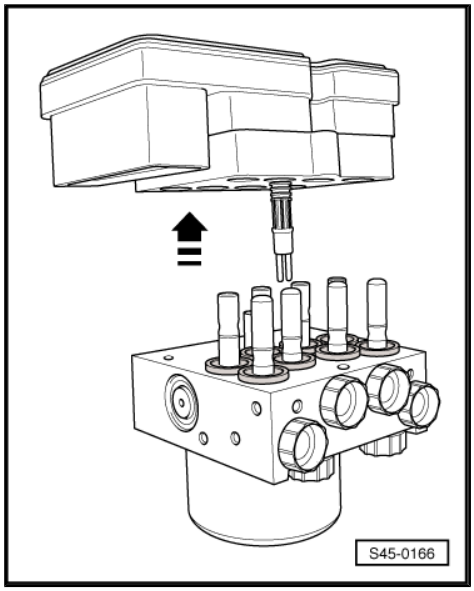
– Remove the ABS hydraulic unit - N55- with the ABS control unit - J104-
⇒ “3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ”, page 25 .

– Lay the ABS hydraulic unit - N55- with the ABS control unit - J104- on a clean flat surface facing upwards.

– Unscrew the fixing screws -arrows- of the ABS control unit - J104- -1- and place aside immediately (danger of mix-ups with new screws).



– Separate the ABS control unit - J104- from the ABS hydraulic unit - N55- in the -direction of arrow-.



Note

The ABS control unit - J104- may not tilt when it is pulled off from the ABS hydraulic unit - N55- .

– Cover the solenoid coils of the ABS control unit - J104- with a non-fluffing cloth.

After separating from the ABS control unit - J104- and the ABS hydraulic unit - N55- , use the transport protection for valve domes.

– Check the sealing surface of the ABS hydraulic unit - N55- for cleanliness. If necessary clean with white spirits and a non-fluffing cloth.

Note

- *The sealing surface of the ABS control unit - J104- may not be repaired using a file, metal scraper or similar.*
- *If the sealing surface is damaged, replace the sealing surface of the ABS control unit - J104- .*
- *The seal of the ABS control unit - J104- must not be damaged.*
- *The seal is not designed as spare part, so it is part of the new ABS control unit - J104- .*

3.4 Fitting the control unit to the hydraulic unit

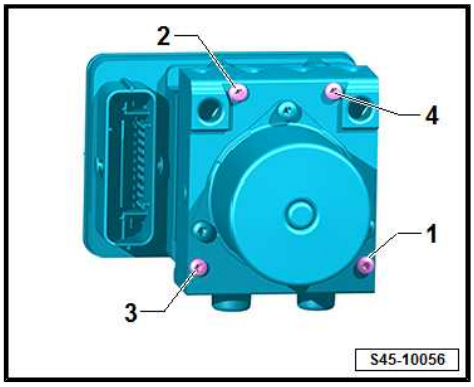
NOTICE

Strong vibrations (e.g. fall, knock) can destroy the ABS control unit - J104- . The ABS control unit - J104- must no longer be used.

- The contact surfaces must be cleaned before assembling.
- The seal of the ABS control unit - J104- must not be damaged.

– Position the ABS control unit - J104- without tilting it onto the ABS hydraulic unit - N55- .

– Tighten the screws in the order -1-, -2-, -3-, -4- in three stages ⇒ page 35 .



Note

- *The threads in the ABS hydraulic unit - N55- must not be repaired or recut.*
- *If the thread is damaged, the ABS hydraulic unit - N55- must be replaced.*

Note

A new control unit may only be installed on the same hydraulic unit twice as a maximum to ensure that the elastic seal is still leak-tight.

Tightening torques

Component	Tightening torque
ABS hydraulic unit - J104- to ABS control unit - N55- - 1st stage	1.5
ABS hydraulic unit - J104- to ABS control unit - N55- - 2nd stage	2.5 Nm
ABS control unit - J104- to ABS hydraulic unit - N55- - 3rd stage	3.5 Nm

4 Sensors

⇒ “4.1 Removing and installing front speed sensors G45 / G47 ”, page 36

⇒ “4.2 Removing and installing the rear speed sensors G44 / G46 ”, page 36

4.1 Removing and installing front speed sensors -G45- / -G47-

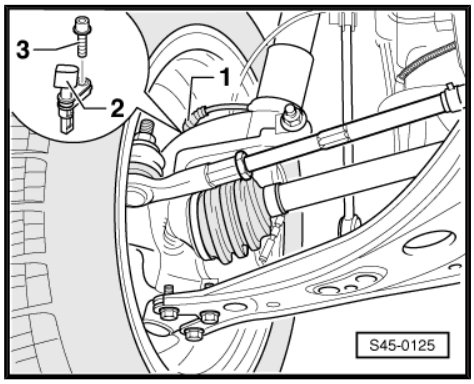
Removing

– Raise vehicle.

– Disconnect connector -1- on the front wheel speed sensor .

– Release screw -3-.

– Pull front speed sensor -2- out of the wheel bearing housing.



Installing

– Installation is performed in the reverse order; pay attention to the following points:

– Before inserting the front speed sensor , clean the inner surface of the hole and moisten with hot bolt paste - G 052 112 A3- .

Tightening torques

◆ ⇒ “1.1 Assembly overview - front brakes”, page 38

4.2 Removing and installing the rear speed sensors -G44- / -G46-

Note

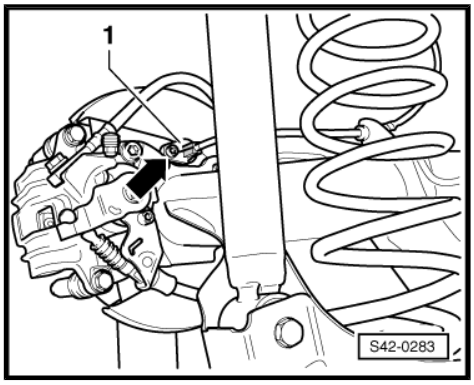
The procedure for removal and installation of the speed sensor is identical for vehicles with drum brakes and for vehicles with disc brakes.

Removing

– Raise vehicle.

– Disconnect connector -1- on the rear speed sensor .

– Unscrew screw -arrow-.



Note

The wheel speed sensor is shown on the vehicle with disc brakes.

– Pull the rear speed sensor -1- out of the opening in the axle stud and unclip its cables on the axle.

Installing

– Installation is carried out in the reverse order.

Tightening torques

- ⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52
- ⇒ “2.1.3 Summary of components - rear axle brake, disc brake”, page 56

46 – Brakes - mechanism

1 Front brakes

⇒ “1.1 Assembly overview - front brakes”, page 38

⇒ “1.2 Removing and installing brake pads”, page 41

⇒ “1.3 Removing and installing brake caliper”, page 46

1.1 Assembly overview - front brakes

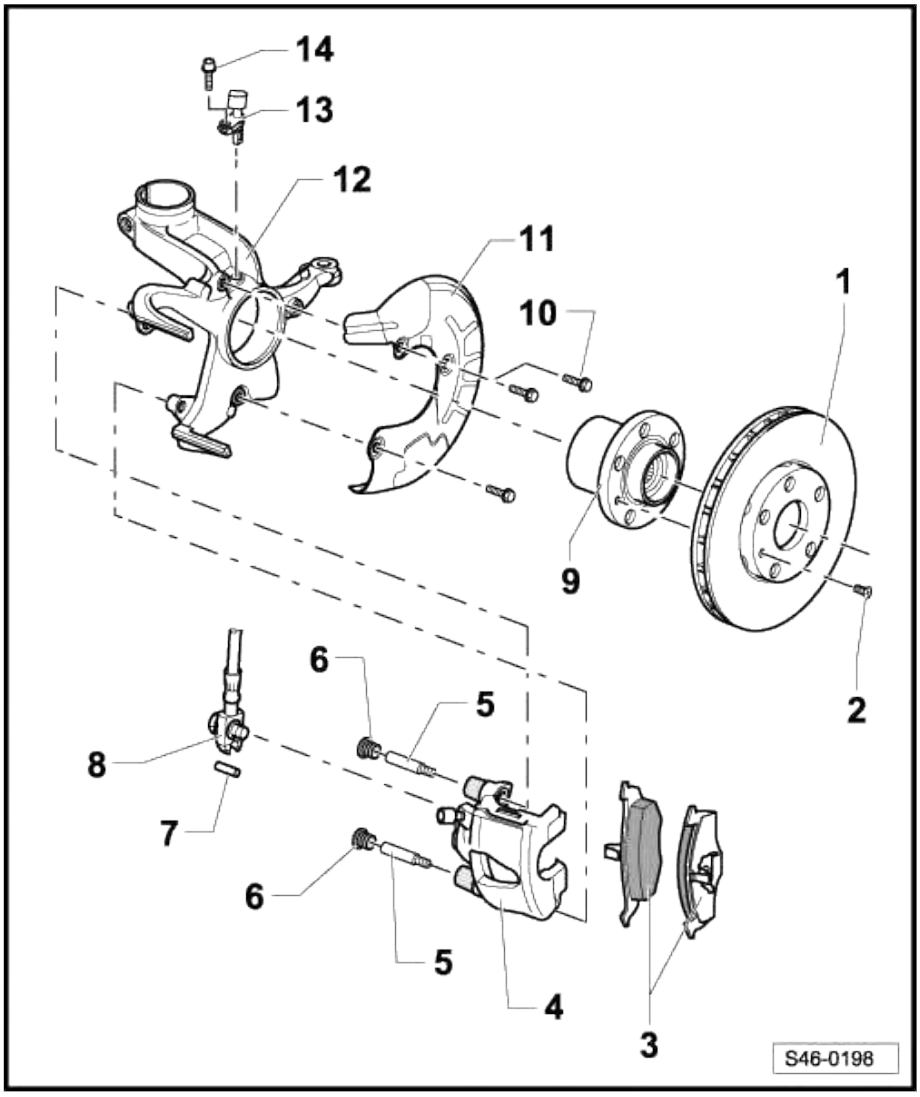
⇒ “1.1.1 Summary of components - front brake FS-III”, page 38

⇒ “1.1.2 Summary of components - front brake FN3”, page 40

1.1.1 Summary of components - front brake FS-III

Note

- *Observe the instructions for changing the pad ⇒ “1.2.1 Changing the brake pads of the front brake - Mounting instructions”, page 41*
- *Brake inspection ⇒ “4 Brake inspection”, page 6 .*
- *After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.*
- *Use the brake filling and bleeding device , e.g. -VAS 5234- , to drain the brake fluid from the brake fluid reservoir.*
- *Use the brake pedal load , e.g. -V.A.G 1869/2- , before removing a brake calliper or separating a brake hose from the brake calliper.*



1 - Brake disc

- ❑ internally ventilated
- ❑ Dimensions and wear limit ⇒ “3.1.2 Front brakes”, page 3
- ❑ always replace axle-wise
- ❑ unscrew the brake caliper before removing
- ❑ Do not use force to separate the brake discs from the wheel hub, if necessary use rust solvent; as you could otherwise damage the brake discs.
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

2 - Screw

- ❑ 8 Nm

3 - Brake pads

- ❑ Dimensions and wear limit ⇒ “3.1.2 Front brakes”, page 3
- ❑ Inspect thickness ⇒ Maintenance ; Booklet Rapid NH
- ❑ Observe the instructions for changing the pad ⇒ “1.2.1 Changing the brake pads of the front brake - Mounting instructions”, page 41
- ❑ always replace axle-wise
- ❑ Removing and installing ⇒ “1.2.2 Removing and installing brake pads, floating caliper disc brake FS-III”, page 42

4 - Brake caliper

- ❑ Removing and installing ⇒ “1.3.1 Removing and installing brake caliper FS-III”, page 46
- ❑ Summary of components ⇒ “1.1.1 Exploded view – front brake caliper - brake FS III”, page 90
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

5 - Guide bolt

- ❑ 30 Nm

6 - Cap

- ❑ Disconnect

7 - Tensioning sleeve

8 - Brake hose

- ❑ with banjo union and hollow screw
- ❑ 35 Nm

9 - Wheel hub with wheel bearing

- ❑ for vehicles with ABS the sensor ring is built into the wheel hub

10 - Screw

- ❑ 12 Nm

11 - Cover plate

12 - Wheel bearing housing

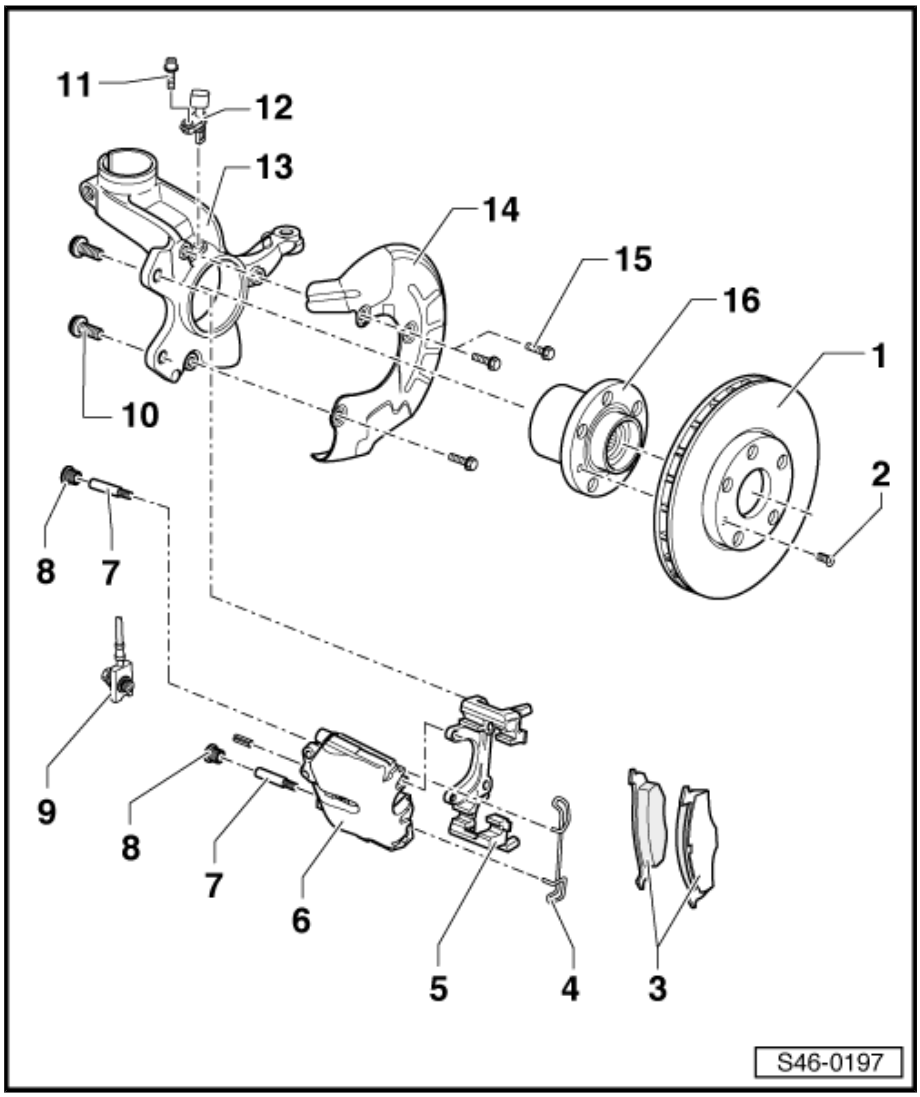
13 - ABS wheel speed sensor

- ❑ Removing and installing ⇒ “4.1 Removing and installing front speed sensors G45 / G47 ”, page 36

14 - Screw

- ❑ 8 Nm

1.1.2 Summary of components - front brake FN3



1 - Brake disc

- ❑ internally ventilated
- ❑ Dimensions and wear limit ⇒ “3.1.2 Front brakes”, page 3
- ❑ always replace axle-wise
- ❑ To remove, detach the brake caliper -6- and brake carrier -5- first
- ❑ Do not use force to separate the brake discs from the wheel hub, if necessary use rust solvent; as you could otherwise damage the brake discs.
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

2 - Screw

- ❑ 8 Nm

3 - Brake pads

- ❑ Dimensions and wear limit ⇒ “3.1.2 Front brakes”, page 3
- ❑ Inspect thickness ⇒ Maintenance ; Booklet Rapid NH
- ❑ Observe the instructions for changing the pad ⇒ “1.2.1 Changing the brake pads of the front brake - Mounting instructions”, page 41
- ❑ always replace axle-wise
- ❑ Removing and installing ⇒ “1.2.3 Removing and installing brake pads, brake calliper FN3”, page 44

4 - Spring

- ❑ inserted into both bore holes of the brake caliper

5 - Brake carrier

- ❑ screwed onto the wheel-bearing housing

6 - Brake caliper

- ❑ Removing and installing ⇒ “1.3.2 Removing and installing brake caliper FN3”, page 49
- ❑ Summary of components ⇒ “1.1.2 Exploded view – front brake caliper - brake FN3”, page 92
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

7 - Guide bolt

- ❑ 30 Nm

8 - Cap

- ❑ remove

9 - Brake hose

- ❑ with banjo union and hollow screw
- ❑ 35 Nm

10 - Screw

- ❑ clean when using again
- ❑ 124 Nm

11 - Screw

- ❑ 8 Nm

12 - ABS wheel speed sensor

- ❑ Removing and installing ⇒ “4.1 Removing and installing front speed sensors G45 / G47 ”, page 36

13 - Wheel bearing housing

14 - Cover plate

15 - Screw

- ❑ 12 Nm

16 - Wheel hub with wheel bearing

- ❑ for vehicles with ABS the sensor ring is built into the wheel hub

1.2 Removing and installing brake pads

⇒ “1.2.1 Changing the brake pads of the front brake - Mounting instructions”, page 41

⇒ “1.2.2 Removing and installing brake pads, floating caliper disc brake FS-III”, page 42

⇒ “1.2.3 Removing and installing brake pads, brake calliper FN3”, page 44

1.2.1 Changing the brake pads of the front brake - Mounting instructions

When changing the pads, pay attention to the following points:

– Check protective collar of brake calliper piston.

Replace protective cap if damaged.

When replacing the protective cap:

– Check the contact surfaces of the brake piston and the brake caliper for any dirt (oxidation).

Carefully clean the piston as well as the brake caliper if dirty and replace the sealing cap.

– Check the brake piston and the brake caliper (corrosion, grooves on the outside of the cylinder surface), replace the brake caliper completely if damaged.

For brake caliper piston, press into the initial position:

– Check if the piston can be slightly pressed into the brake caliper.

If the piston cannot be slightly pressed into the brake caliper:

– Check and clean the brake piston as well as the brake caliper, replace sealing sleeve and protective cap.

Replace the brake caliper completely if damaged.

1.2.2 Removing and installing brake pads, floating caliper disc brake FS-III

Special tools and workshop equipment required

♦ Piston jig - T10145-

Note

♦ *Observe the instructions for changing the pad* *⇒ "1.2.1 Changing the brake pads of the front brake - Mounting instructions", page 41* .

♦ *When removing mark the brake pads (inner, outer) you intend to keep using. Fit in same position when installing, or braking will be uneven!*

♦ *After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.*

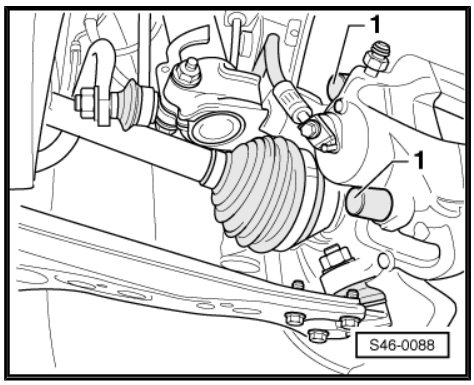
♦ *Do not unscrew the brake hose when replacing the brake pad.*

Removing

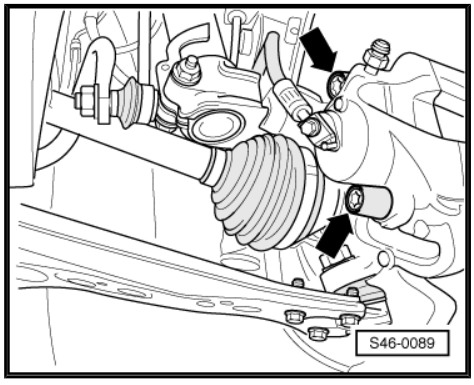
– Remove front wheels.

– If present, disconnect the connector for the brake pad wear indicator.

– Remove caps -1-.

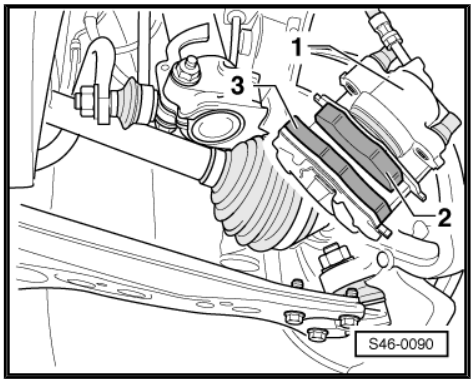


– Unscrew and remove the two guide bolts -arrows- from the brake caliper.



– Remove the brake caliper -1- and secure with wire in such a way that the weight of the brake caliper does not burden or damage the brake hose.

– Remove brake pads -2- and -3- from the brake caliper.



Clean

WARNING

Do not flush the brake system with compressed air. The dust that is generated is hazardous to health!

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

– Clean brake caliper.

Note

Use spirits only to clean the brake caliper housing.

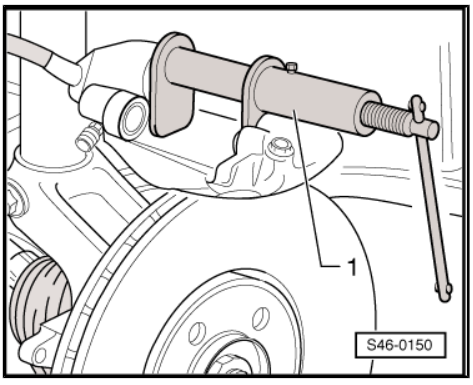
Installing

• Drain some brake fluid from the brake fluid reservoir before resetting the pistons. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.

WARNING

Brake fluid is toxic and must never be sucked up by mouth!

– Push piston back with piston jig - T10145- -1-.

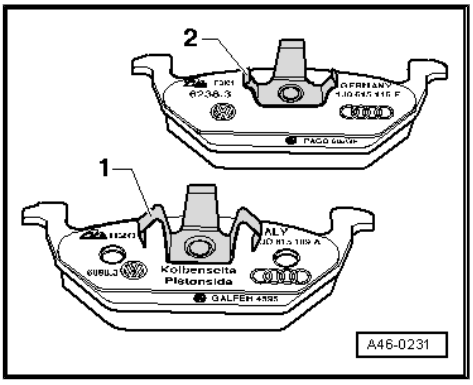


Note

Different version of the inner and outer brake pad. Do not mix up when installing

– Insert the inner brake pad -1- (with the large 3-finger clip with metallic gloss and with the marking “piston side” on the steel supporting plate) on the piston.

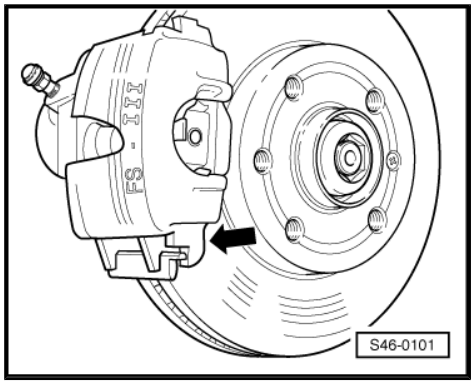
– Insert the outer brake pad -2- (with the small black 3-finger clip) into the brake caliper housing.



– First position the brake caliper with brake pads on the bottom wheel bearing housing -arrow-.

– Tilt the brake caliper so that the guide bolts of the brake caliper are flush with the threaded holes of the wheel-bearing housing.

The bolts of the brake caliper -arrows- must only be inserted into the brake caliper in such a way that the brake caliper can be tilted.



– Screw on both guide bolts -arrows- on the wheel bearing housing.

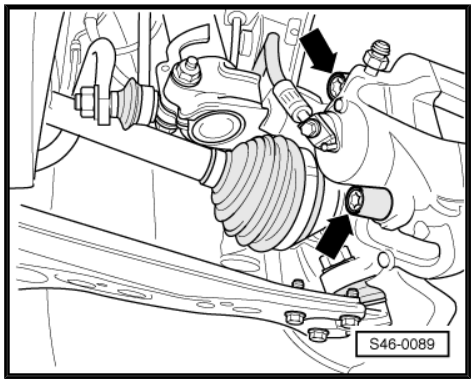
– Connect the plug connection for the brake pad wear indicator (where the vehicle is fitted with this).

– Insert the caps of the guide bolts.

– Install front wheels.

• After each brake pad replacement, forcefully apply the brake pedal repeatedly to ensure the brake pads go into their normal operating position.

• Check brake fluid level after replacing the brake pads, if necessary top up with brake fluid.



Tightening torques

◆ ⇒ “1.1.1 Summary of components - front brake FS-III”, page 38

◆ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

1.2.3 Removing and installing brake pads, brake calliper FN3

Special tools and workshop equipment required

◆ Piston jig - T10145-

• Observe the instructions for changing the pad ⇒ “1.2.1 Changing the brake pads of the front brake - Mounting instructions”, page 41 .

• When removing mark the brake pads (inner, outer) you intend to keep using. Fit in same position when installing, or braking will be uneven!

• After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.

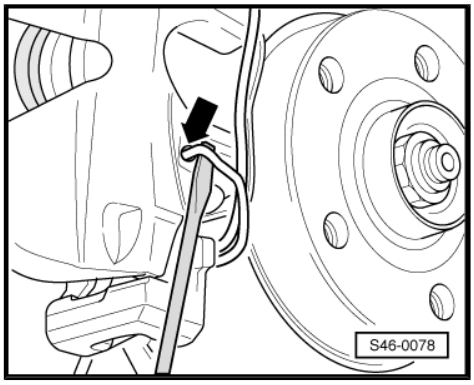
• Do not unscrew the brake hose when replacing the brake pad.

Removing

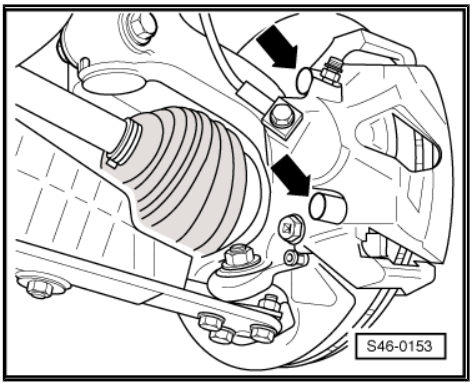
– Remove front wheels.

– If present, disconnect the connector for the brake pad wear indicator.

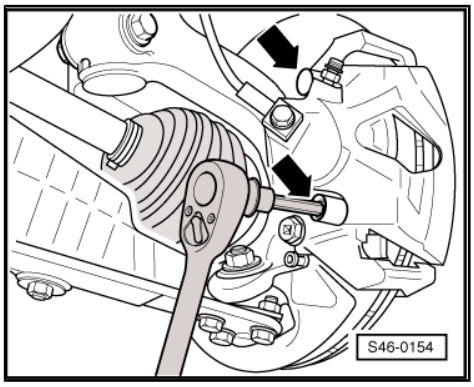
– Lever up the retaining spring of the brake pads out of the brake caliper -arrow- using a screwdriver and remove.



– Remove caps -arrows-.



– Loosen and remove the two guide bolts -arrows- from the brake caliper.
– Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.
– Take out the brake pads from the brake caliper or from the brake carrier.



Clean

WARNING

Do not flush the brake system with compressed air. The dust that is generated is hazardous to health!

– Thoroughly clean guiding surface for brake pads on brake carrier and remove corrosion.
– Clean brake caliper.

Note

Use spirits only to clean the brake caliper housing.

Installing

• Drain some brake fluid from the brake fluid reservoir before resetting the pistons. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.

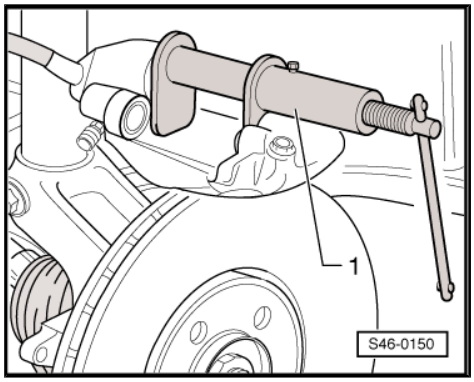
WARNING

Brake fluid is toxic and must never be sucked up by mouth!

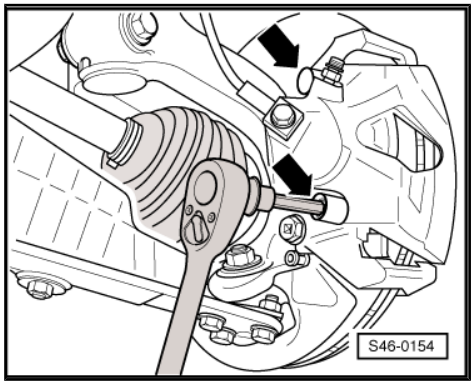
– Push piston back with piston jig - T10145- -1-.
– Remove the protective foil from the supporting plate of the outer brake pad.
– Place the outer brake pad on the brake carrier.
– Insert the inner brake pad with retaining spring into the brake caliper (piston).

When installing the brake caliper make sure that the brake pad does not stick to the brake caliper before reaching its correct installed position.

Do not damage the surface to be glued.



– Screw the brake caliper with both guide bolts to the brake carrier.
– Insert both caps.
– Insert retaining spring in brake caliper.
– If present, connect the connector for the brake pad wear indicator.
– Attach the wheels.
• After each brake pad replacement, forcefully apply the brake pedal repeatedly to ensure the brake pads go into their normal operating position.
• Check brake fluid level after changing brake pads.



Tightening torques

♦ ⇒ “1.1.2 Summary of components - front brake FN3”, page 40
♦ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

1.3 Removing and installing brake caliper

⇒ “1.3.1 Removing and installing brake caliper FS-III”, page 46

⇒ “1.3.2 Removing and installing brake caliper FN3”, page 49

1.3.1 Removing and installing brake caliper FS-III

Special tools and workshop equipment required

♦ Brake pedal load e.g. -V.A.G 1869/2-
♦ Bleeding bottle (commercially available)

Note

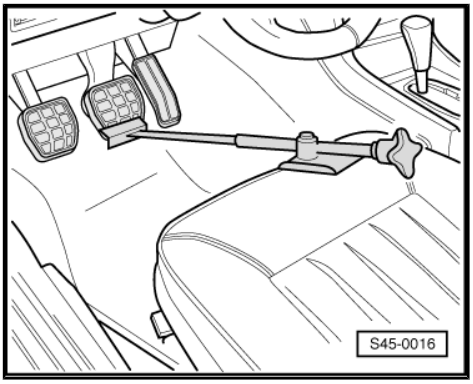
- *Observe the instructions for changing the pad* *⇒ "1.2.1 Changing the brake pads of the front brake - Mounting instructions", page 41* .
- *When removing mark the brake pads (inner, outer) you intend to keep using. Fit in same position when installing, or braking will be uneven!*
- *After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.*
- *Do not unscrew the brake hose when replacing the brake pad.*

Removing

– Remove front wheel.

– If present, disconnect the connector for the brake pad wear indicator.

– Brake pedal load e.g. -V.A.G 1869/2-



– Attach the bleeder hose of the bleeding bottle onto the vent valve of the brake caliper and then open then bleeder valve.

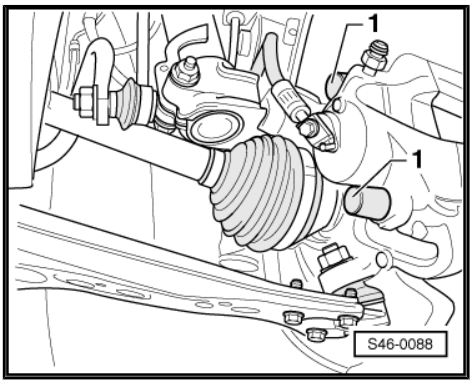
– Press the brake pedal by at least 60 mm and lock with brake pedal load , e. g. -V.A.G 1869/2- .

– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .

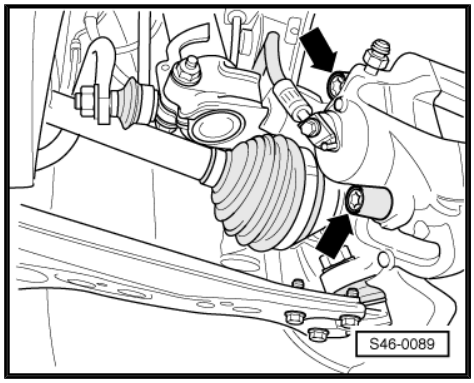
– Close the vent valve and remove the bleeding bottle.

– Remove brake hose.

– Remove caps -1-.



– Unscrew and remove the two guide bolts -arrows- from the brake caliper.
– Remove brake calliper from the wheel bearing housing.
– Take out the brake pads from the brake caliper.



Clean

WARNING

Do not flush the brake system with compressed air. The dust that is generated is hazardous to health!

– Thoroughly clean guiding surface for brake pads on brake carrier and remove corrosion.
– Clean brake caliper.

Note

Use spirits only to clean the brake caliper housing.

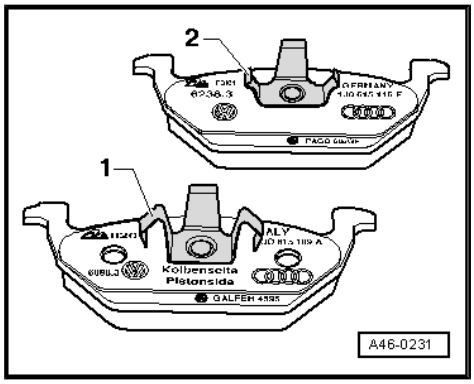
Installing

• The piston is pushed back.

Note

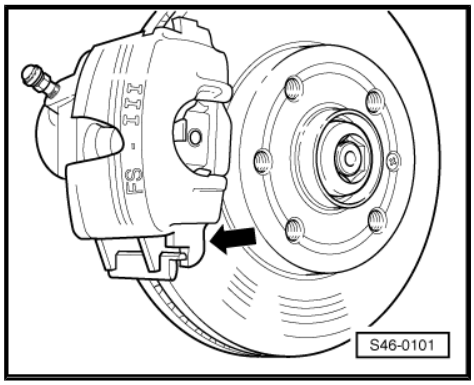
Different version of the inner and outer brake pad. Do not mix up when installing

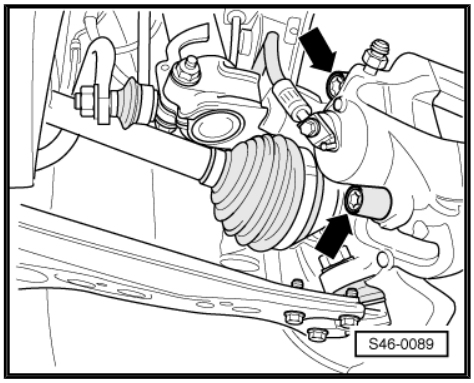
– Insert the inner brake pad -1- (with the large 3-finger clip with metallic gloss and with the marking “piston side” on the steel supporting plate) on the piston.
– Insert the outer brake pad -2- (with the small black 3-finger clip) into the brake caliper housing.



– First, position the brake caliper with the brake pads at the bottom -arrow- of the brake carrier.
– Tilt the brake caliper so that the guide bolts of the brake caliper are flush with the threaded holes of the wheel-bearing housing.

The bolts of the brake caliper -arrows- must only be inserted into the brake caliper in such a way that the brake caliper can be tilted.





– Screw on both guide bolts -arrows- on the wheel bearing housing.
– If present, connect the connector for the brake pad wear indicator.
– Insert the caps of the guide bolts.
– Bolt brake hose to brake caliper.
– Remove brake pedal load e.g. -V.A.G 1869/2- .
– Bleed brake system
⇒ “6.2 Prebleeding the hydraulic system”, page 152 .
– Install wheel ⇒ Wheels, Tyres; Rep. gr. 44 .

• 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.

Tightening torques

♦ ⇒ “1.1.1 Summary of components - front brake FS-III”, page 38
♦ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

1.3.2 Removing and installing brake caliper FN3

Special tools and workshop equipment required

♦ Brake pedal load , e.g. -V.A.G 1869/2-

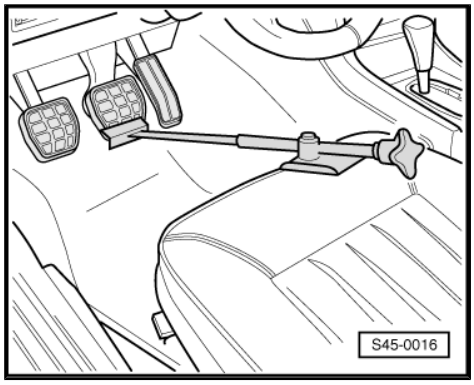
Note

♦ *Observe the instructions for changing the pad*
⇒ “1.2.1 Changing the brake pads of the front brake - Mounting instructions”, page 41 .
♦ *When removing mark the brake pads (inner, outer) you intend to keep using. Fit in same position when installing, or braking will be uneven!*
♦ *After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.*
♦ *Do not unscrew the brake hose when replacing the brake pad.*

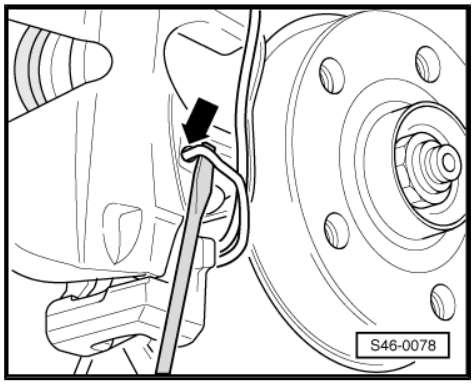
Removing

– Remove front wheel.
– If present, disconnect the connector for the brake pad wear indicator.

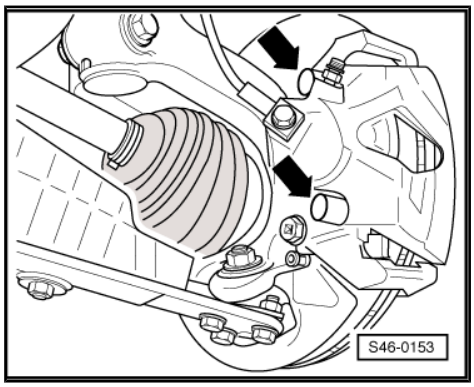
– Insert brake pedal load, , e.g. -V.A.G 1869/2- .
– Attach the bleeder hose of the bleeding bottle onto the vent valve of the brake caliper and then open then bleeder valve.
– Press the brake pedal by at least 60 mm and lock with brake pedal load , e. g. -V.A.G 1869/2- .
– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .
– Close the vent valve and remove the bleeding bottle.



– Lever up the retaining spring of the brake pads out of the brake caliper -arrow- using a screwdriver and remove.



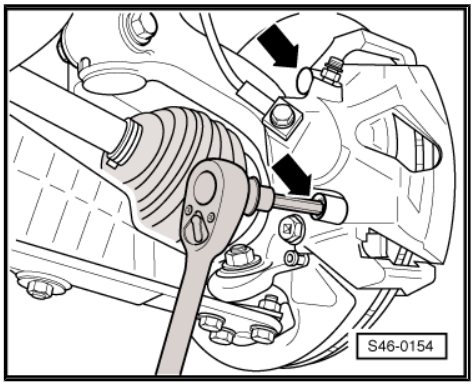
– Remove caps -arrows-.



– Loosen and remove the two guide bolts -arrows- from the brake caliper.

– Pull off brake caliper from brake carrier.

– Take out the brake pads from the brake caliper.



Clean

WARNING

Do not flush the brake system with compressed air. The dust that is generated is hazardous to health!

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

– Clean brake caliper.

Note

Use spirits only to clean the brake caliper housing.

Installing

- The piston is pushed back.
- The outside brake pad is fitted on the brake carrier.

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

When installing the brake caliper make sure that the brake pad does not stick to the brake caliper before reaching its correct installed position.

Do not damage the surface to be glued.

– Screw the brake caliper with both guide bolts to the brake carrier.

– Insert both caps.

– Bolt brake hose to brake caliper.

– Remove brake pedal load e.g. -V.A.G 1869/2- .

– Insert retaining spring in brake caliper.

– If present, connect plug connection of the brake pad wear indicator.

– Bleed brake system
⇒ “6.2 Prebleeding the hydraulic system”, page 152 .

– Attach the wheels.

- 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.

Tightening torques

◆ ⇒ “1.1.2 Summary of components - front brake FN3”, page 40

◆ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

2 Rear brakes

⇒ “2.1 Assembly overview - rear brakes”, page 52

⇒ “2.2 Removing and installing brake pads”, page 58

⇒ “2.3 Removing and installing brake caliper”, page 61

⇒ “2.4 Resetting brake”, page 63

⇒ “2.5 Removing and installing brake anchor plate”, page 64

⇒ “2.6 Removing and installing wheel-brake cylinder”, page 65

⇒ “2.7 Removing and installing brake shoes”, page 66

2.1 Assembly overview - rear brakes

⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52

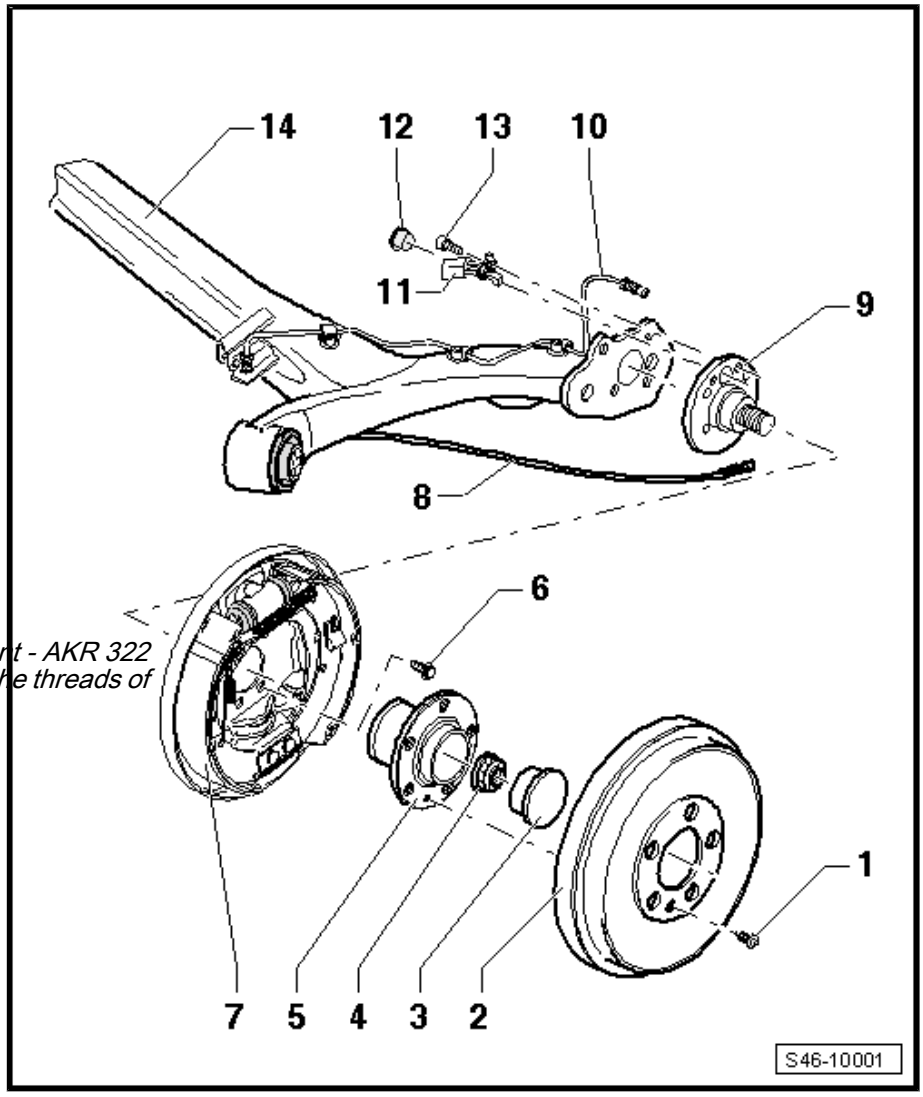
⇒ “2.1.2 Summary of components - drum brake”, page 54

⇒ “2.1.3 Summary of components - rear axle brake, disc brake”, page 56

2.1.1 Summary of components - rear axle brake, drum brake

Note

- *Brake inspection ⇒ “4 Brake inspection”, page 6 .*
- *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.*
- *Generally tighten the brake line pipe screws to a tightening torque of 14 Nm.*
- *Use a bleeding bottle, that only comes into contact with the brake fluid, to drain brake fluid from the brake fluid reservoir. Brake fluid is toxic and must never be sucked up by mouth!*
- *Use brake pedal load , e. g. -V.A.G 1869/2- , before removing a brake cylinder, a brake carrier or before separating a brake line from the brake cylinder.*



1 - Screw

- ❑ 8 Nm

2 - Brake drum

- ❑ Brake drum diameter, wear limit ⇒ “3.1.3 Rear brake”, page 4
- ❑ clean carefully, and check damage, dimensional accuracy and perfect brake surface
- ❑ Thoroughly clean the centering hole of the drum before installing and subsequently treat it with approx. 0.5 g of anti-corrosion agent - AKR 322 000-

Note

The anti-corrosion agent - AKR 322 000- must not get into the threads of the wheel screws!

3 - Cap

- ❑ Replace after removal
- ❑ Driving in and out ⇒ Axles, steering; Rep. gr. 42 .

4 - Nut

- ❑ self-locking
- ❑ Replace after removal ⇒ Axles, steering; Rep. gr. 42

5 - Wheel hub with wheel bearing

- ❑ Sensor ring for ABS is built into the wheel hub
- ❑ must be replaced completely
- ❑ removing and installing ⇒ Axles, steering; Rep. gr. 42
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts
- ❑ Before installing the brake drum, thoroughly clean the centering shoulder for the brake drum and subsequently treat it with approx. 0.5 g of anti-corrosion agent - AKR 322 000-

Note

The anti-corrosion agent - AKR 322 000- must not get into the threads of the wheel screws!

6 - Screw

- ❑ Replace after removal
- ❑ Tightening torque ⇒ Axles, steering; Rep. gr. 42

7 - Brake carrier with brake shoes

- ❑ Removing and installing ⇒ “2.5 Removing and installing brake anchor plate”, page 64
- ❑ Summary of components ⇒ “2.1.2 Summary of components - drum brake”, page 54

8 - Handbrake

- ❑ Adjusting parking brake ⇒ “3.2 Adjusting parking brake”, page 72 .

9 - Axle stud

- ❑ removing and installing ⇒ Axles, steering; Rep. gr. 42
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

10 - Brake line

- ❑ 14 Nm

11 - ABS wheel speed sensor

12 - Plug

- ❑ for vehicles without ABS
- ❑ to plug the hole for the speed sensor in the axle stud
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

13 - Screw

- ❑ 8 Nm

14 - Axle beam

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

2.1.2 Summary of components - drum brake

1 - Wheel-brake cylinder

- ❑ Repairs not allowed
- ❑ Check for leaks ⇒ page 56
- ❑ Removing and installing ⇒ “2.6 Removing and installing wheel-brake cylinder”, page 65

2 - Brake carrier

3 - Fit pin

4 - Screw

- ❑ 10 Nm

5 - Ventilation valve cap

6 - Vent valve

- ❑ 10 Nm

7 - Plug

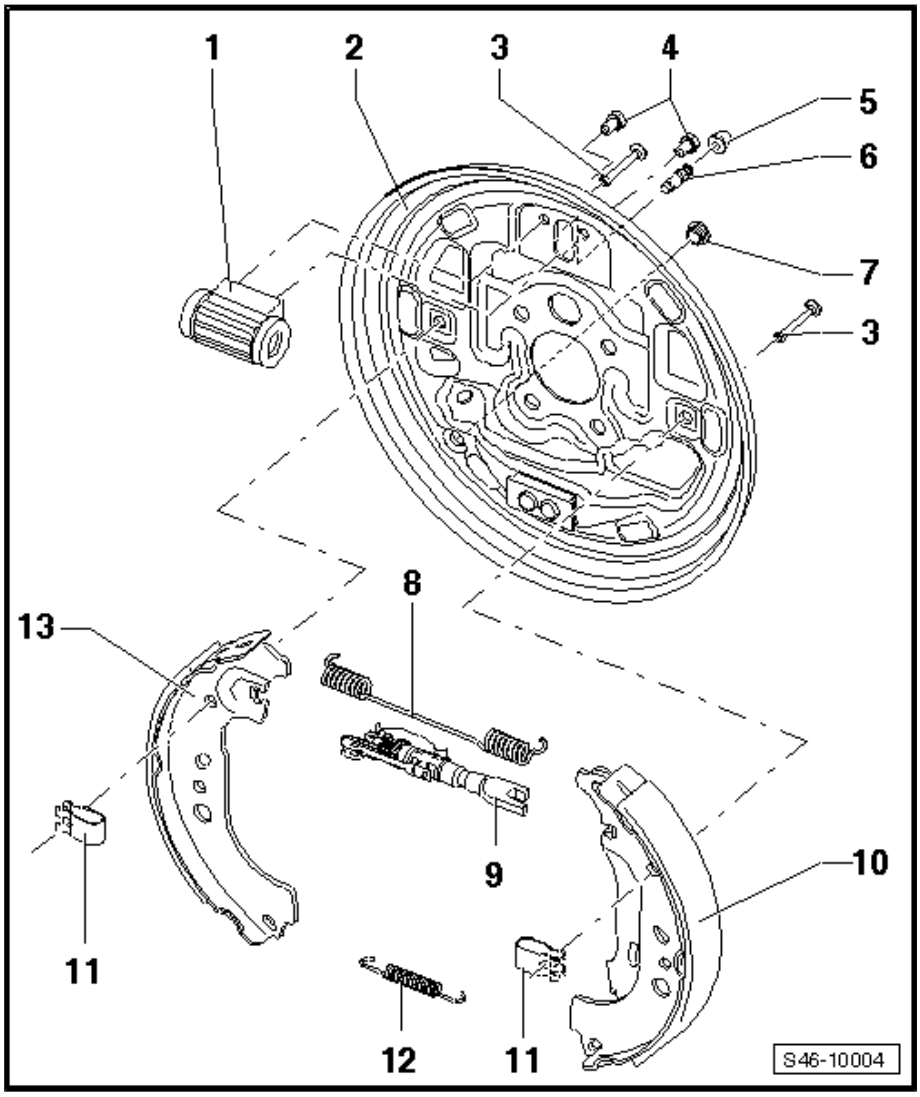
- ❑ remove to check brake pad thickness

8 - Top brake spring

- ❑ Grease contact surfaces with solid lubricant paste - G 000 650-

9 - Expansion rod

- ❑ with thermal clip
- ❑ with setting wheel and self-adjuster
- ❑ Fitting position ⇒ page 56
- ❑ Grease contact surfaces with solid lubricant paste - G 000 650-



10 - Brake shoe

- ❑ with lever for hand-brake
- ❑ Dimensions and wear limit ⇒ “3.1.3 Rear brake”, page 4
- ❑ Check pad thickness ⇒ page 56
- ❑ Observe the instructions when replacing the brake shoes ⇒ “2.7.1 Replacing the brake shoes of the rear brake - Mounting instructions”, page 66
- ❑ Removing and installing ⇒ “2.7.2 Removing and installing brake shoes”, page 67
- ❑ Setting the hand-brake ⇒ “3.2 Adjusting parking brake”, page 72

11 - Clamp

- ❑ for locking the brake shoe
- ❑ Fitting position ⇒ page 55

12 - Bottom retractor spring

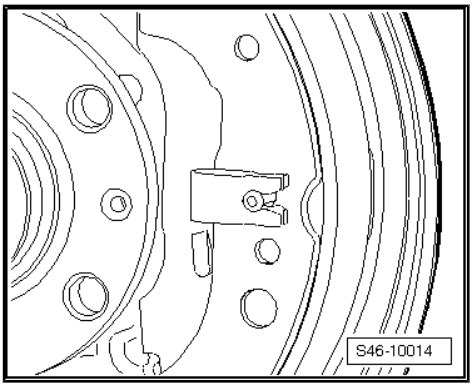
- ❑ Grease contact surfaces with solid lubricant paste - G 000 650-

13 - Brake shoe

- ❑ Dimensions and wear limit ⇒ “3.1.3 Rear brake”, page 4
- ❑ Check pad thickness ⇒ page 56
- ❑ Removing and installing ⇒ “2.7.2 Removing and installing brake shoes”, page 67
- ❑ always replace axle-wise

Fitting position of securing clamp

The securing clamp must point with its closed part to the wheel hub.



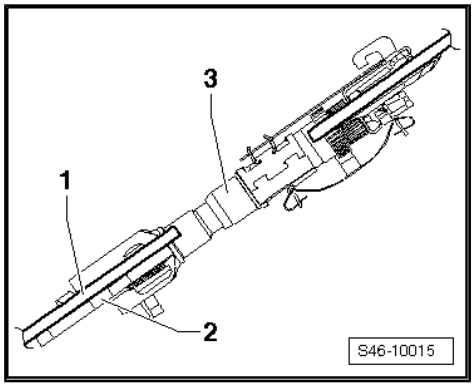
Fitting position of expansion rod

1 - Brake shoe

2 - Handbrake lever

3 - Expansion rod with thermal clip

- Thermal clip - bimetal strip must point towards the brake drum.



Checking wheel-brake cylinder for leaks

Note

- *The tightness test is performed only visually without using any tools and without removing the dust cap.*
- *The dust cap may get damaged in case of removal.*
- *Slight traces of grease in the area of the wheel-brake cylinder do not point to a leakage. It is essentially assembly grease.*

– Check the wheel-brake cylinder.

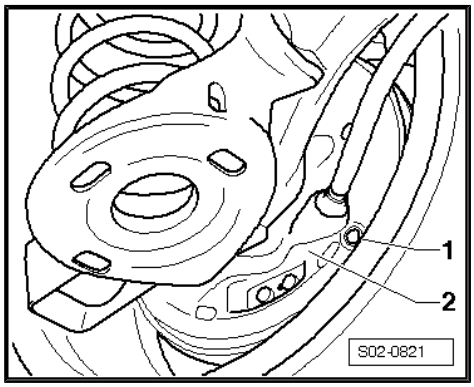
– If brake fluid drips out of the wheel-brake cylinder, the wheel-brake cylinder must be replaced
⇒ “2.6 Removing and installing wheel-brake cylinder”, page 65 .

Checking the brake pad thickness through the inspection hole in the brake carrier

– Loosen the cap -1- from the brake carrier -2-.

– Checking the brake pad thickness through the inspection hole in the brake carrier.

Minimum pad thickness without supporting shoe (wear dimension).



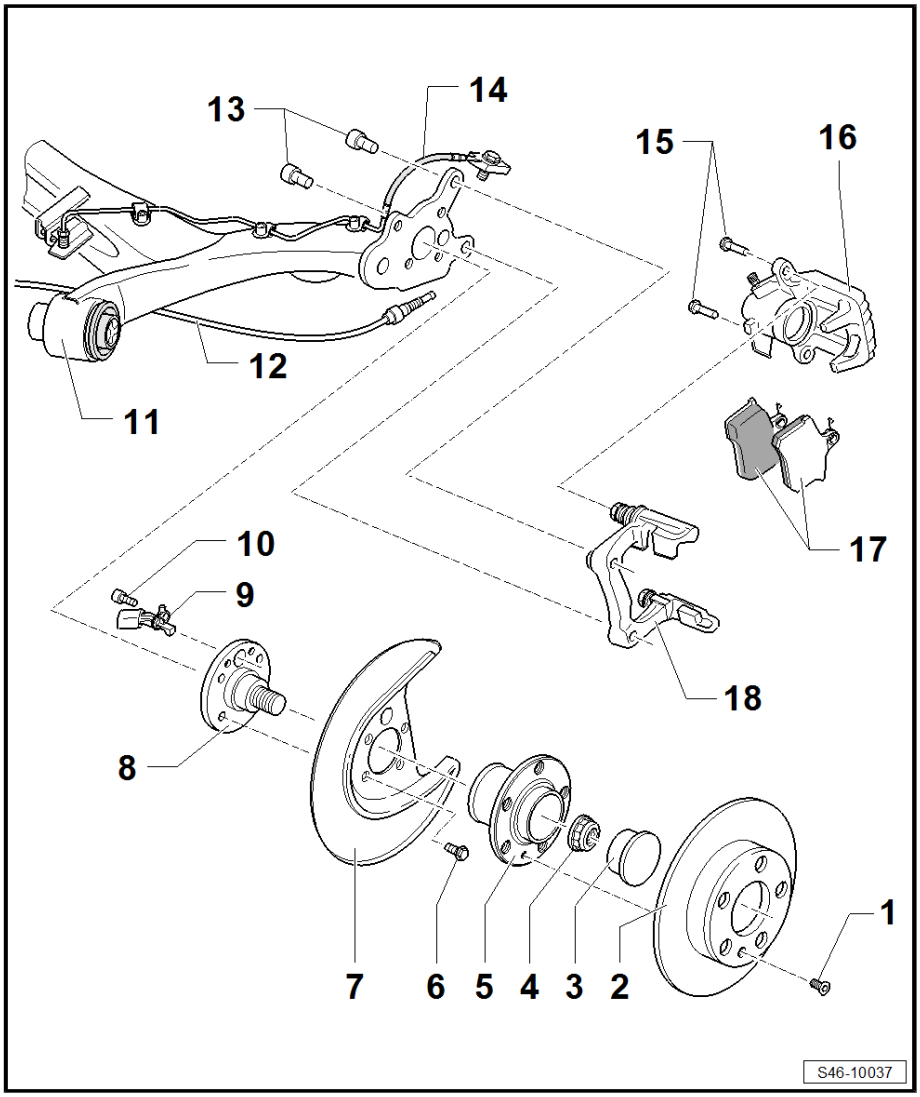
Note

The brake pads must not be soiled with brake fluid or grease.

2.1.3 Summary of components - rear axle brake, disc brake

Note

- *Observe the instructions for changing the pad*
⇒ “2.2.1 Changing the brake pads of the rear brake - Mounting instructions”, page 58
- *Brake inspection* *⇒ “4 Brake inspection”, page 6* .
- *After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.*
- *Use the brake filling and bleeding device , e.g. -VAS 5234- , to drain the brake fluid from the brake fluid reservoir.*
- *Use the brake pedal load , e.g. -V.A.G 1869/2- , before removing a brake calliper or separating a brake hose from the brake calliper.*
- *Generally tighten the brake line pipe screws to a tightening torque of 14 Nm.*



1 - Screw

- ❑ 8 Nm

2 - Brake disc

- ❑ Dimensions and wear limit ⇒ “3.1.3 Rear brake”, page 4
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts
- ❑ always replace axle-wise
- ❑ unscrew the brake caliper before removing

3 - Cap

- ❑ Replace after removal
- ❑ pressing off and driving in ⇒ chassis, axles, steering; Rep. gr. 42

4 - Nut

- ❑ self-locking
- ❑ Tightening torque ⇒ Chassis, axles, steering; Rep. gr. 42 .

5 - Wheel hub with wheel bearing

- ❑ must be replaced completely
- ❑ removing and installing ⇒ chassis, axles, steering; Rep. gr. 42
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

6 - Screw

- ❑ Replace after removal
- ❑ Tightening torque ⇒ Chassis, axles, steering; Rep. gr. 42 .

7 - Cover plate

8 - Axle stud

9 - ABS wheel speed sensor

10 - Screw

- ❑ 8 Nm

11 - Axle beam

12 - Handbrake

- ❑ Adjusting parking brake ⇒ “3.2 Adjusting parking brake”, page 72 .

13 - Hexagon socket head bolt

- ❑ Replace after removal
- ❑ 30 Nm + 30°.

14 - Brake line

- ❑ with supports, hollow bolt and seal
- ❑ must be replaced completely, do not dismantle
- ❑ do not unscrew when replacing the brake pad

- ❑ 38 Nm

15 - Screw

- ❑ self-locking
- ❑ Replace after removal
- ❑ 35 Nm

16 - Brake caliper

- ❑ Removing and installing ⇒ “2.3 Removing and installing brake caliper”, page 61

17 - Brake pads

- ❑ Dimensions and wear limit ⇒ “3.1.3 Rear brake”, page 4
- ❑ Inspect thickness ⇒ Maintenance ; Booklet Rapid NH
- ❑ Observe the instructions for changing the pad ⇒ “2.2.1 Changing the brake pads of the rear brake - Mounting instructions”, page 58
- ❑ always replace axle-wise
- ❑ Removing and installing ⇒ “2.2.2 Removing and installing brake pads”, page 58

18 - Brake carrier with guide bolts and protective caps

- ❑ must be assembled with sufficient grease on the guide bolt, supplied as a spare part
- ❑ fit a repair set if there is any damage to the protective caps or guide bolts; (use the enclosed grease packing to lubricate the guide bolts)
- ❑ Observe the instructions for changing the pad ⇒ “2.2.1 Changing the brake pads of the rear brake - Mounting instructions”, page 58

2.2 Removing and installing brake pads

⇒ “2.2.1 Changing the brake pads of the rear brake - Mounting instructions”, page 58

⇒ “2.2.2 Removing and installing brake pads”, page 58

2.2.1 Changing the brake pads of the rear brake - Mounting instructions

When changing the pads, pay attention to the following points:

– Check protective collar of brake calliper piston.

Replace protective cap if damaged.

When replacing the protective cap:

– Check the contact surfaces of the brake piston and the brake caliper for any dirt (oxidation).

Carefully clean the piston as well as the brake caliper if dirty and replace the sealing cap.

– Check the brake piston and the brake caliper (corrosion, grooves on the outside of the cylinder surface), replace the brake caliper completely if damaged.

For brake caliper piston, press into the initial position:

– Check if the piston can be slightly pressed into the brake caliper.

If the piston cannot be slightly pressed into the brake caliper:

– Check and clean the brake piston as well as the brake caliper, replace sealing sleeve and protective cap.

Replace the brake caliper completely if damaged.

2.2.2 Removing and installing brake pads

Special tools and workshop equipment required

- Resetting tool - T 10165-

Note

- *Observe the instructions for changing the pad* *⇒ "2.2.1 Changing the brake pads of the rear brake - Mounting instructions", page 58* .
- *When removing mark the brake pads (inner, outer) you intend to keep using. Fit in same position when installing, or braking will be uneven!*
- *Do not unscrew the brake hose when replacing the brake pad.*

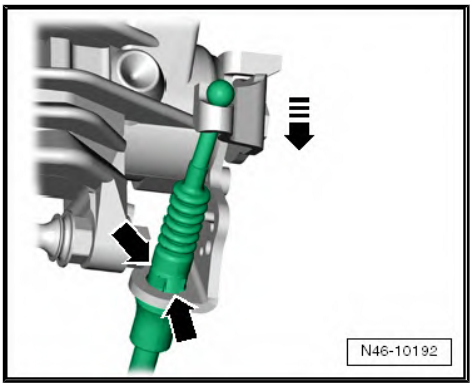
Removing

– Remove wheel.

– If present, disconnect the connector for the brake pad wear indicator.

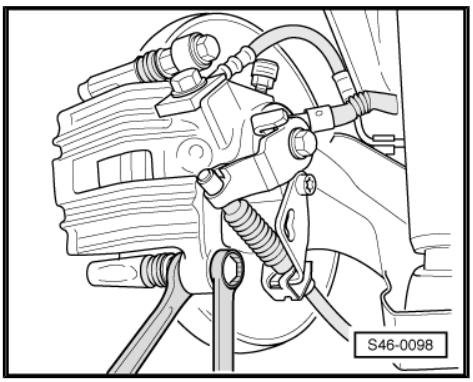
– Push the brake lever -in direction of arrow- and unhook the hand-brake cable.

– Slacken the spring bushing -arrows- for the hand-brake cable from the bracket on the brake caliper.

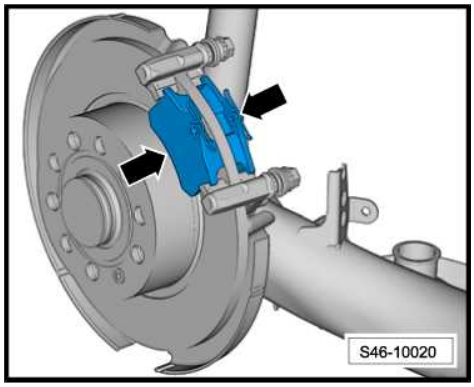


– Unscrew the fixing screws of the brake carrier while counter-holding the guide bolts.

– Remove brake caliper and secure with wire so that weight of brake caliper does not strain or damage brake hose.



– Take out the brake pads -arrows-.



Clean

WARNING

Do not flush the brake system with compressed air. The dust that is generated is hazardous to health!

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

– Clean brake caliper.

Note

Use spirits only to clean the brake caliper housing.

Installing

Note

- *Observe the instructions for changing the pad ⇒ "2.2.1 Changing the brake pads of the rear brake - Mounting instructions", page 58 .*
- *The adherend for the brake pads must be free from glue residues and grease.*
- *Drain the brake fluid from the brake fluid reservoir using a ventilation bottle before resetting the piston. Otherwise, particularly if reservoir has been topped up, fluid will overflow and cause damage.*
- *When resetting the piston with a piston resetting device the automatic reset in the brake caliper is destroyed.*

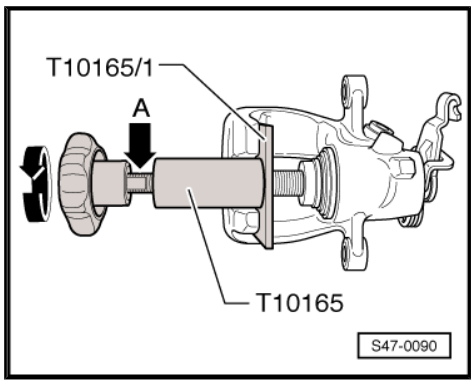
WARNING

Brake fluid is toxic and must never be sucked up by mouth!

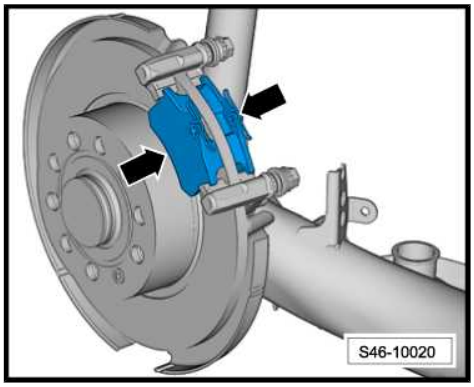
– Screw in the piston by turning the knurled wheel clockwise on the resetting tool - T10165- , during this procedure do not damage the protective cap.

Use open-jawed spanner on the provided spanner surfaces arrow -A- if the piston is difficult to move.

- Turn the resetting tool - T10165- simultaneously when resetting the piston, in order to initiate pressure onto the piston.



– Insert the new brake pads -arrows- in the brake carrier.
– Remove the protective foil from the supporting plate of the brake pad.

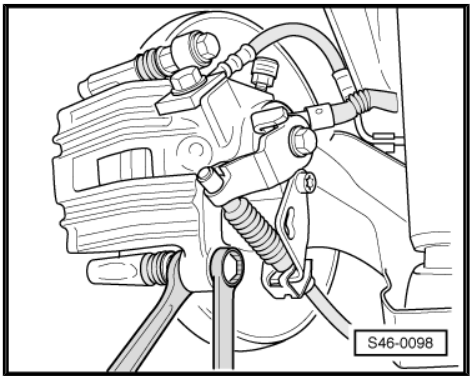


Note

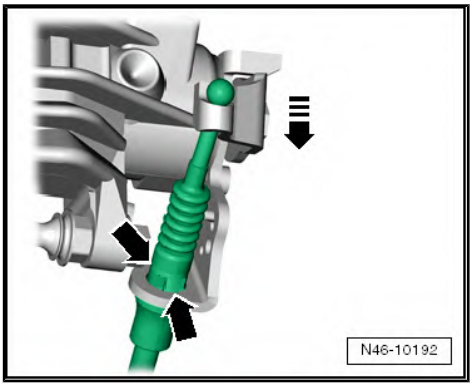
There are four self-locking screws in the repair set, which must be fitted.

– Secure the brake caliper to the brake carrier using new self-locking screws.

  Hold the guide bolts while tightening the screws.



– Insert the spring bushing for the handbrake cable into the holder of the brake calliper until the spring pegs -arrows- audibly engage.
– Push the brake lever in -direction of arrow- and hook in the hand-brake cable.
– If present, connect the connector for the brake pad wear indicator.



Note

- *After each brake pad replacement, forcefully apply the brake pedal repeatedly to ensure the brake pads go into their normal operating position.*
- *Check brake fluid level after replacing the brake pads, if necessary top up with brake fluid.*

– Adjust handbrake
⇒ “3.2 Adjusting parking brake”, page 72 .
– Attach the wheel.

Tightening torques

- ⇒ “2.1.3 Summary of components - rear axle brake, disc brake”, page 56
- Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

2.3 Removing and installing brake caliper

Special tools and workshop equipment required

- Brake pedal load , e.g. -V.A.G 1869/2-
- Bleeding bottle (commercially available)

Removing

Note

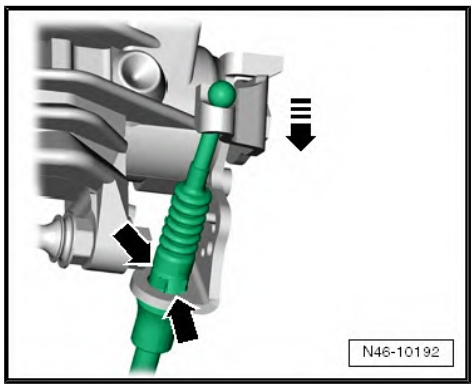
- *Observe the instructions for changing the pad* *⇒ "1.2.1 Changing the brake pads of the front brake - Mounting instructions", page 41* .
- *When removing mark the brake pads (inner, outer) you intend to keep using. Fit in same position when installing, or braking will be uneven!*
- *After replacing the brake pads, depress brake pedal firmly several times when the vehicle is stationary to ensure the brake pads are properly seated in their normal operating position.*
- *Do not unscrew the brake hose when replacing the brake pad.*

– Remove wheel.

– Push the brake lever -in direction of arrow- and unhook the hand-brake cable.

– Release the two retaining tabs -arrows- and undo the spring bushing for the handbrake cable from the holder on the brake calliper.

– Attach the bleeder hose of the bleeding bottle onto the vent valve of the brake caliper and open bleeder valve.

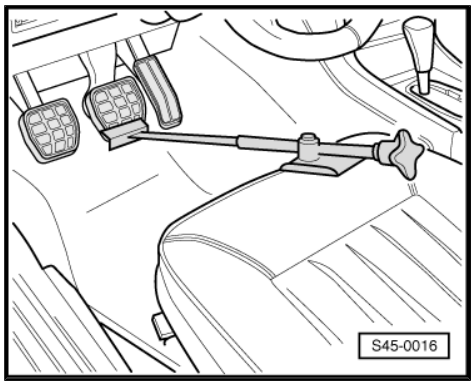


– Position the brake pedal load , e.g. -V.A.G 1869/2 - and press down the brake pedal at least 60 mm.

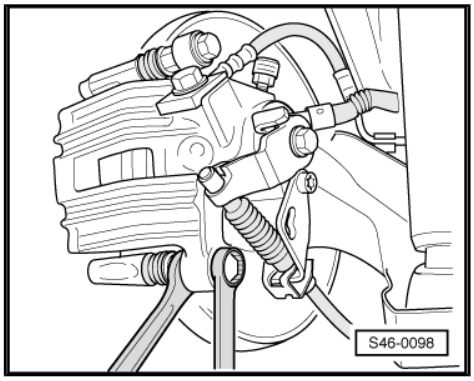
– Close the vent valve and remove the bleeding bottle.

– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .

– Remove brake line from brake caliper.



– Unscrew the fixing screws of the brake carrier while counter-holding the guide bolts.
– Remove brake caliper from brake carrier



Clean

WARNING

Do not flush the brake system with compressed air. The dust that is generated is hazardous to health!

– Thoroughly clean guiding surface for brake pads on brake carrier and remove corrosion.
– Clean brake caliper.

Note

Use spirits only to clean the brake caliper housing.

Installing

• The piston is pushed back.
– Secure the brake caliper to the brake carrier using new self-locking screws.
– Fit brake line to the brake caliper.
– Install hand-brake cable.
– Bleed brake system
⇒ “6.2 Prebleeding the hydraulic system”, page 152 .
– Adjust handbrake
⇒ “3.2 Adjusting parking brake”, page 72 .
– Attach the 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.*

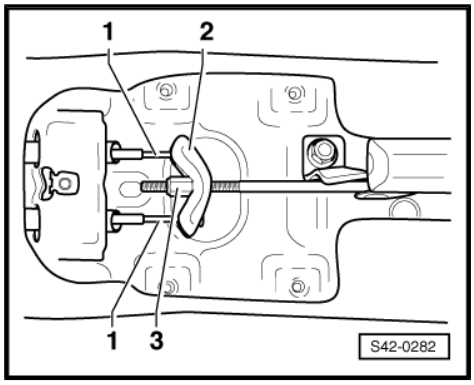
Tightening torques

♦ ⇒ “2.1.3 Summary of components - rear axle brake, disc brake”, page 56
♦ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

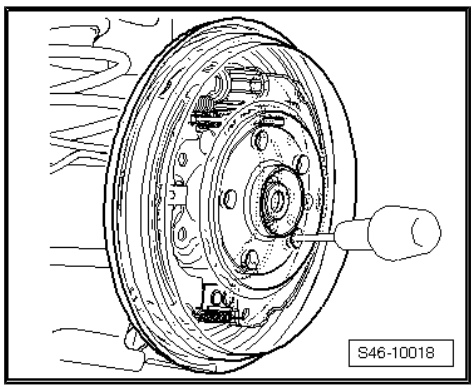
2.4 Resetting brake

– Put hand-brake back.
– Remove storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .

– Release resetting nut -3- and unhook hand-brake cables -1- from compensating clamp -2-.



– Press the handbrake lever through a hole for the wheel screw using a screwdriver.



2.5 Removing and installing brake anchor plate

Special tools and workshop equipment required

- Brake pedal load , e.g. -V.A.G 1869/2-
- Bleeding bottle (commercially available)

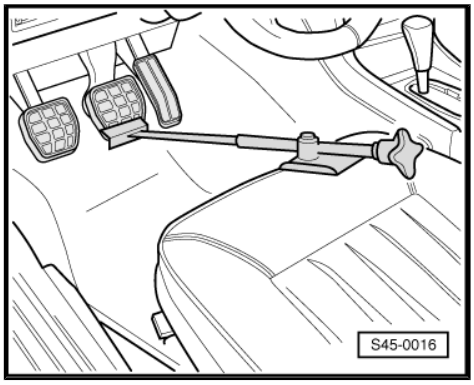
Removing

– Resetting brake ⇒ “2.4 Resetting brake”, page 63 .

– Unscrew screw, position -1-
⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52 .

– Remove the brake drum.

– Remove wheel hub with wheel bearing ⇒ Axles, steering; Rep. gr. 42 .



– Position brake pedal load , e.g. -V.A.G 1869/2- .
– Fit the bleeder hose of the bleeding bottle onto the bleeder valve and release bleeder valve.
– Press down brake pedal with brake pedal load , e.g. -V.A.G 1869/2- , at least 60 mm.
– Tighten the drain plug.
– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .
– Remove screws position -6-
⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52 .
– Remove brake carrier.
– Unhook hand-brake cable where applicable.

Installing

– Install brake carrier.
– Screw on screws, position -6-
⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52 .
– Hook hand-brake cable where applicable.
– Install wheel hub with wheel bearing ⇒ Axles, steering; Rep. gr. 42 .
– Screw on the brake line.
– Remove brake pedal load .
– Install brake drum.
– Insert screw position -1-
⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52 .
– Bleed brake system
⇒ “6.2 Prebleeding the hydraulic system”, page 152 .

Tightening torques

♦ ⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52

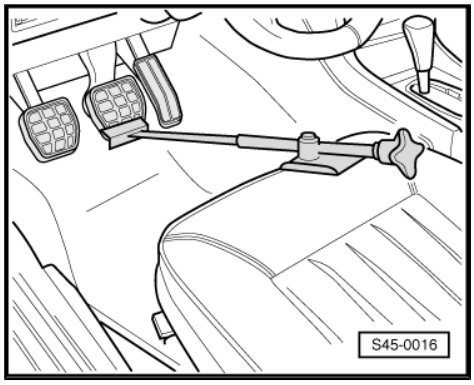
2.6 Removing and installing wheel-brake cylinder

Special tools and workshop equipment required

♦ Brake pedal load , e.g. -V.A.G 1869/2-
♦ Bleeding bottle (commercially available)

Removing

– Remove the brake shoes
⇒ “2.7.2 Removing and installing brake shoes”, page 67 .



– Insert brake pedal load, , e.g. -V.A.G 1869/2- .
– Fit the bleeder hose of the bleeding bottle onto the vent valve of the wheel-brake cylinder.
– Open vent valve.
– Press the brake pedal by at least 60 mm and lock with brake pedal load , e. g. -V.A.G 1869/2- .
– Shut the vent valve once the brake fluid flowed out.
– Do not remove brake pedal load , e. g. -V.A.G 1869/2- .
– Remove brake line.
– Remove screws Pos. -4-
⇒ “2.1.2 Summary of components - drum brake”, page 54 .
– Remove wheel-brake cylinder.

Installing

– Insert the wheel-brake cylinder.
– Install screws Pos. -4-
⇒ “2.1.2 Summary of components - drum brake”, page 54 .
– Install brake line.
– Remove brake pedal load .
– Install the brake shoes
⇒ “2.7.2 Removing and installing brake shoes”, page 67 .
– Bleed brake system
⇒ “6.2 Prebleeding the hydraulic system”, page 152 .

Tightening torques

◆ ⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52
◆ ⇒ “2.1.2 Summary of components - drum brake”, page 54

2.7 Removing and installing brake shoes

⇒ “2.7.1 Replacing the brake shoes of the rear brake - Mounting instructions”, page 66

⇒ “2.7.2 Removing and installing brake shoes”, page 67

2.7.1 Replacing the brake shoes of the rear brake - Mounting instructions

When changing the brake shoes, pay attention to the following points:

– Check the protective collars of the wheel-brake cylinders.

Replace the wheel-brake cylinders if the protective collars are damaged
⇒ “2.6 Removing and installing wheel-brake cylinder”, page 65 .

– Test wheel-brake cylinder for tightness ⇒ page 56 .

Replace the wheel-brake cylinder if leaking
⇒ “2.6 Removing and installing wheel-brake cylinder”, page 65 .

– Check if the pistons can be slightly pressed into the wheel-brake cylinder.

If the pistons cannot be slightly pressed into the wheel-brake cylinder:

– Replace the wheel-brake cylinder
⇒ “2.6 Removing and installing wheel-brake cylinder”, page 65 .

2.7.2 Removing and installing brake shoes

Special tools and workshop equipment required

- Hook - 3438-
- Assembly tool - T30114-
- Assembly pliers - T30115-
- Solid lubricant paste - G 000 650-

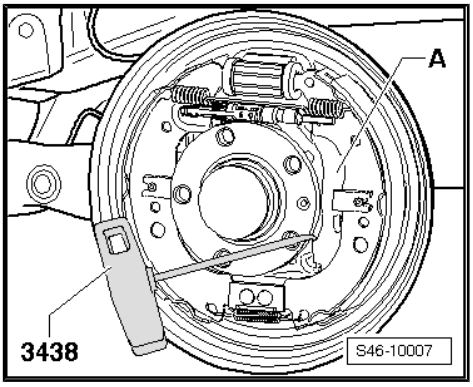
Removing

– Remove wheel.

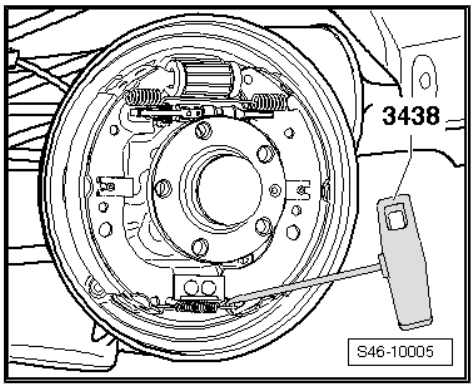
– Resetting brake ⇒ “2.4 Resetting brake”, page 63 .

– Remove the brake drum.

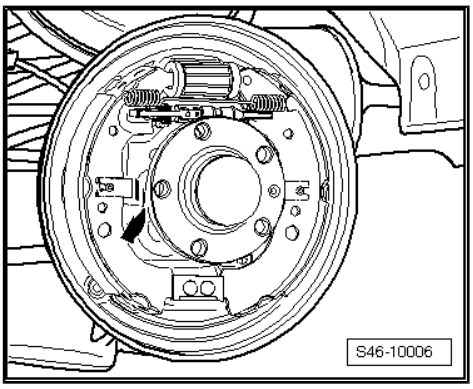
– Put the handbrake lever -A- with the hook - 3438- back into the operating position.



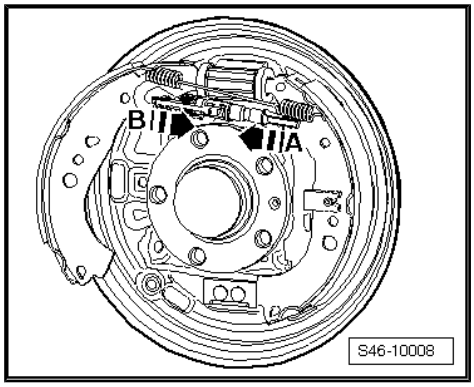
– Remove the bottom retractor spring with the hook - 3438- .



– Remove the securing clamp and the pin of the brake shoe -in direction of arrow- .



– Carefully release the brake shoe and detach the expansion rod in direction of arrow -B- from the brake shoe.



NOTICE

Do not cut through the rubber bowl for the wheel-brake cylinder when handling the brake shoe.

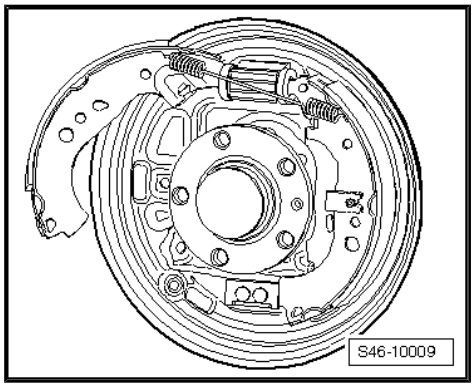
– Detach the expansion rod in direction of arrow -A- from the brake shoe with handbrake lever.

– Remove the top brake spring and the brake shoe.

– Unhook the hand-brake cable.

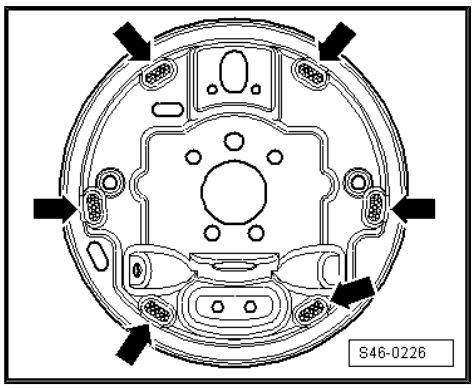
– Remove the securing clamp with the pin of the brake shoe with handbrake lever.

– Remove brake shoe.



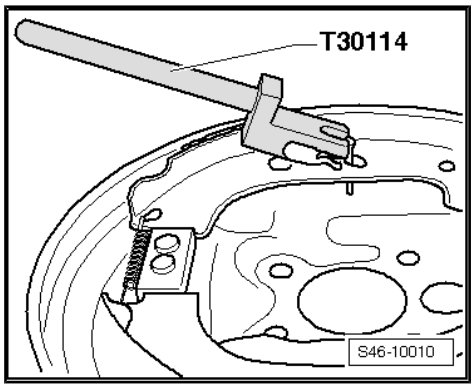
Installing

– Grease contact surfaces -arrows- with solid lubricant paste - G 000 650- .

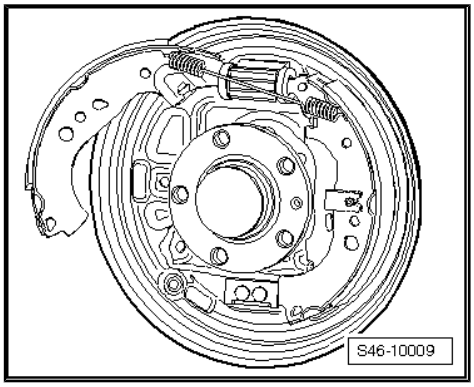


– Insert the brake shoe with handbrake lever and interlock the securing clamp on the pin with the assembly device - T30114- .

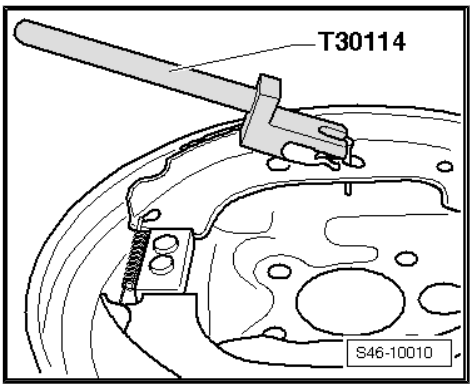
– Note installation position ⇒ page 55 .



– Insert the top brake spring.



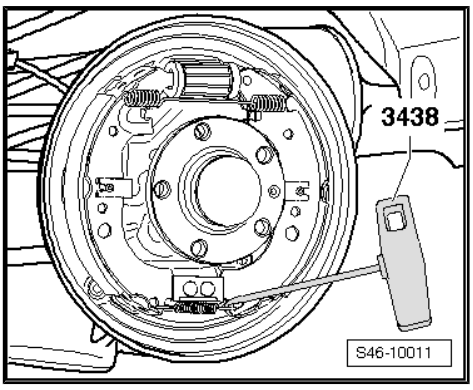
– Insert the pin and the fixing clamp for the brake shoe.



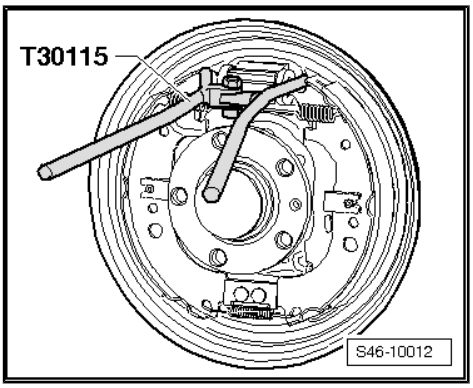
– Hook in the bottom retractor spring with the hook - 3438- .
– Carefully screw the expansion rod to its shortest dimension, do not tighten.

Note

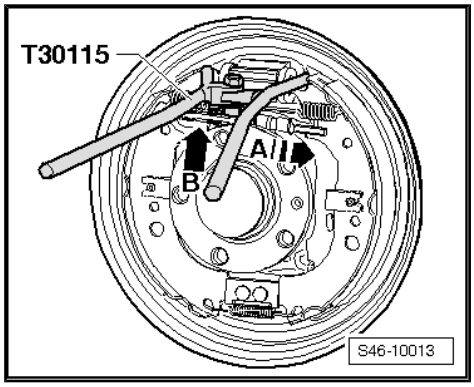
If the expansion rod is tightened too much, the self-adjuster mechanism does no longer operate.



– Pull apart the brake shoes with assembly pliers - T30115- .

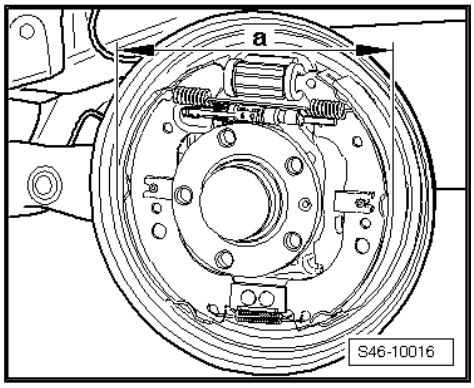


– First of all, position the expansion rod of the self-adjuster in direction of arrow -A- on the brake shoe with handbrake lever.
– Insert the lever for the self-adjuster into the recess of the second brake shoe -arrow B-.
– Note installation position ⇒ page 56 .



– Repeatedly pull apart the brake shoes using the assembly pliers - T30115- , so that the self-adjuster presets the distance from the edges of the brake shoes with lining to the dimension -a-.

a - 227.8 mm



– Clean the centring seat of the wheel hub for the brake drum and subsequently treat it with anti-corrosion agent - AKR 322 000- .
– Clean the centring hole of the brake drum and subsequently treat it with anti-corrosion agent - AKR 322 000- .

Note

The anti-corrosion agent - AKR 322 000- must not get into the threads of the wheel screws!

– Install brake drum.
– Activate the brake pedal forcefully several times, so that the rear brake is adjusted.
– Adjust handbrake
⇒ “3.2 Adjusting parking brake”, page 72 .
– Attach the wheel.

Tightening torques

- ⇒ “2.1.1 Summary of components - rear axle brake, drum brake”, page 52
- Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

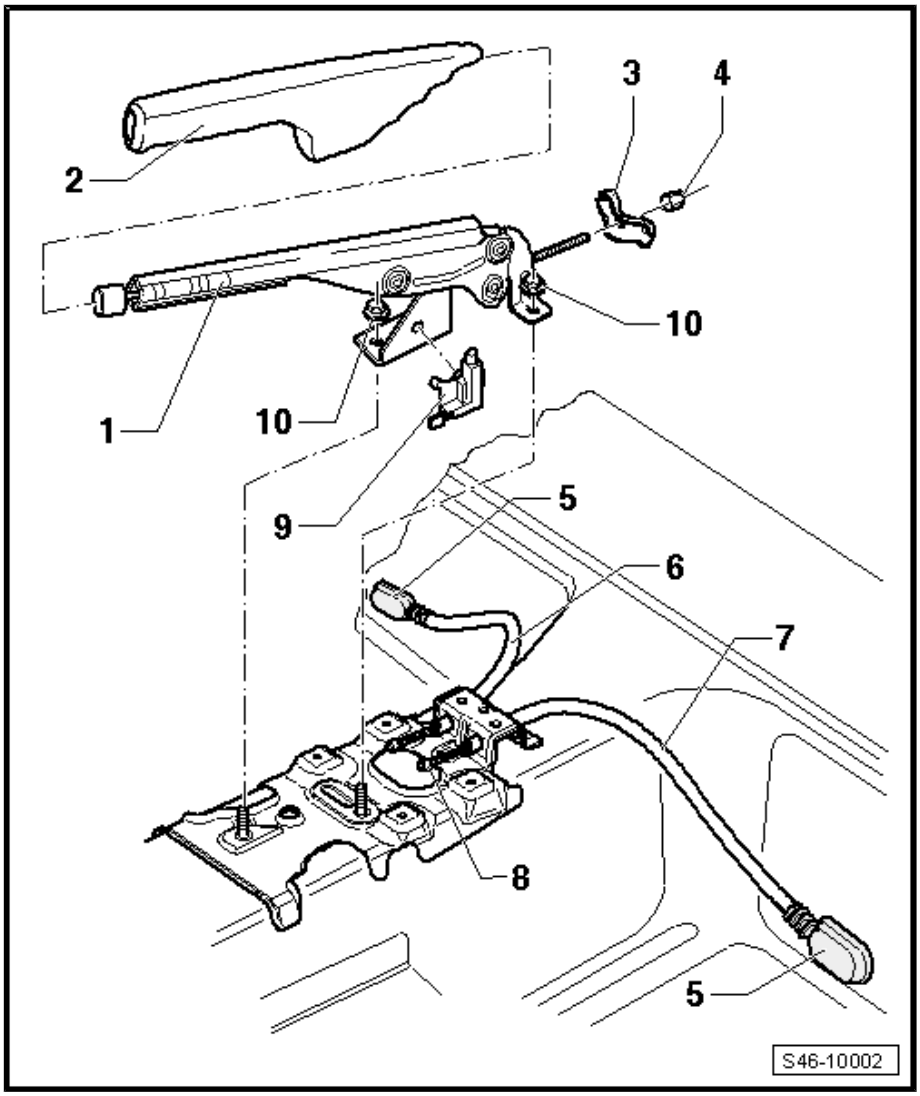
3 Handbrake

⇒ “3.1 Assembly overview - parking brake”, page 71

⇒ “3.2 Adjusting parking brake”, page 72

⇒ “3.3 Removing and installing the rear handbrake cable”, page 74

3.1 Assembly overview - parking brake



1 - Parking brake lever

- ❑ Removing the centre console ⇒ Body Work; Rep. gr. 68
- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

2 - Handbrake handle

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts
- ❑ Removing and installing ⇒ page 72

3 - Compensating clamp

4 - Adjusting nut

- ❑ Adjusting parking brake ⇒ “3.2 Adjusting parking brake”, page 72 .

5 - Grommet

- ❑ removing:
  - – Pull cable out of the guide tube.
  - – Release grommet.
  - – Pull grommet from guide tube.
- ❑ Installing:

  Installation is carried out in the reverse order. After installing make sure the grommet fits correctly in the body recess.

6 - Right guide tube

- ❑ for handbrake cable

7 - Left guide tube

- ❑ for handbrake cable

8 - Hand-brake cable

- ❑ Removing and installing ⇒ “3.3 Removing and installing the rear handbrake cable”, page 74

9 - Handbrake control switch - F9-

- ❑ clipped onto hand-brake lever
- ❑ replace if defective

10 - Nut

- ❑ 23 Nm

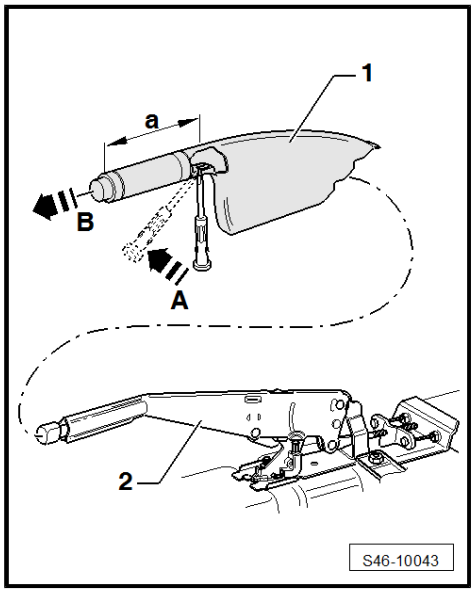
Removing and installing the handbrake lever handle

Removing

– Engage the handbrake lever -2-.

– For example, insert a cross-head screwdriver into the recess of the handle and unlock the securing lock in - direction of arrow A -.

– Push out the handbrake lever handle -1- in -direction of arrow B-.



Note

On vehicles with the leather package, the recess for unlocking the safety bar must be at a clearance -a- 97 mm from the front face of the handle. The position is covered, which means that a thin scriber must be used to unlock it through which the bar must be unlocked in the same way after piercing the leather, as is the case in vehicles with a classic handle.

Installing

– Fit the handle for handbrake lever to the parking brake lever and press until the securing clip engages.

3.2 Adjusting parking brake

⇒ "3.2.1 Adjusting the handbrake – disc brake", page 72

⇒ "3.2.2 Adjusting the handbrake – drum brake", page 73

3.2.1 Adjusting the handbrake – disc brake

Note

- *There is no need to adjust the handbrake due to automatic adjustment of the rear brake.*
- *Resetting is only required after replacing the handbrake cable, the brake carrier or after replacing the brake discs.*

– Remove storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .

– Release hand-brake (hand brake lever in rest position).

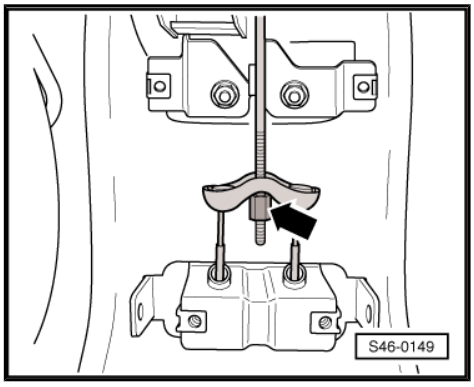
– Forcefully apply the foot brake at least three times.

– Pull the handbrake on and release it three times.

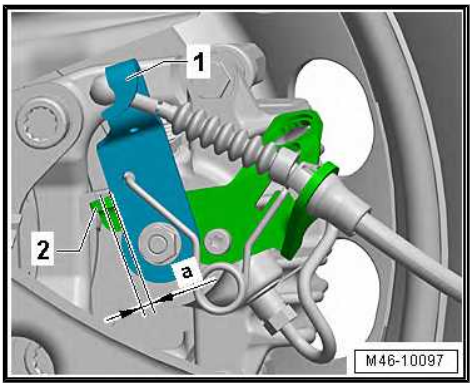
This sets the components into position.

– Release handbrake lever.

– Tighten adjusting nut -arrow-, …



– … until the lever -1- rises and is no longer in contact -2- with the brake calipers.



Note

The adjusting nut arrow -A- must be screwed over the end of the tension rod (self-locking effect).

– The distance -a- to the stop -2- on the left and right brake caliper must together not exceed 1.5 mm.
– Engage and release the handbrake, and check that both wheels spin freely; if necessary, turn back the adjustment nut slightly.
– Install storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .

3.2.2 Adjusting the handbrake – drum brake

Note

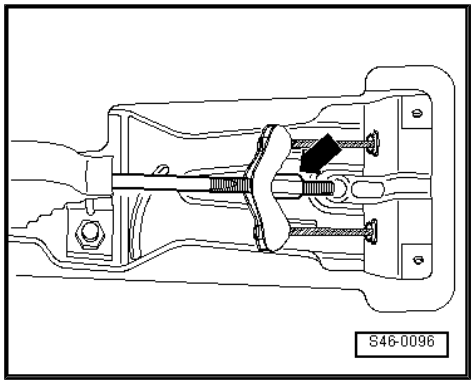
- *Resetting of the hand-brake is not required after resetting of the rear brake due to automatic resetting of the rear wheel-brake.*
- *Resetting is required after replacing the hand-brake cable, the brake carrier or the brake pads/brake shoes or brake drum.*

– Remove storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .
– Release hand-brake (hand brake lever in rest position).
– Forcefully apply the foot brake at least three times.
– Pull the handbrake on and release it three times.

  This sets the components into position.

– Put the hand-brake lever into the 1st catch position (after being in the release position).

– Tighten adjusting nut -arrow- until both wheels are hard to turn by hand.



Note

The adjusting nut arrow -A- must be screwed over the end of the tension rod (self-locking effect).

– Release hand-brake and check whether both wheels rotate freely, if necessary release adjusting nut slightly.
– Put the hand-brake lever into the 4th catch position (after being in the release position).

  No wheel should be rotatable; tighten the adjusting nut if necessary.
– Release hand-brake and check whether both wheels rotate freely, if necessary release adjusting nut slightly.
– Put the hand-brake lever into the 1st catch position and release the hand-brake.

  The hand brake must automatically return to the release position below the 1st catch.
– Install storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .

3.3 Removing and installing the rear handbrake cable

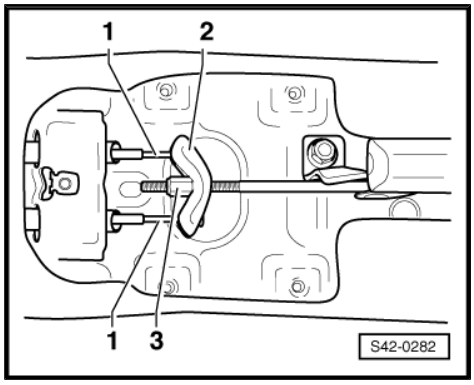
⇒ “3.3.1 Removing and installing the rear handbrake cable, disc brake”, page 74

⇒ “3.3.2 Removing and installing the rear handbrake cable, drum brake”, page 76

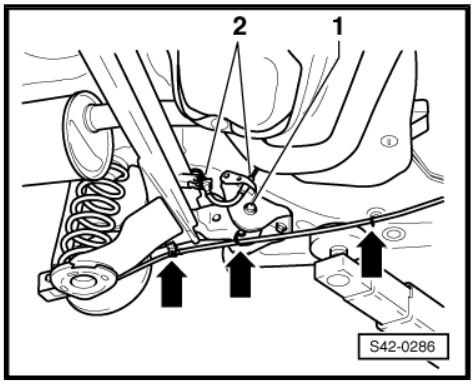
3.3.1 Removing and installing the rear handbrake cable, disc brake

Removing

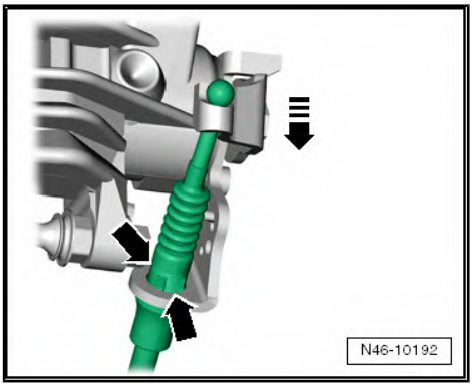
– Put hand-brake back.
– Remove storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .
– Release resetting nut -3- and unhook hand-brake cables -1- from compensating clamp -2-.
– Remove wheel.
– Raise vehicle.



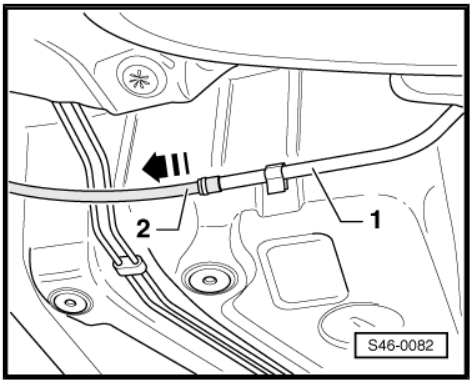
– Unclip the hand-brake cable out of the clips on the axle body and body -arrows-.



– Push the handbrake lever in the -direction of the arrow- and unhook the hand-brake cable.
– Release the two retaining tabs -arrows- and undo the spring bushing for the handbrake cable from the holder on the brake calliper.



– Pull hand-brake cable -2- (in -direction of arrow-) out of the guide tube -1-.



Installing

Installation is carried out in the reverse order.

Note

When installing the hand brake cables, pay attention to the fitting position.

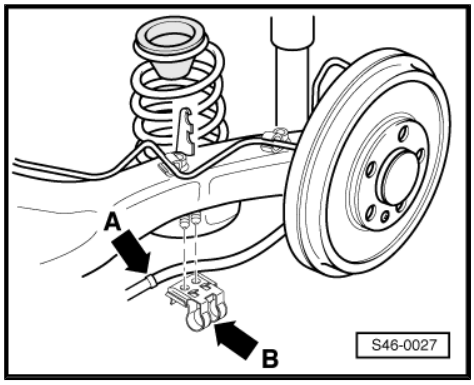
Fitting position of the hand-brake cables

Note

Fitting position of the hand-brake cables is identical on vehicles with drum or disc brake (only version with drum brake is shown).

– The hand-brake cables must be clipped in.

– The clamping ring -arrow A- at the hand-brake cable must rest in the centre of the clip -arrow B-.



Note

Before setting the handbrake, slightly pretension the handbrake cable with the adjustment nut on the compensator.

– Adjusting parking brake
⇒ “3.2 Adjusting parking brake”, page 72 .

Tightening torques

♦ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

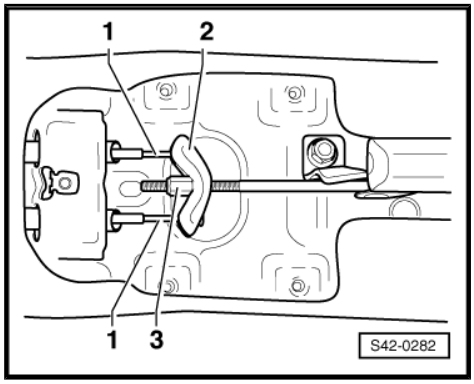
3.3.2 Removing and installing the rear hand-brake cable, drum brake

Removing

– Put hand-brake back.

– Remove storage compartment or arm rest ⇒ Body Work; Rep. gr. 68 .

– Release resetting nut -3- and unhook hand-brake cables -1- from compensating clamp -2-.



– Remove wheel.

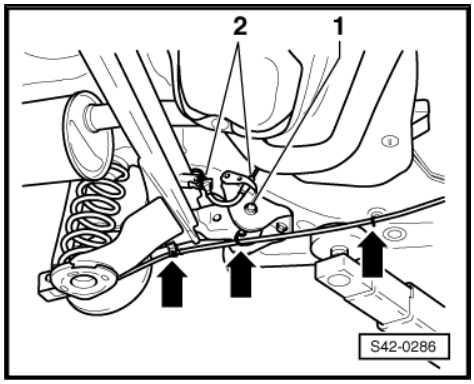
– Raise vehicle.

– Unclip the hand-brake cable out of the clips on the axle body and body -arrows-.

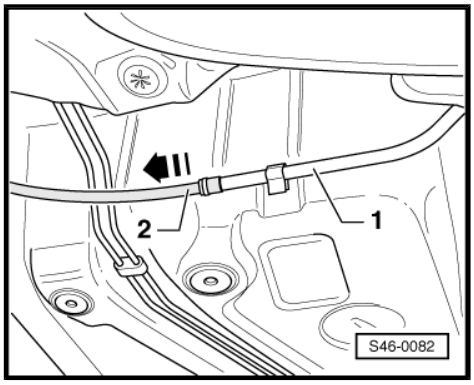
– Remove the brake drum.

– Unhook the hand-brake cable at the hand-brake lever.

– Pull hand-brake cable out of brake carrier.



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



Installing

Installation is carried out in the reverse order.

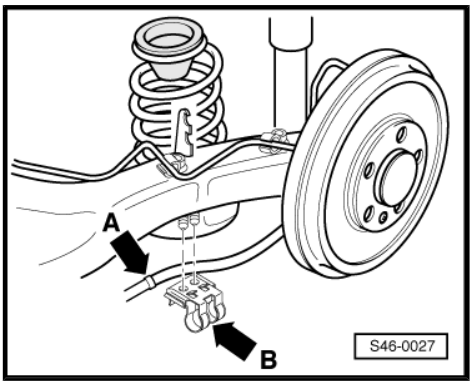
Note

When installing the hand brake cables, pay attention to the fitting position.

Fitting position of the hand-brake cables

– The hand-brake cables must be clipped in.

– The clamping ring -arrow A- at the hand-brake cable must rest in the centre of the clip -arrow B-.



Note

Before setting the hand-brake, slightly pretension the hand-brake cable with the adjusting nut at the compensation clamp.

– Adjusting parking brake
⇒ “3.2 Adjusting parking brake”, page 72 .

Tightening torques

♦ Wheel bots ⇒ Wheels, tyres; Rep. gr. 44

4 Brake pedal

⇒ “4.1 Assembly overview - brake pedal”, page 78

⇒ “4.2 Removing and installing bearing bracket”, page 84

⇒ “4.3 Separating brake pedal from brake servo”, page 87

⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88

⇒ “4.5 Removing and installing brake pedal”, page 88

4.1 Assembly overview - brake pedal

⇒ “4.1.1 Summary of components - brake pedal, left-hand drive vehicles up to 10/2013”, page 78

⇒ “4.1.2 Summary of components - brake pedal, left-hand drive vehicles from 11/2013”, page 79

⇒ “4.1.3 Summary of components - brake pedal, right-hand drive vehicles up to 10/2013”, page 81

⇒ “4.1.4 Summary of components - brake pedal, right-hand drive vehicles from 11/2013”, page 82

4.1.1 Summary of components - brake pedal, left-hand drive vehicles up to 10/2013

WARNING

The travel of the brake pedal must not be shortened by additional foot mats.

Note

- *Grease all bearing surfaces with polycarbamide grease - G 052 142 A2- before assembly.*
- *Do not grease the bearing bolt. The bearing bolt must remain dry.*
- *The brake light switch - F- and brake pedal switch - F47- are located on the master brake cylinder.*

1 - Bearing bracket

- ❑ for foot controls
- ❑ Removing and installing ⇒ “4.2.1 Removing and installing bearing bracket, left-hand drive vehicles from 10/2013”, page 84

2 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

3 - Bushing

4 - Brake pedal

- ❑ Removing and installing ⇒ “4.5.1 Removing and installing brake pedal, left-hand drive vehicles up to 10/2013”, page 88

5 - Cap

6 - Bearing shell

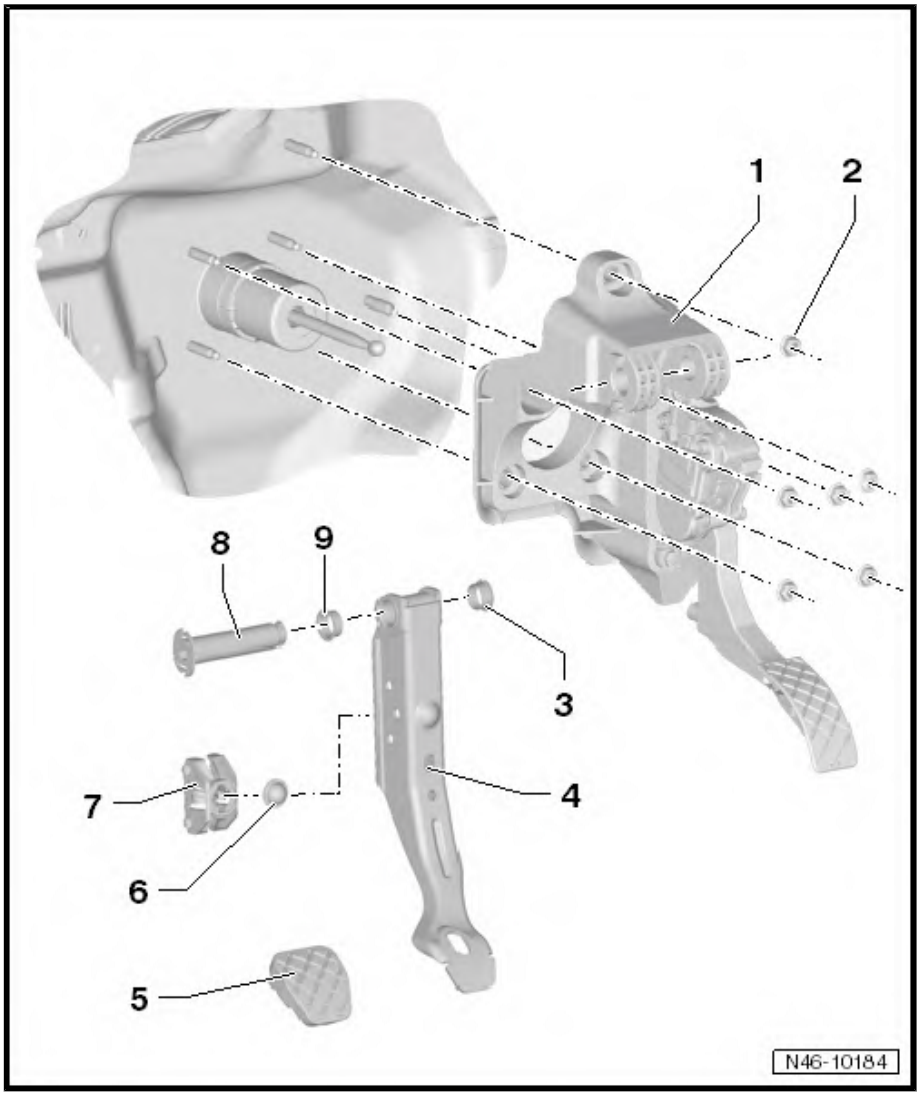
7 - Retaining clip

- ❑ for the spherical head of the brake servo push rod

8 - Bearing shaft

- ❑ must only be fitted once, because the tabs break off when removing

9 - Bushing



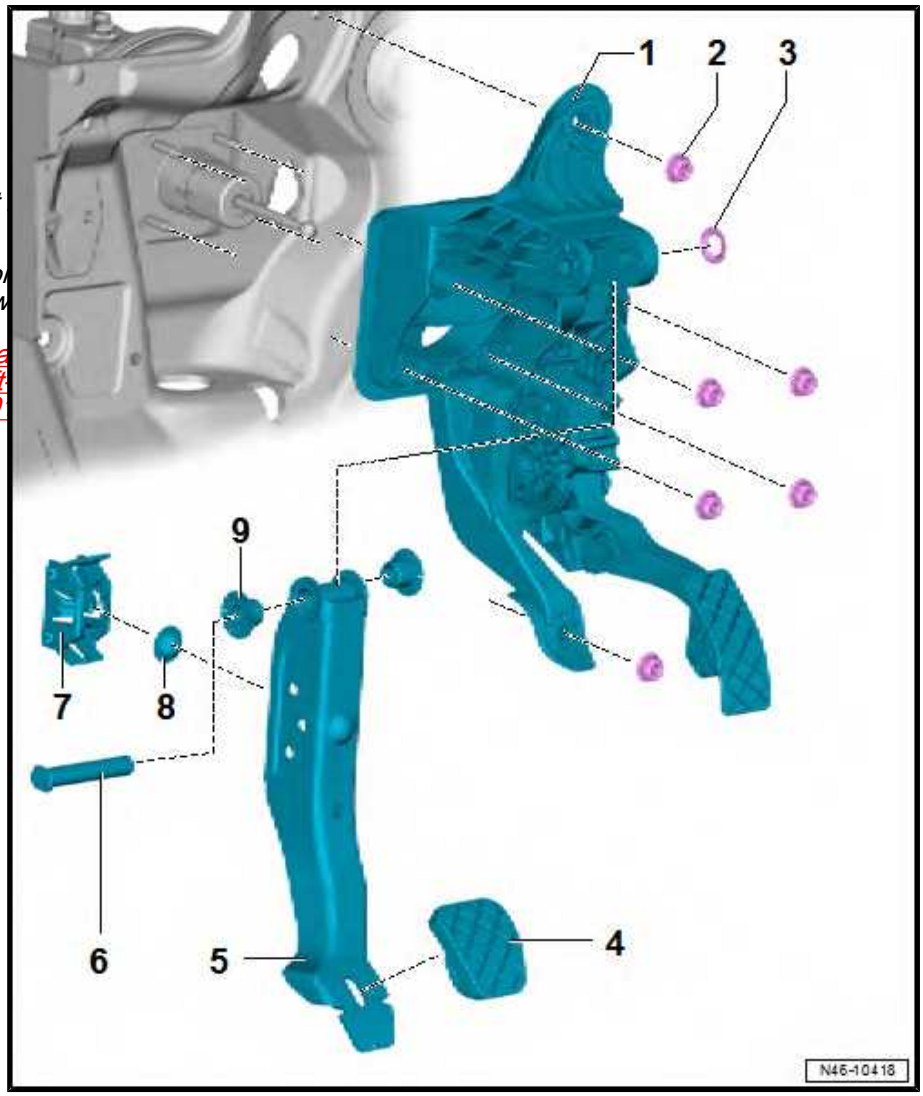
4.1.2 Summary of components - brake pedal, left-hand drive vehicles from 11/2013

WARNING

The travel of the brake pedal must not be shortened by additional foot mats.

Note

- *Grease all bearing surfaces with polycarbamide grease - G 052 142 A2- before assembly.*
- *Do not grease the bearing bolt. The bearing bolt must remain dry.*
- *The brake light switch - F- and brake pedal switch - F47- are located on the master brake cylinder.*



1 - Bearing bracket

- ❑ with brake and accelerator pedal

Note

- *Brake pedal cannot individually.*
- *Turbocharger can o placed completely w manifold ⇒ "4.2.2 Removing a bearing bracket, left vehicles from 11/20 page 84 .*

- ❑ Separating brake pedal from brake servo ⇒ "4.3 Separating brake pedal from brake servo", page 87
- ❑ Clipping the brake pedal onto the brake servo ⇒ "4.4 Clipping the brake pedal onto the brake servo unit", page 88
- ❑ Removing and installing ⇒ "4.2.2 Removing and installing bearing bracket, left-hand drive vehicles from 11/2013", page 84

2 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

3 - Fixing clamp

- ❑ not replaceable individually

4 - Cap

5 - Brake pedal

Note

- *Brake pedal cannot be replaced individually.*

- ♦ *Turbocharger can only be replaced completely with exhaust manifold*
  ⇒ “4.2.2 Removing and installing bearing bracket, left-hand drive vehicles from 11/2013”, page 84 .

❑ Separating brake pedal from brake servo ⇒ “4.3 Separating brake pedal from brake servo”, page 87
❑ Clipping the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88

6 - Bearing shaft

❑ not replaceable individually

7 - Retaining clip

❑ for the spherical head of the brake servo push rod
❑ Separating brake pedal from brake servo ⇒ “4.3 Separating brake pedal from brake servo”, page 87
❑ Clipping the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88

8 - Bearing shell

9 - Bushing

4.1.3 Summary of components - brake pedal, right-hand drive vehicles up to 10/2013

WARNING

The travel of the brake pedal must not be shortened by additional foot mats.

Note

- *Grease all bearing surfaces with polycarbamide grease - G 052 142 A2- before assembly.*
- *Do not grease the bearing bolt. The bearing bolt must remain dry.*
- *The brake light switch - F- and brake pedal switch - F47- are located on the master brake cylinder.*

1 - Screw

2 - Bushing

3 - Brake pedal

- ❑ Removing and installing ⇒ "4.5.2 Removing and installing brake pedal, right-hand drive vehicles up to 10/2013", page 89

4 - Bearing bracket

- ❑ for foot controls
- ❑ Removing and installing ⇒ "4.2.3 Removing and installing bearing bracket, right-hand drive vehicles up to 10/2013", page 85

5 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

6 - Nut

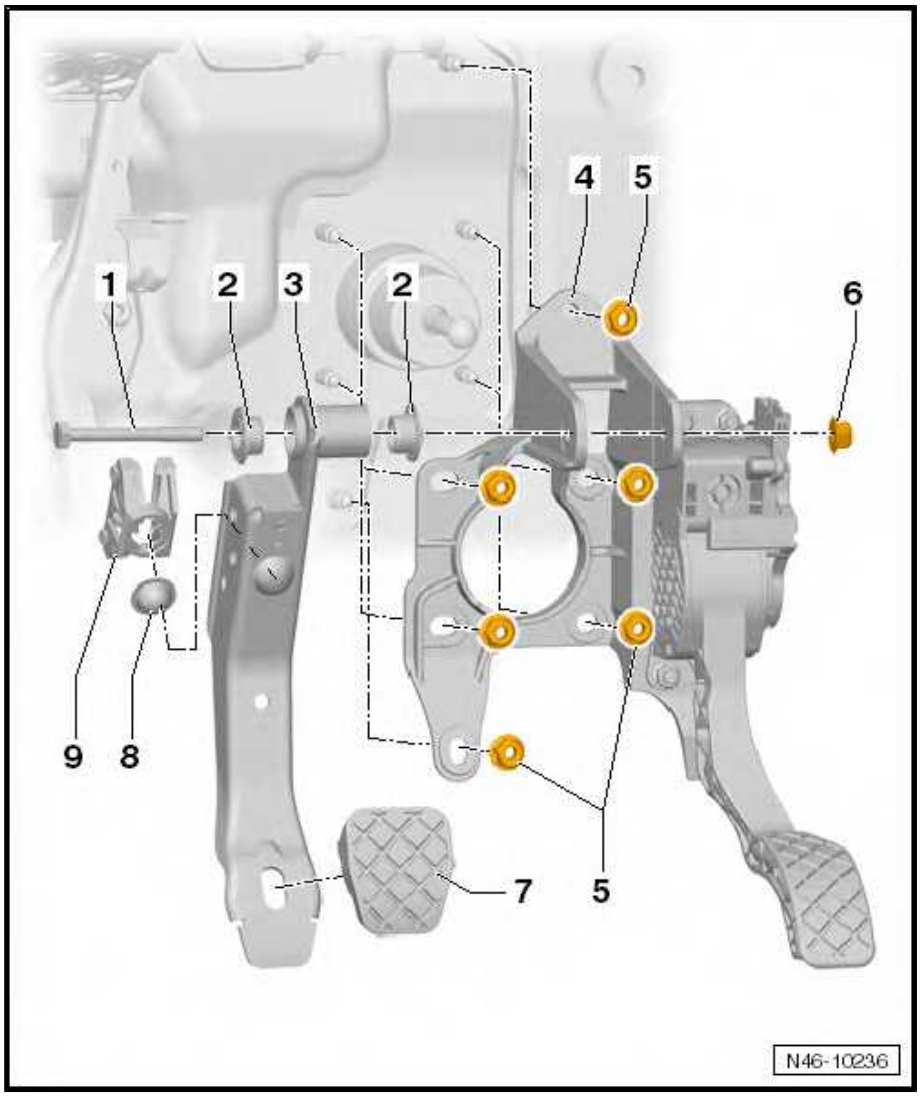
- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

7 - Cap

8 - Bearing shell

9 - Retaining clip

- ❑ for the spherical head of the brake servo push rod



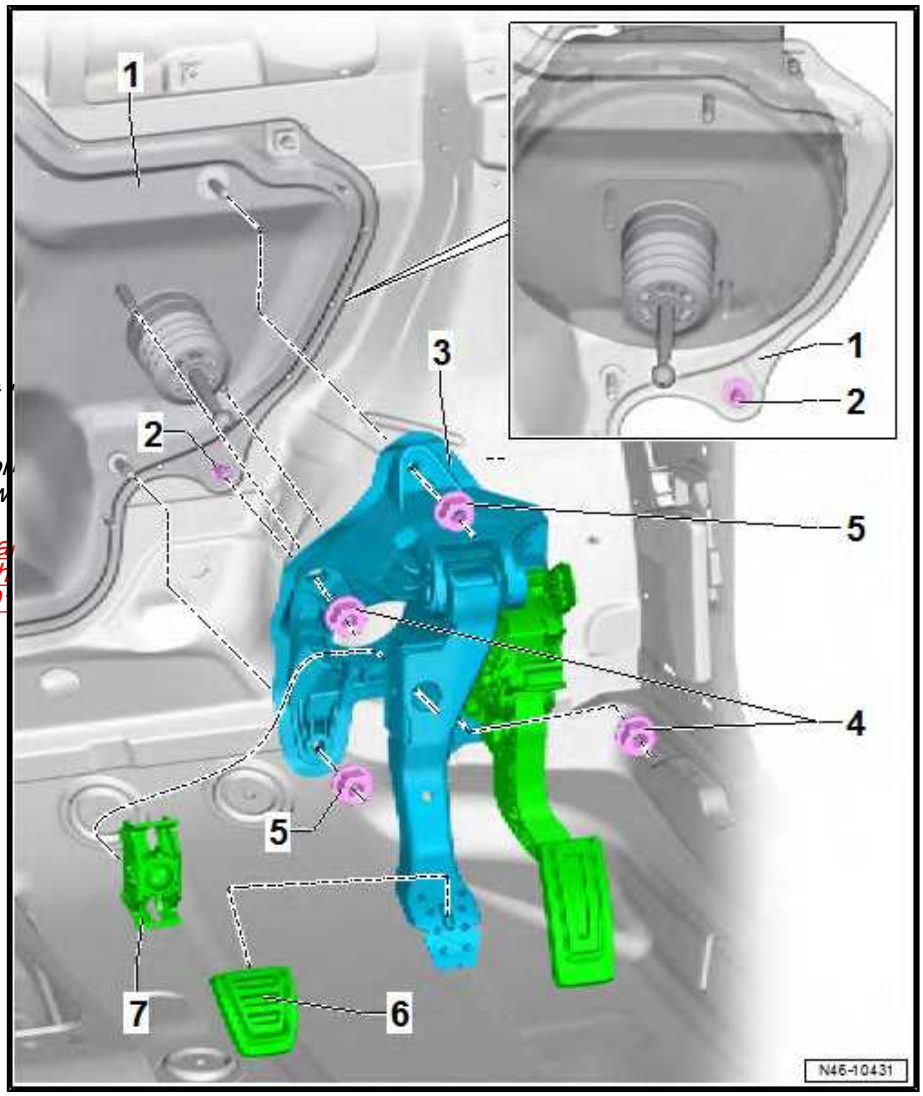
4.1.4 Summary of components - brake pedal, right-hand drive vehicles from 11/2013

WARNING

The travel of the brake pedal must not be shortened by additional foot mats.

Note

- *Grease all bearing surfaces with polycarbamide grease - G 052 142 A2- before assembly.*
- *Do not grease the bearing bolt. The bearing bolt must remain dry.*
- *The brake light switch - F- and brake pedal switch - F47- are located on the master brake cylinder.*



1 - Partition panel

2 - Screw

- ❑ remove from engine compartment
- ❑ 20 Nm

3 - Bearing bracket

- ❑ with brake and accelerator pedal

Note

- *Brake pedal cannot individually.*
- *Turbocharger can o placed completely w manifold*
  ⇒ "4.2.4 Removing a bearing bracket, righ vehicles from 11/20 page 86 .

- ❑ Separating brake pedal from brake servo ⇒ "4.3 Separating brake pedal from brake servo", page 87
- ❑ Clipping the brake pedal onto the brake servo ⇒ "4.4 Clipping the brake pedal onto the brake servo unit", page 88
- ❑ Removing and installing ⇒ "4.2.4 Removing and installing bearing bracket, right-hand drive vehicles from 11/2013", page 86

4 - Nut

- ❑ self-locking
- ❑ 25 Nm

5 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

6 - Cap

7 - Retaining clip

- ❑ for the spherical head of the brake servo push rod
- ❑ Separating brake pedal from brake servo ⇒ "4.3 Separating brake pedal from brake servo", page 87

❑ Clipping the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88

4.2 Removing and installing bearing bracket

⇒ “4.2.1 Removing and installing bearing bracket, left-hand drive vehicles from 10/2013”, page 84

⇒ “4.2.2 Removing and installing bearing bracket, left-hand drive vehicles from 11/2013”, page 84

⇒ “4.2.3 Removing and installing bearing bracket, right-hand drive vehicles up to 10/2013”, page 85

⇒ “4.2.4 Removing and installing bearing bracket, right-hand drive vehicles from 11/2013”, page 86

4.2.1 Removing and installing bearing bracket, left-hand drive vehicles from 10/2013

Removing

– Removing the left footwell vent ⇒ Heating, Air Conditioning; Rep. gr. 87 .

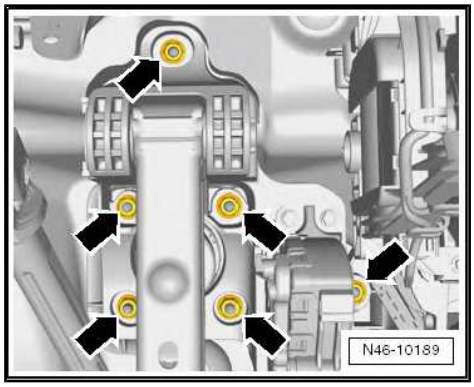
– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

– Disconnect the plug connection from the accelerator pedal position sender.

– Remove gas pedal ⇒ Engine; Rep. gr. 20 .

– Remove the nuts -arrows- for the bearing bracket.

– Remove bracket.



Installing

Installation is carried out in the reverse order.

Tightening torques

◆ ⇒ “4.1.1 Summary of components - brake pedal, left-hand drive vehicles up to 10/2013”, page 78

4.2.2 Removing and installing bearing bracket, left-hand drive vehicles from 11/2013

Removing

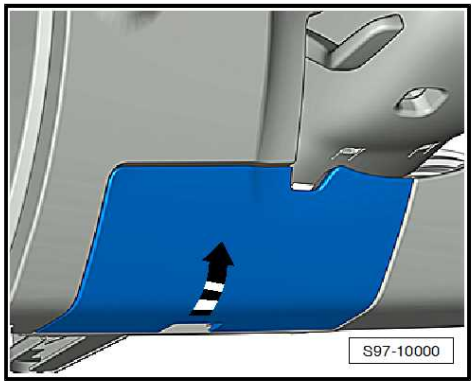
– Remove brake servo unit ⇒ “3.6 Removing and installing brake servo”, page 114 .

– Remove cover of fuse box in -direction of arrow-.

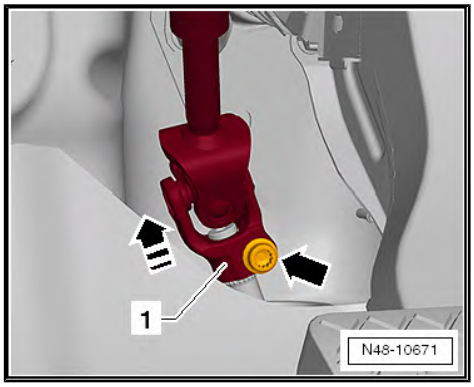
– Unscrew screws for fuse box and place box to one side ⇒ Electrical System; Rep. gr. 97 .

– Disconnect the plug connection from the accelerator pedal position sender.

– Remove gas pedal ⇒ Engine; Rep. gr. 20 .



– Unscrew bolt -arrow- and detach universal joint -1- (in -direction of arrow-) from the input shaft of the power-steering gear.
– Place universal joint with steering column to one side.



– Remove the nuts -arrows- from the bearing bracket.
– Remove foot controls.

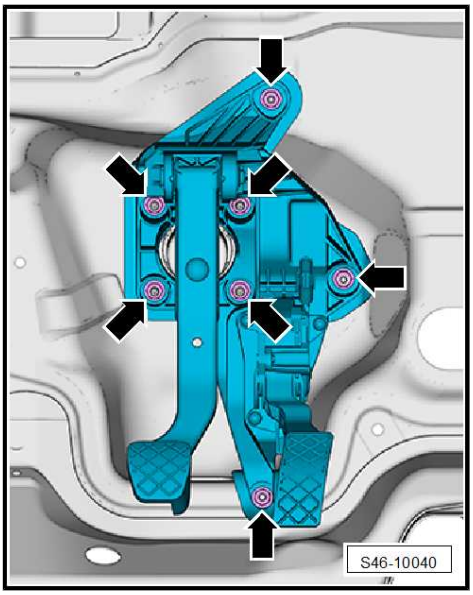
Installing

Installation is carried out in the reverse order; pay attention to the following points:

– Clipping the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88

Tightening torques

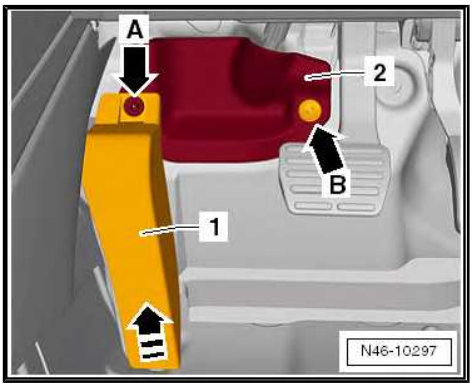
- ⇒ “4.1.2 Summary of components - brake pedal, left-hand drive vehicles from 11/2013”, page 79
- Accelerator pedal ⇒ Engine; Rep. gr. 20
- Footwell vent ⇒ Heating, Air Conditioning; Rep. gr. 87



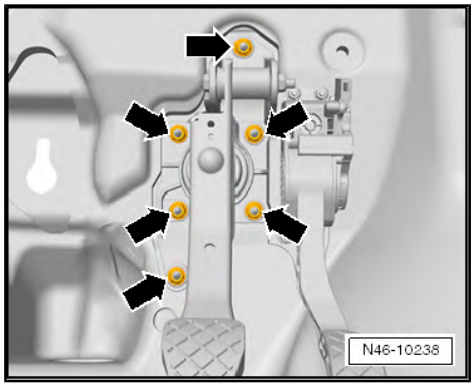
4.2.3 Removing and installing bearing bracket, right-hand drive vehicles up to 10/2013

Removing

– Remove right footwell vent ⇒ Heating, Air Conditioning; Rep. gr. 80 .
– Disconnect the plug connection from the accelerator pedal position sender.
– Unscrews nuts -arrow A- and -arrow B-.
– Remove the foot rest -1- and the steering column trim panel -2-.
– Separating the brake pedal from the brake servo unit
⇒ “4.3 Separating brake pedal from brake servo”, page 87 .



– Remove the nuts -arrows- for the bearing bracket.
– Remove bracket.



Installing

Installation is carried out in the reverse order.

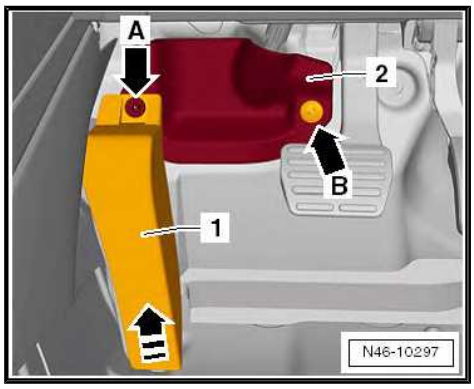
Tightening torques

◆ ⇒ “4.1.3 Summary of components - brake pedal, right-hand drive vehicles up to 10/2013”, page 81

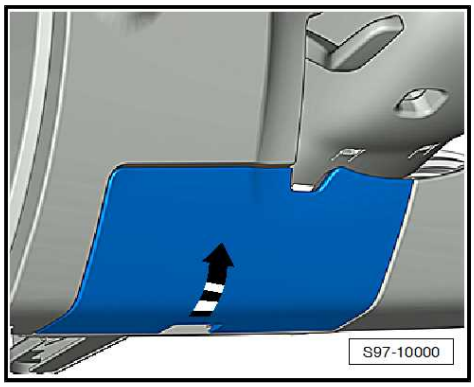
4.2.4 Removing and installing bearing bracket, right-hand drive vehicles from 11/2013

Removing

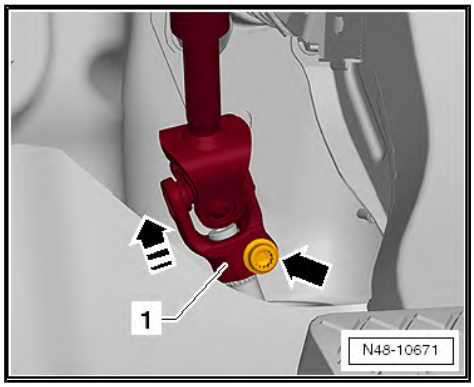
– Unscrews nuts -arrow A- and -arrow B-.
– Remove the foot rest -1- and the steering column trim panel -2-.
– Removing the left footwell vent on the driver side ⇒ Heating, Air Conditioning; Rep. gr. 87 .



– Remove cover of fuse box in -direction of arrow-.
– Unscrew screws for fuse box and place box to one side ⇒ Electrical System; Rep. gr. 97 .
– Disconnect the plug connection from the accelerator pedal position sender.
– Remove gas pedal ⇒ Engine; Rep. gr. 20 .
– Remove brake servo unit ⇒ “3.6 Removing and installing brake servo”, page 114 .



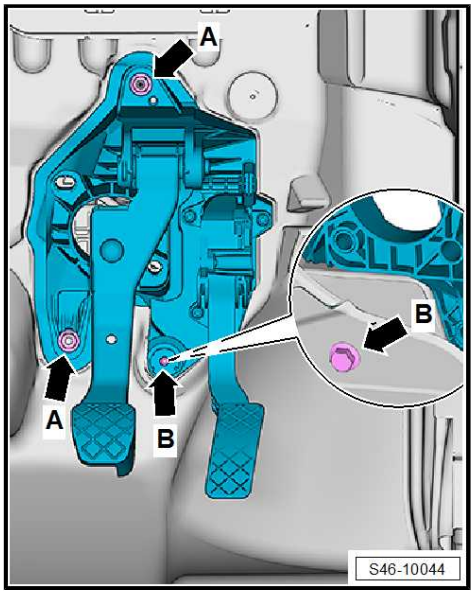
– Unscrew bolt -arrow- and detach universal joint -1- (in -direction of arrow-) from the input shaft of the power-steering gear.
– Place universal joint with steering column to one side.



– Remove the nuts arrows -A- for the bearing bracket.

– Remove the screw -arrow B-, which secures the foot controls from the engine compartment.

– Remove foot controls.



Installing

Installation is carried out in the reverse order; pay attention to the following points:

– Clipping the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88

Tightening torques

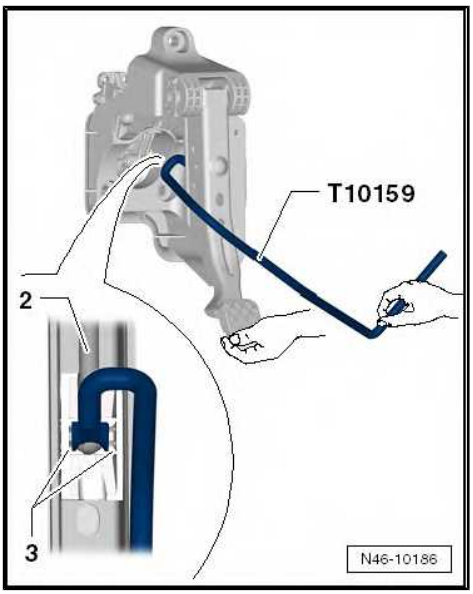
- ⇒ “4.1.4 Summary of components - brake pedal, right-hand drive vehicles from 11/2013”, page 82
- Accelerator pedal ⇒ Engine; Rep. gr. 20
- Footwell vent ⇒ Heating, Air Conditioning; Rep. gr. 87

4.3 Separating brake pedal from brake servo

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-

– Press the brake pedal towards the brake servo unit and hold it in position.



2 - Plunger rod

3 - Retaining lugs

– Insert release tool - T10159A- or -T10159B- and pull it in the direction of the driver's seat while counterholding the brake pedal (the pedal must not move backwards during this operation). This pushes the retaining lugs -3- of the mount off the ball head of the push rod -2-.

The fig. shows the separation of the brake pedal from the brake servo unit with the foot controls removed for clarity.

– Pull release tool - T10159A- or -T10159B- and brake pedal together towards the driver's seat. (This causes the brake pedal to be drawn off the ball head of the push rod).

4.4 Clipping the brake pedal onto the brake servo unit

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

– Check that it is correctly locked in place by briefly pulling on the brake pedal.

4.5 Removing and installing brake pedal

⇒ “4.5.1 Removing and installing brake pedal, left-hand drive vehicles up to 10/2013”, page 88

⇒ “4.5.2 Removing and installing brake pedal, right-hand drive vehicles up to 10/2013”, page 89

4.5.1 Removing and installing brake pedal, left-hand drive vehicles up to 10/2013

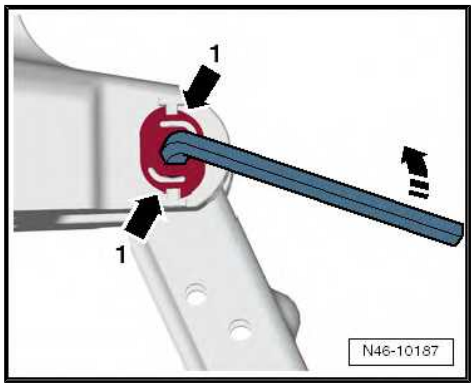
Removing

– Removing bracket
⇒ “4.2.1 Removing and installing bearing bracket, left-hand drive vehicles from 10/2013”, page 84 .

– Turn the bearing axle to the left in -direction of arrow- using a 10 mm socket wrench, while doing so the tabs break off -arrows 1-.

– Pull out bearing bolt.

– Remove brake pedal.



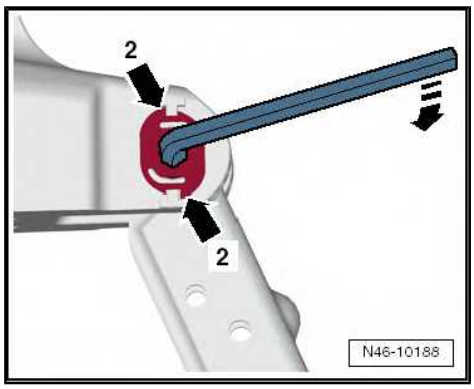
Installing

Installation is performed in the reverse order; pay attention to the following points:

– Insert the bearing axle and turn clockwise in -direction of arrow- using a 10 mm socket wrench until the tabs -arrows 2- rest against the stop.

– Installing bracket
⇒ “4.2.1 Removing and installing bearing bracket, left-hand drive vehicles from 10/2013”, page 84 .

– Clip the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .



4.5.2 Removing and installing brake pedal, right-hand drive vehicles up to 10/2013

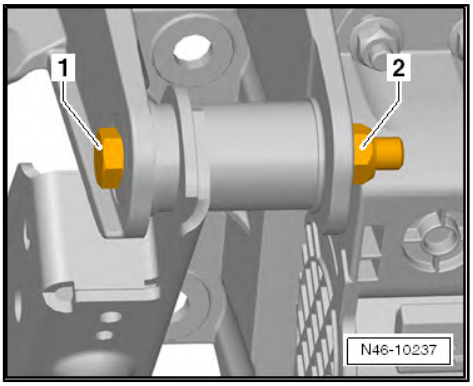
Removing

– Removing bracket
⇒ “4.2.3 Removing and installing bearing bracket, right-hand drive vehicles up to 10/2013”, page 85 .

– Remove nut - 2 -.

– Release screw -1-.

– Remove brake pedal.



Installing

Installation is performed in the reverse order; pay attention to the following points:

– Installing bracket
⇒ “4.2.3 Removing and installing bearing bracket, right-hand drive vehicles up to 10/2013”, page 85 .

– Clip the brake pedal onto the brake servo
⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

47 – Brakes - hydraulics

1 Front brake calipers

⇒ “1.1 Summary of components - front brake caliper”, page 90

⇒ “1.2 Removing and installing brake caliper piston”, page 93

1.1 Summary of components - front brake caliper

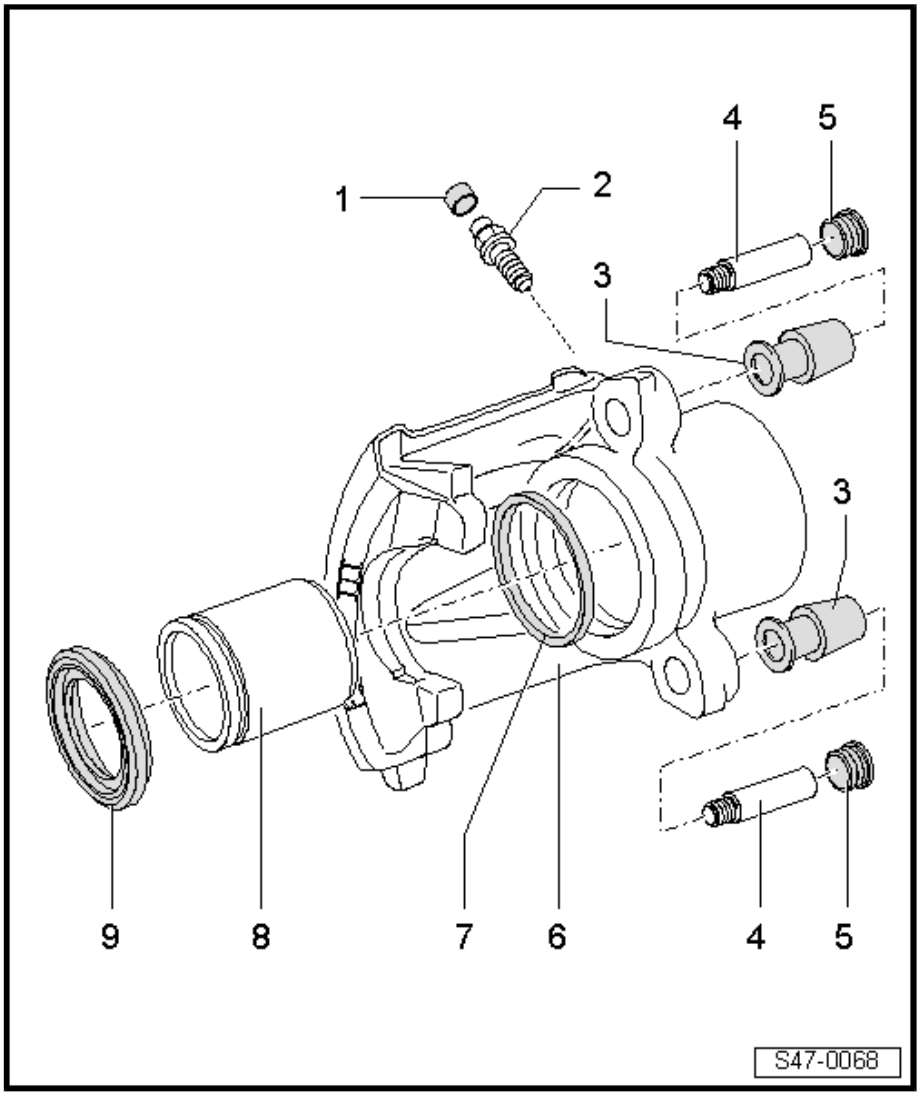
⇒ “1.1.1 Exploded view – front brake caliper - brake FS III”, page 90

⇒ “1.1.2 Exploded view – front brake caliper - brake FN3”, page 92

1.1.1 Exploded view – front brake caliper - brake FS III

Note

- *Install the complete repair set when undertaking repairs.*
- *Use only methylated spirit for cleaning.*
- *Thinly coat brake cylinder, piston and gasket ring with lithium grease - G 052 150 A2- .*



1 - Dust cap

- ❑ place on the vent valve

2 - Vent valve

- ❑ thinly coat thread with lithium grease - G 052 150 A2- before screwing in
- ❑ 10 Nm

3 - Bushing

- ❑ insert into the brake caliper housing

4 - Guide bolt

- ❑ Tightening torque ⇒ “1.1.1 Summary of components - front brake FS-III”, page 38

5 - Cover caps

- ❑ insert in bushing

6 - Brake caliper

- ❑ Removing and installing ⇒ “1.3.1 Removing and installing brake caliper FS-III”, page 46

7 - Sealing ring

- ❑ Removing and installing ⇒ “1.2.1 Removing and installing brake caliper piston of front FS-III brake”, page 93
- ❑ before installing, thinly coat piston with lithium grease - G 052 150 A2-

8 - Piston

- ❑ Removing and installing ⇒ “1.2.1 Removing and installing brake caliper piston of front FS-III brake”, page 93
- ❑ before installing, thinly coat piston with lithium grease - G 052 150 A2-

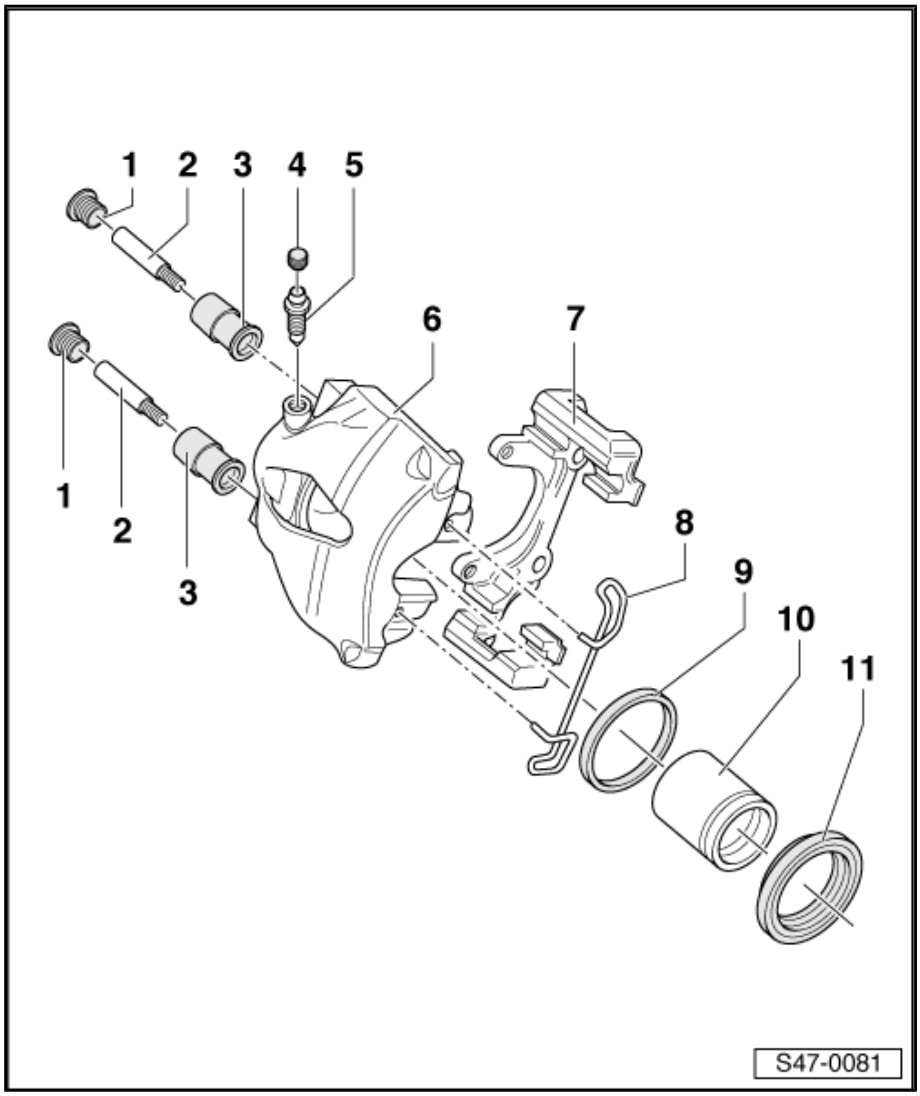
9 - Collar

- ❑ Removing and installing ⇒ “1.2.1 Removing and installing brake caliper piston of front FS-III brake”, page 93
- ❑ do not damage when inserting the piston

1.1.2 Exploded view – front brake caliper - brake FN3

Note

- *Install the complete repair set when undertaking repairs.*
- *Use only methylated spirit for cleaning.*
- *Thinly coat brake cylinder, piston and gasket ring with lithium grease - G 052 150 A2- .*



1 - Cover caps
- ❑ insert in bushing

2 - Guide bolt
- ❑ Tightening torque ⇒ “1.1.2 Summary of components - front brake FN3”, page 40

3 - Bushing
- ❑ insert into the brake caliper housing

4 - Dust cap
- ❑ place on the vent valve

5 - Vent valve
- ❑ thinly coat thread with lithium grease - G 052 150 A2- before screwing in
- ❑ 10 Nm

6 - Brake caliper
- ❑ Removing and installing ⇒ “1.3.2 Removing and installing brake caliper FN3”, page 49

7 - Brake carrier
- ❑ crewed to the brake caliper

8 - Spring
- ❑ insert with both ends into the bores in the brake caliper

9 - Sealing ring
- ❑ Removing and installing ⇒ “1.2.2 Removing and installing piston of brake caliper FN3”, page 94
- ❑ First thinly coat piston with lithium grease - G 052 150 A2-

10 - Piston
- ❑ Removing and installing ⇒ “1.2.2 Removing and installing piston of brake caliper FN3”, page 94
- ❑ First thinly coat piston with lithium grease - G 052 150 A2-

11 - Boot
- ❑ Removing and installing ⇒ “1.2.2 Removing and installing piston of brake caliper FN3”, page 94
- ❑ do not damage when inserting the piston

1.2 Removing and installing brake caliper piston

⇒ “1.2.1 Removing and installing brake caliper piston of front FS-III brake”, page 93

⇒ “1.2.2 Removing and installing piston of brake caliper FN3”, page 94

1.2.1 Removing and installing brake caliper piston of front FS-III brake

Special tools and workshop equipment required

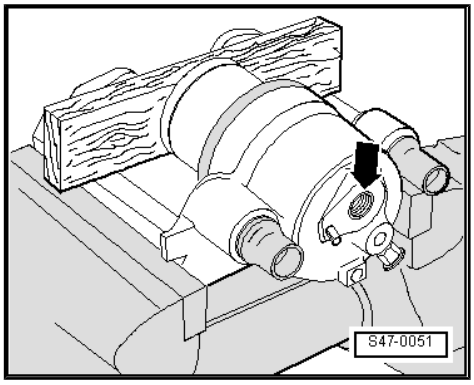
- Piston jig - T10145-
- Plastic wedge - 3409-
- Grease - G 052 150 A2-

Removing

– Remove brake caliper
⇒ “1.3.1 Removing and installing brake caliper FS-III”, page 46 .

– Insert wooden plate to avoid damaging the piston as it is being pressed out.

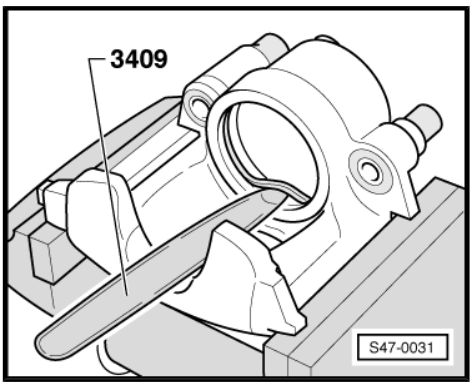
– Press the piston out of the brake caliper housing using compressed air -arrow-.



Note

Make sure that the cylinder surface is not damaged when removing the gasket ring.

– Remove gasket ring with disassembly wedge - 3409- .



Installing

Note

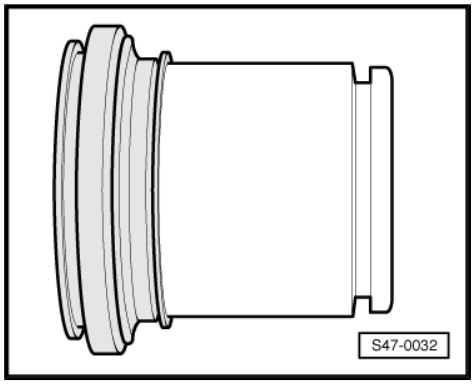
- *Always install the complete repair kit when repairing the brake calliper.*
- *Use only methylated spirits for cleaning the brake.*
- *New brake calipers are filled with brake fluid and are pre-bled.*
- *It is absolutely necessary, if repairs are being undertaken, to pre-bleed the brake calipers before installing them in the vehicle (without brake pads)* ⇒ page 94 .

– Clean piston and gasket ring with white spirits and dry off.

– Before installing the piston and sealing ring in the brake caliper, thinly coat with lithium grease - G 052 150 A2- .

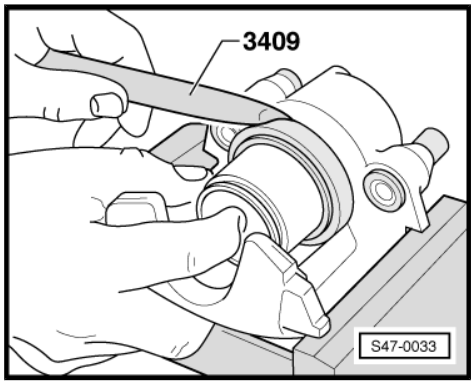
– Insert new gasket ring in the groove of the brake caliper.

– Position the protective cap with the outer sealing lip on the piston.



– Insert inner sealing lip of the protective cap with disassembly wedge - 3409- in the groove of the cylinder.

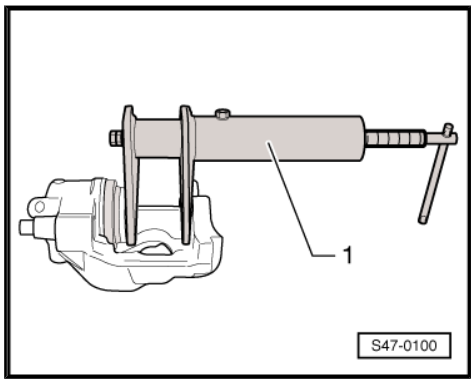
  To do so hold the piston with the hand.



– Press the piston with the piston jig - T10145- -1- into the brake caliper.

The outer sealing lip of the protective cap will clip into the piston groove.

Pre-bleeding the brake caliper

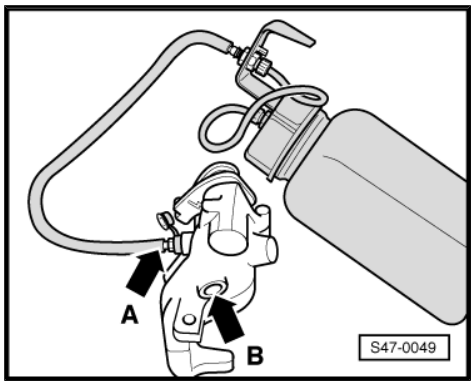


Set up brake caliper for pre-bleeding as shown in the fig.

– Open vent valve -arrow A-.

– Using a commercially available ventilation reservoir pour in brake fluid until bubble-free brake fluid drips out of the threaded bore (brake hose connection) -arrow B-.

– Close vent valve.



1.2.2 Removing and installing piston of brake caliper FN3

Special tools and workshop equipment required

- Disassembly wedge - 3409-
- Piston jig - T10145-
- Assembly tool - T10146/6-

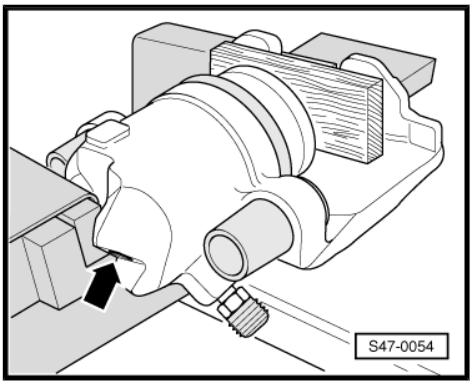
♦ Grease - G 052 150 A2-

Removing

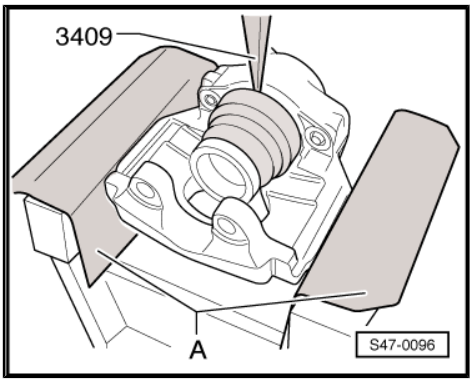
– Removing brake calliper
⇒ “1.3.2 Removing and installing brake caliper FN3”, page 49

– Insert wooden plate to avoid damaging the piston as it is being pressed out.

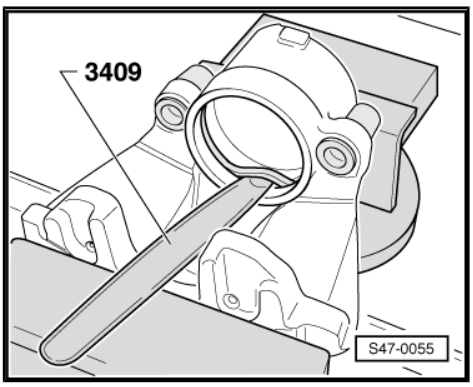
– Press the piston out of the brake caliper housing using compressed air -arrow-.



– Lever off protective cap with disassembly wedge - 3409- from the brake caliper.



– Remove gasket ring with disassembly wedge - 3409- .



Note

When removing, make sure that the cylinder surface is not damaged.

Installing

Note

♦ *Always install the complete repair kit when repairing the brake calliper.*

♦ *Use only methylated spirits for cleaning the brake.*

♦ *New brake calipers are filled with brake fluid and are pre-bled.*

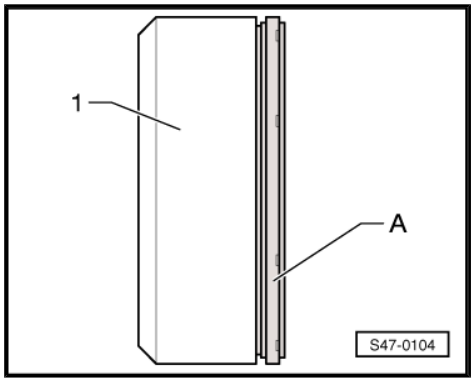
♦ *It is absolutely necessary, if repairs are being undertaken, to pre-bleed the brake calipers before installing them in the vehicle (without brake pads)* ⇒ page 97 .

– Clean piston and gasket ring with white spirits and dry off.

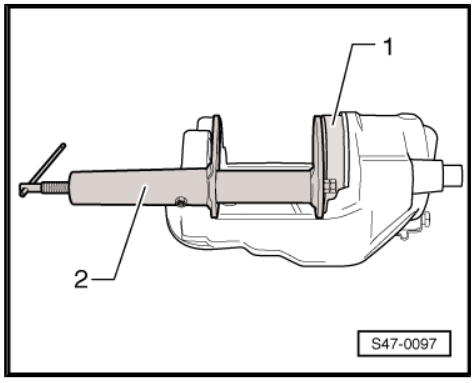
– Before inserting the piston and gasket ring, thinly coat with lithium grease - G 052 150 A2- .

– Insert sealing ring into the brake caliper.

– Position the protective cap -A- on the assembly tool -T10146/6- -1-.



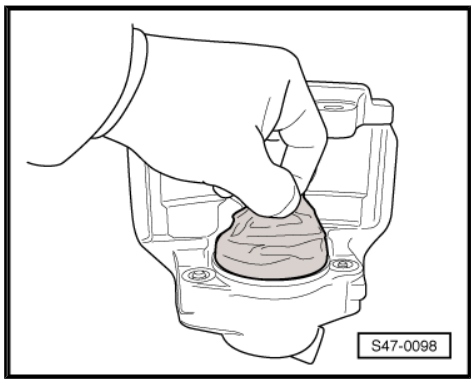
– Press the protective cap with the assembly tool -T10146/6- -1- and the piston resetting jig -T10145- -2- onto the brake caliper so that this lies in contact all around the brake caliper.



– Check fitting of the protective cap.

Note

The protective cap should no longer be removable by hand from the brake caliper.

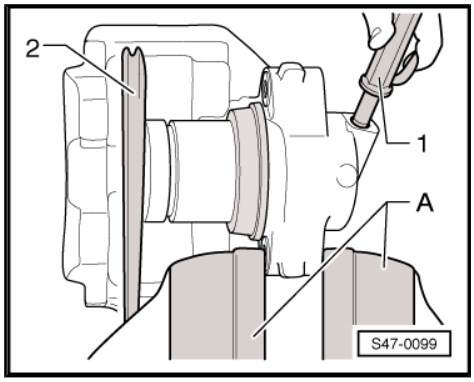


– Press the pistons lightly onto the protective cap and lock in this position, e.g. with Disassembly wedge -3409- -2-.

Note

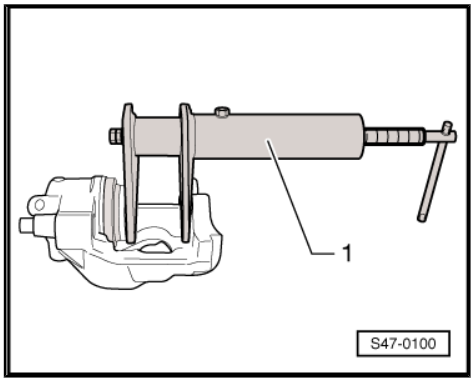
Do not tilt the piston, in order to avoid damage to the protective cap.

– Blow up the protective cap with compressed air (max. 0.3 MPa) -1-. At the same time the protective cap jumps onto the piston.



– Press the piston with the piston jig -T10145- -1- into the brake caliper.

The outer sealing lip of the protective cap will clip into the piston groove.



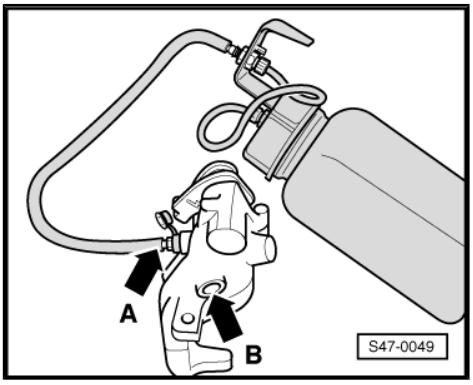
Pre-bleeding the brake caliper

Set up brake caliper for pre-bleeding as shown in the fig.

– Open vent valve -arrow A-.

– Using a commercially available ventilation reservoir pour in brake fluid until bubble-free brake fluid drips out of the threaded bore (brake hose connection) -arrow B-.

– Close vent valve.

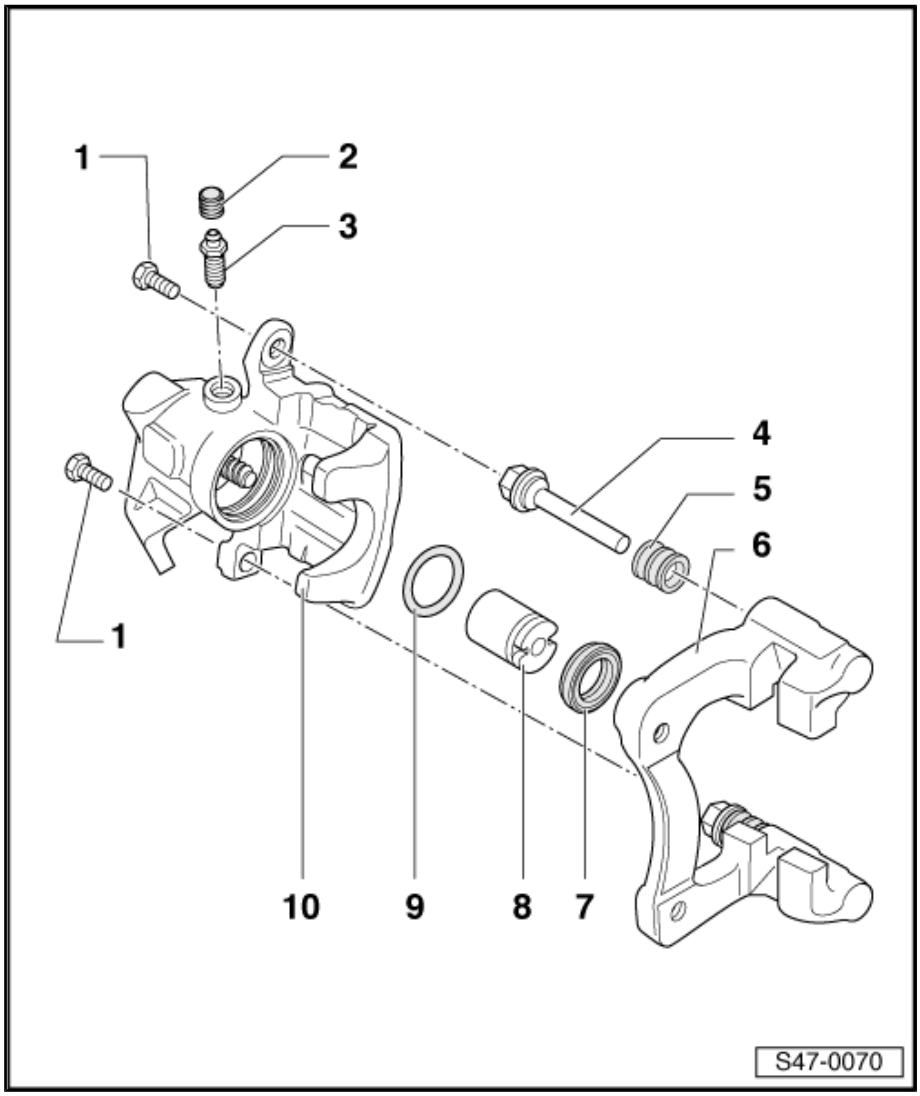


2 Rear brake caliper

⇒ “2.1 Summary of components - rear brake caliper”, page 98

⇒ “2.2 Removing and installing brake caliper piston”, page 99

2.1 Summary of components - rear brake caliper



1 - Self-locking screw

- ❑ Replace after removal
- ❑ counterhold on the guide bolt when releasing and tightening
- ❑ 35 Nm

2 - Dust cap

3 - Vent valve

- ❑ thinly coat thread with lithium grease - G 052 150 A2- before screwing in
- ❑ 10 Nm

4 - Guide bolt

- ❑ grease before fitting protective cap - Pos. -5-
- ❑ Use the grease packing supplied with the repair kit for greasing

5 - Collar

- ❑ pull onto brake carrier and guide bolt

6 - Brake carrier with guide bolts and boots

- ❑ must be assembled with sufficient grease on the guide bolt, supplied as a spare part
- ❑ if there is any damage to the protective caps or guide bolts fit a repair set (use the enclosed grease packing to lubricate the guide bolts)

7 - Collar

- ❑ Removing and installing ⇒ “2.2 Removing and installing brake caliper piston”, page 99
- ❑ do not damage when inserting the piston

8 - Piston with automatic adjusting device

- ❑ Removing and installing ⇒ “2.2 Removing and installing brake caliper piston”, page 99

9 - Sealing ring

- ❑ Removing and installing ⇒ “2.2 Removing and installing brake caliper piston”, page 99

10 - Brake caliper housing with lever for the handbrake cable

- ❑ replace brake caliper housing if the lever for the handbrake cable is not sealed
- ❑ pre-bleed brake caliper housing after undertaking replacement ⇒ page 100

2.2 Removing and installing brake caliper piston

Special tools and workshop equipment required

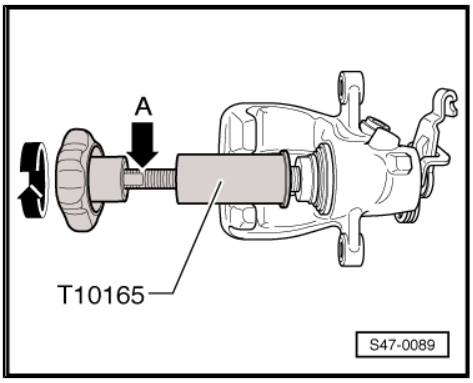
- ♦ Resetting tool - T10165-
- ♦ Disassembly wedge - 3409-
- ♦ Grease - G 052 150 A2-
- • Install the complete repair set when undertaking repairs.
- • The brake calipers must be pre-bled before installing them in the vehicle (without brake pads) in case of a repair or when replacing them with new brake calipers ⇒ page 100 .
- • Thinly coat brake cylinder, piston and gasket ring with lithium grease - G 052 150 A2- .

Removing

– Insert the resetting tool - T10165- in such a way that the collar of the resetting tool is resting on the piston.

– Release the piston by turning the knurled wheel of the resetting tool - T10165- to the left.

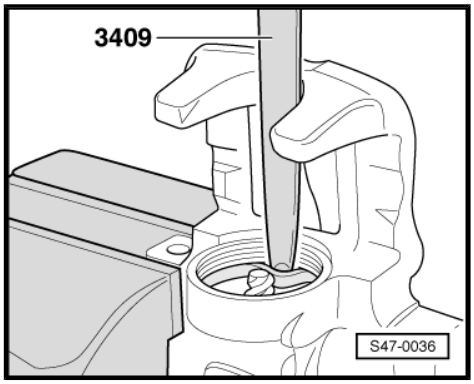
Use open-jawed spanner on a provided spanner surface -A- if the piston is difficult to move.



Note

Make sure that the cylinder surface is not damaged when removing the gasket ring.

– Remove gasket ring with disassembly wedge - 3409- .



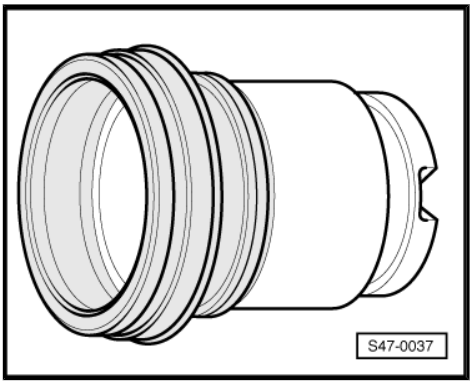
Installing

– Clean piston and gasket ring with white spirits and dry off.

– Before inserting the piston and gasket ring in the brake caliper, thinly coat with grease - G 052 150 A2- .

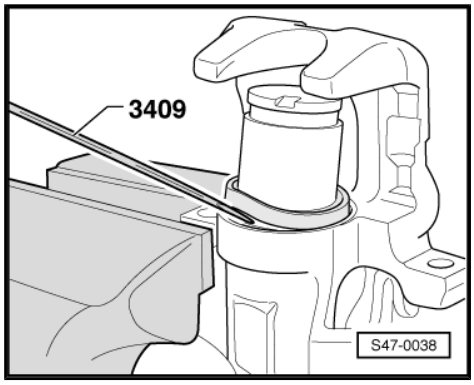
– Insert new gasket ring in the brake caliper.

– Position the protective cap with the outer sealing lip on the piston.



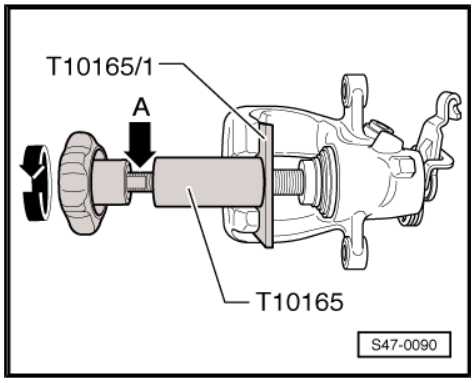
– Insert inner sealing lip of the protective cap with disassembly wedge - 3409- in the groove of the cylinder.

  To do so hold the piston with the hand.



– Insert resetting tool - T10165- .
– Use special tool - T10165/1- for assembly.
– Screw in piston by turning the knurled wheel to the right.

Use open-jawed spanner on a provided spanner surface -A- if the piston is difficult to move.



Note

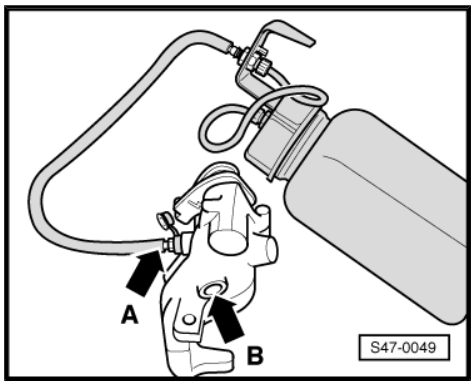
- *When resetting the piston with a resetting tool the automatic piston setting in the brake caliper is destroyed.*
- *The brake calipers must be pre-bled before installing them in the vehicle (without brake pads) in case of a repair or when replacing them with new brake calipers* *⇒ page 100* *.*

– Insert brake pads.

Pre-bleeding the brake caliper

Set up brake caliper for pre-bleeding as shown in the fig.

– Open vent valve -arrow A-.
– Using a commercially available ventilation reservoir pour in brake fluid until bubble-free brake fluid drips out of the threaded bore (brake hose connection) -arrow B-.
– Close vent valve.



3 Brake servo unit and master brake cylinder

⇒ “3.1 Summary of components - brake servo unit and master brake cylinder”, page 101

⇒ “3.2 Check the operation of the brake servo unit”, page 104

⇒ “3.3 Removing and installing brake light switch”, page 105

⇒ “3.4 Checking the master brake cylinder for tightness”, page 105

⇒ “3.5 Removing and installing master brake cylinder”, page 106

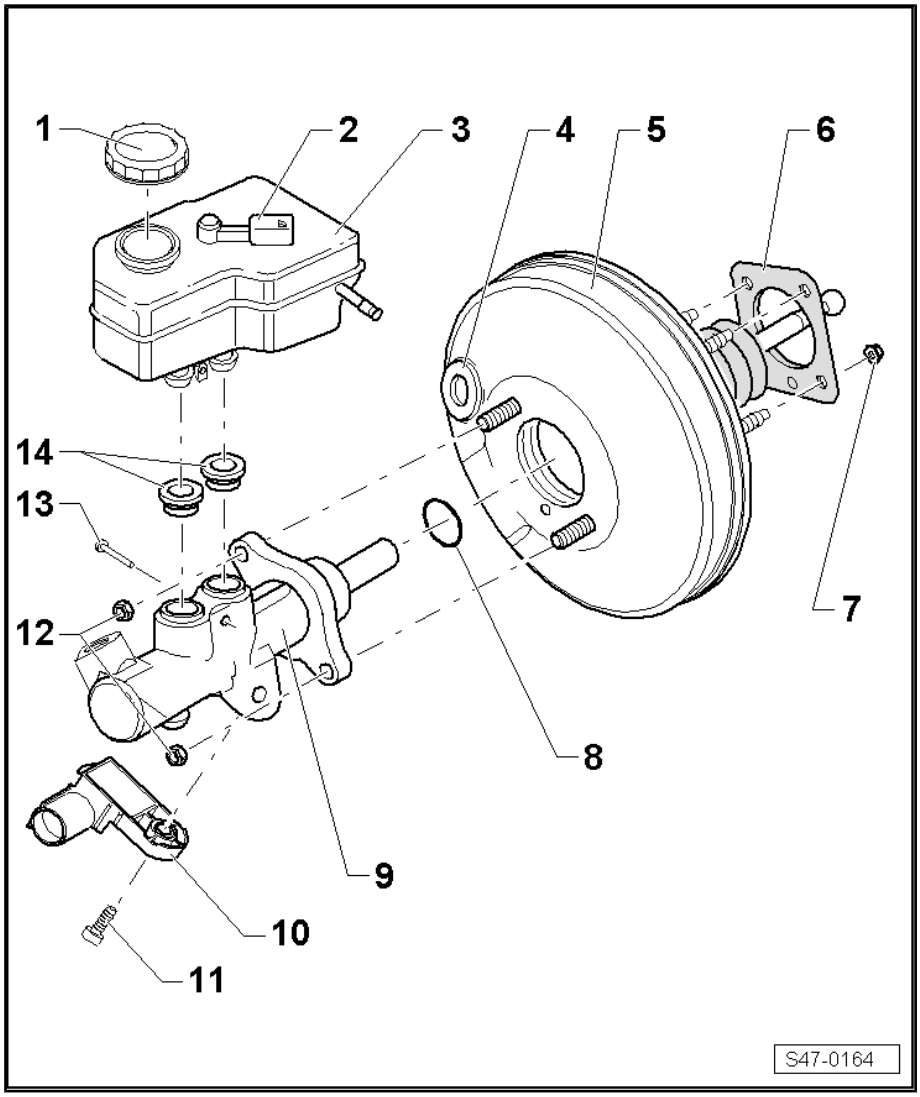
⇒ “3.6 Removing and installing brake servo”, page 114

3.1 Summary of components - brake servo unit and master brake cylinder

⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101

⇒ “3.1.2 Summary of components - brake servo unit/master brake cylinder, right-hand drive vehicles”, page 103

3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles



1 - Screw cap

2 - Brake fluid level warning contact - F34-

3 - Brake fluid reservoir

4 - Plugs

5 - Brake servo

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts
- ❑ Inspect proper operation ⇒ “3.2 Check the operation of the brake servo unit”, page 104
- ❑ Non-return valve (in vacuum hose); Functional test ⇒ “4.2 Checking the non-return valve”, page 140
- ❑ separate from brake pedal ⇒ “4.3 Separating brake pedal from brake servo”, page 87
- ❑ Removing and installing ⇒ “3.6 Removing and installing brake servo”, page 114

6 - Seal

- ❑ for brake servo

7 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ Tightening torque ⇒ “4.1 Assembly overview - brake pedal”, page 78

8 - Sealing ring

- ❑ Replace after removal

9 - Master brake cylinder

- ❑ cannot be repaired, replace completely in the event of faults
- ❑ Check for leaks ⇒ “3.4 Checking the master brake cylinder for tightness”, page 105
- ❑ Removing and installing ⇒ “3.5 Removing and installing master brake cylinder”, page 106

10 - Brake light switch - F-

- ❑ Including brake pedal switch - F47-
- ❑ Removing and installing ⇒ “3.3 Removing and installing brake light switch”, page 105

11 - Screw

- ❑ 7 Nm

12 - Nut

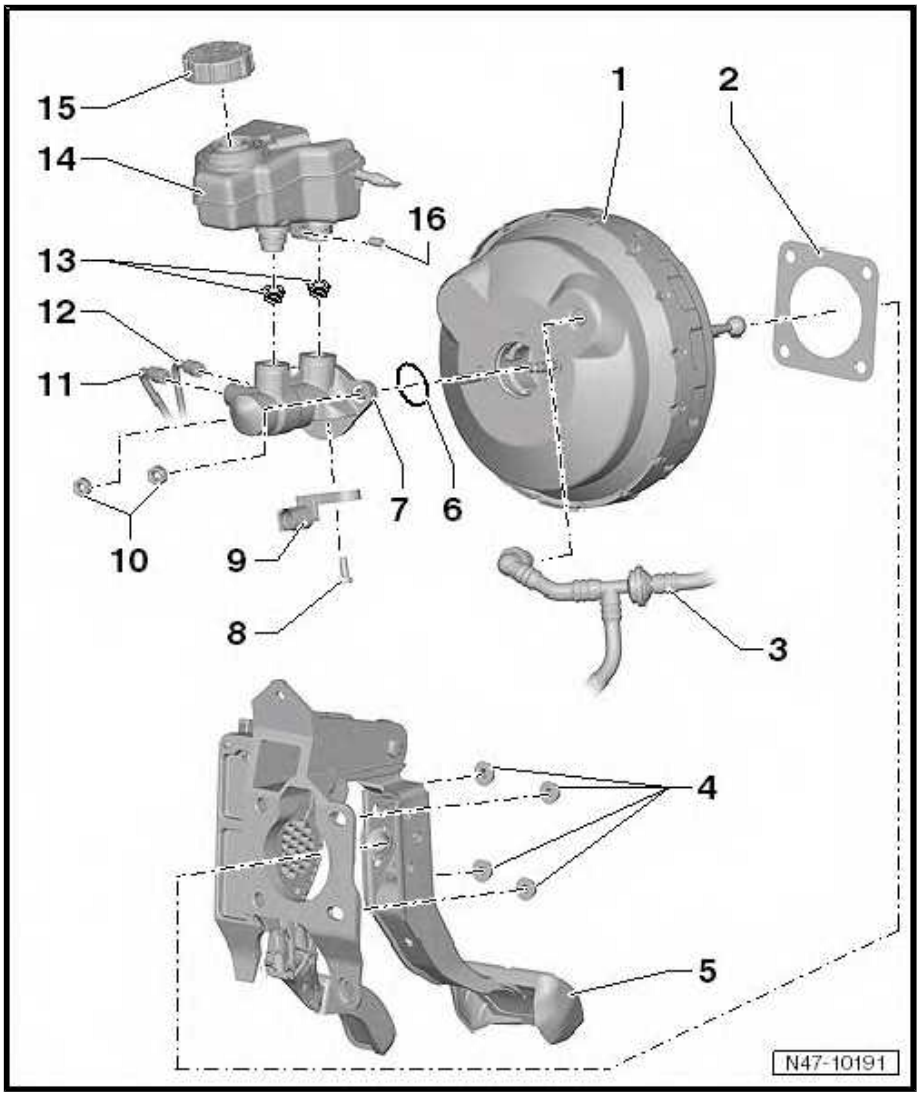
- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

13 - Securing pin

14 - Plugs

- ❑ moisten with brake fluid and press in brake fluid reservoir

3.1.2 Summary of components - brake servo unit/master brake cylinder, right-hand drive vehicles



1 - Brake servo

- ❑ different versions ⇒ electronic catalogue of original parts
- ❑ Inspect proper operation ⇒ “3.2 Check the operation of the brake servo unit”, page 104
- ❑ separate from brake pedal ⇒ “4.3 Separating brake pedal from brake servo”, page 87
- ❑ Removing and installing ⇒ “3.6 Removing and installing brake servo”, page 114

2 - Seal

- ❑ for brake servo

3 - Vacuum line

- ❑ Non-return valve (in vacuum hose); Functional test ⇒ “4.2 Checking the non-return valve”, page 140

4 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ Tightening torque ⇒ “4.1 Assembly overview - brake pedal”, page 78

5 - Bearing bracket

- ❑ Removing and installing ⇒ “4.2 Removing and installing bearing bracket”, page 84

6 - Sealing ring

- ❑ Replace after removal

7 - Master brake cylinder

- ❑ cannot be repaired, replace completely in the event of faults
- ❑ Removing and installing ⇒ “3.5.3 Removing and installing master brake cylinder, right-hand drive vehicles”, page 112
- ❑ Check for leaks ⇒ “3.4 Checking the master brake cylinder for tightness”, page 105

8 - Screw

- ❑ 7 Nm

9 - Brake light switch - F-

- ❑ Including brake pedal switch - F47-
- ❑ Removing and installing ⇒ “3.3 Removing and installing brake light switch”, page 105

10 - Nut

- ❑ self-locking
- ❑ Replace after removal
- ❑ 25 Nm

11 - Brake line

12 - Brake line

13 - Plugs

- ❑ moisten with brake fluid and press in brake fluid reservoir

14 - Brake fluid reservoir

15 - Screw cap

16 - Screw

- ❑ 4 Nm

3.2 Check the operation of the brake servo unit

Note

- ♦ *on petrol engines the required negative pressure is drawn from the intake manifold*
- ♦ *vehicles using a diesel engine are fitted with a vacuum pump for generating a low pressure*

– Check all underpressure lines of the brake servo unit.

– Checking the non-return valve
⇒ “4.2 Checking the non-return valve”, page 140

– With the engine off press down brake pedal repeatedly with force, this reduces the low pressure already present in the system.

– Hold the brake pedal in brake position using a medium foot pressure and start the engine.

If the brake servo unit operates perfectly the brake pedal must yield noticeably under your foot after starting the engine (servo boost takes effect).

Replace faulty brake servo units
⇒ “3.6 Removing and installing brake servo”, page 114 .

3.3 Removing and installing brake light switch

⇒ “3.3.1 Removing and installing brake light switch, left-hand drive vehicles”, page 105

⇒ “3.3.2 Removing and installing brake light switch, right-hand drive vehicles”, page 105

3.3.1 Removing and installing brake light switch, left-hand drive vehicles

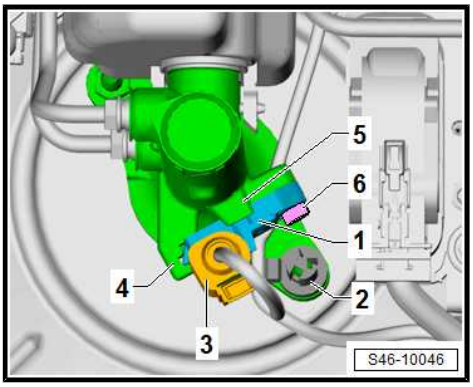
Removing

For better access to the connector for the brake light switch, the air filter ⇒ Engine; Rep. gr. 24 (petrol engines) or ⇒ Engine; Rep. gr. 23 (diesel engines), possibly the air guide pipe, can be removed.

– Unlock and disconnect connector -3- from the brake light switch - F- .

– Unscrew screw for brake light switch - F- -6- from the master brake cylinder -5-.

– Pull the brake light switch - F- -1- off the master brake cylinder -5- and then remove from the retaining tab -4- of the master brake cylinder.



Installing

– Installation is carried out in the reverse order.

Tightening torques

♦ ⇒ “3.1 Summary of components - brake servo unit and master brake cylinder”, page 101

3.3.2 Removing and installing brake light switch, right-hand drive vehicles

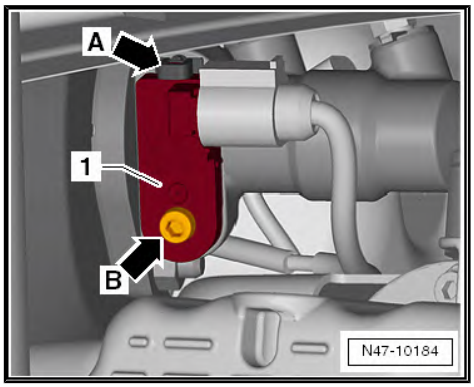
Removing

– Unlock and disconnect connector from the brake light switch - F- .

– Unscrew screw -arrow B- for brake light switch - F- -1- from the master brake cylinder.

– Remove brake light switch - F- -1- from the master brake cylinder.

– Take the brake light switch - F- -1- out of the retaining tab -arrow A- of the master brake cylinder.



Installing

– Installation is carried out in the reverse order.

Tightening torques

♦ ⇒ “3.1 Summary of components - brake servo unit and master brake cylinder”, page 101

3.4 Checking the master brake cylinder for tightness

Special tools and workshop equipment required

♦ Brake-power regulator or brake system tester , e.g. -V.A.G 1310- or -V.A.G 1310 A-

- Lithium grease - G 052 150 A2-

Test condition

- Function and tightness of the brake system (hydraulic control unit or load-dependent brake-power regulator, brake lines, brake hoses, brake caliper and wheel-brake cylinder) O.K.

Checking

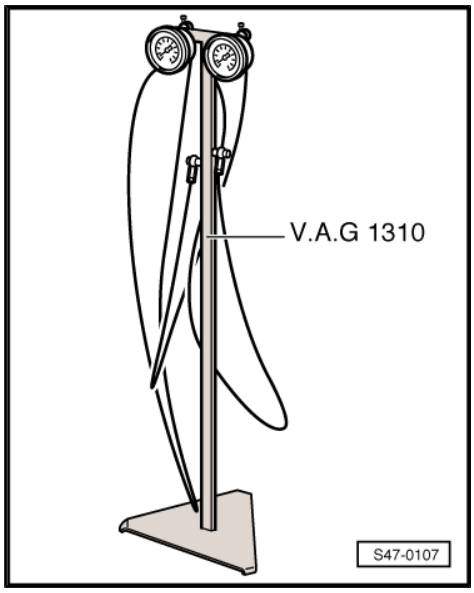
– Unscrew and remove the bleeder screw on one of the front brake calipers.

– Connect the pressure gauge of the tester - V.A.G 1310 - or - V.A.G 1310 A- and bleed.

– Push down brake pedal until the pressure gauge on the tester indicates 5 MPa (50 bar).

– Throughout the test which lasts 45 seconds the pressure loss must not exceed 0.4 MPa (4 bar).

– If the pressure loss exceeds 0,4 MPa (4 bar) replace the master brake cylinder.



Tightening torques

- ⇒ “1.1 Summary of components - front brake caliper”, page 90

3.5 Removing and installing master brake cylinder

⇒ “3.5.1 Removing and installing master brake cylinder, left-hand drive vehicles from 21/2015”, page 106

⇒ “3.5.2 Removing and installing master brake cylinder, left-hand drive vehicles from 22/2015”, page 108

⇒ “3.5.3 Removing and installing master brake cylinder, right-hand drive vehicles”, page 112

3.5.1 Removing and installing master brake cylinder, left-hand drive vehicles from 21/2015

Special tools and workshop equipment required

- Assembly pliers , e.g. -VAS 6340-
- Vehicle diagnosis tester - VAS-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)
- Repair kit -1H0 698 311 A-

Brake fluid assignment ⇒ Electronic Catalogue of Original Parts .

- The master brake cylinder must not be repaired.

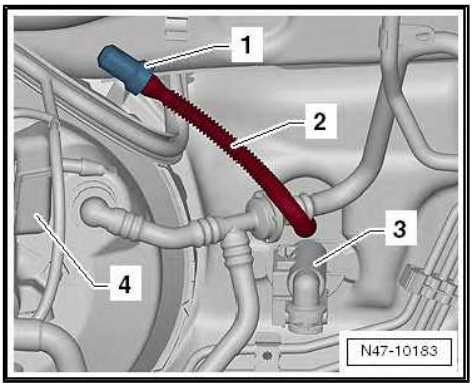
Removing

– Remove engine cover ⇒ Engine; Rep. gr. 10 .

– Remove air filter ⇒ Engine; Rep. gr. 24 (fuel engines) or ⇒ Engine; Rep. gr. 23 (diesel engines).
– Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
– Drain the brake fluid from the brake fluid reservoir using the brake filling and bleeding device e.g. -VAS 5234- .
– Lay sufficient non-fluffing cloths around the engine.

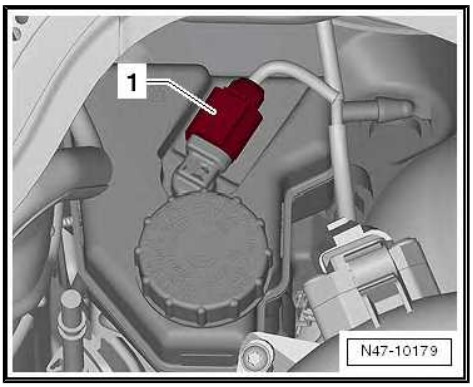
For vehicles with manual gearbox

– Detach the hose -2- of the running-on line to the clutch master cylinder from the brake fluid reservoir -4-.
– Seal off the hole in the hose -2- using the closing tool - T10249--1-.
– Tie up hose -2-.

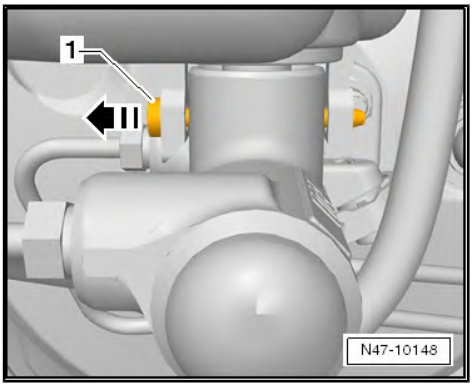


Continued for all vehicles

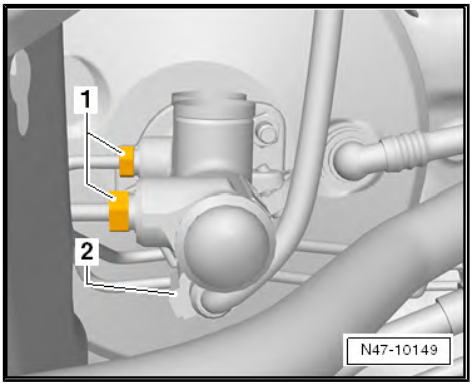
– Disconnect plug -1- from the brake fluid level warning contact - F34- .



– Pull the securing pin -1- in -direction of arrow- out of the master brake cylinder.
– Pull the brake fluid reservoir carefully out of the plugs of the master brake cylinder.



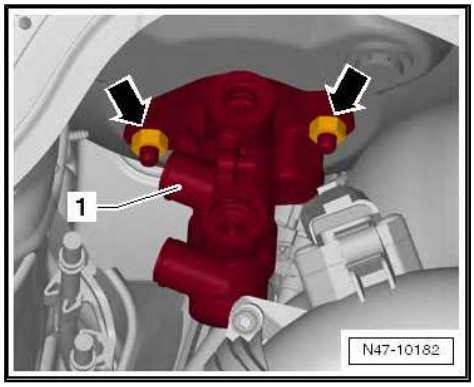
– Disconnect connector -2- from the brake light switch - F- .
– Mark brake lines -1-.
– Unscrew the brake lines -1- from the master brake cylinder and shut off.
– Shut-off the connections of the brake lines on the master brake cylinder with screw plugs from the repair kit -1H0 698 311 A- .



– Remove nuts for master brake cylinder -arrows-.

– Carefully pull off the master brake cylinder -1- from the brake servo unit.

– Remove brake light switch - F- ⇒ “3.3 Removing and installing brake light switch”, page 105 .



Installing

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Only fill up with new brake fluid.

Installation is carried out in the reverse order.

– Fill up with new brake fluid.

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

– Install air filter ⇒ Engine; Rep. gr. 24 (petrol engines) or ⇒ Engine; Rep. gr. 23 (diesel engines).

– Install the battery and battery tray ⇒ Electrical System; Rep. gr. 27 .

– Install engine cover ⇒ Engine; Rep. gr. 10 .

Tightening torques

♦ ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101

♦ ⇒ “3 Control unit and hydraulic unit”, page 15

3.5.2 Removing and installing master brake cylinder, left-hand drive vehicles from 22/2015

Special tools and workshop equipment required

♦ Brake filling and bleeding device , e. g. -VAS 5234-

♦ Repair kit - 1H0 698 311 A-

♦ Closing tool - T10249-

♦ Release tool - T10527- (for 1.2 TSI engine)

Brake fluid assignment ⇒ Electronic Catalogue of Original Parts .

- The master brake cylinder must not be repaired.

Removing

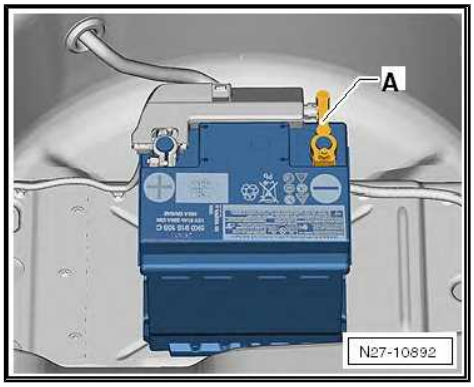
For vehicles with the battery in the rear.

The battery is located in the luggage compartment at the spot for the spare wheel.

– Disconnect earth strap -A- of the battery ⇒ Electrical system; Rep. gr. 27 .

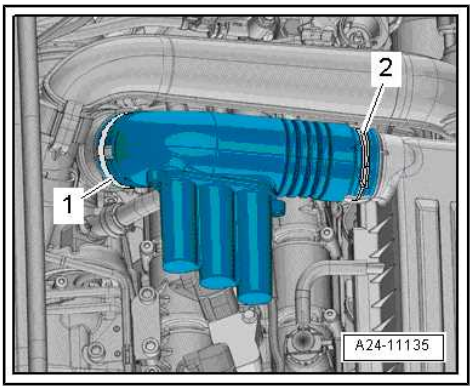
Continued for all vehicles

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

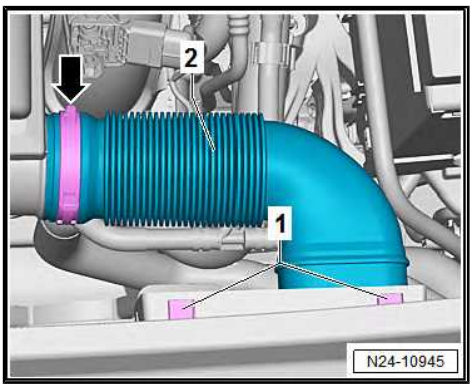


For vehicles with a 1.2 TSI engine

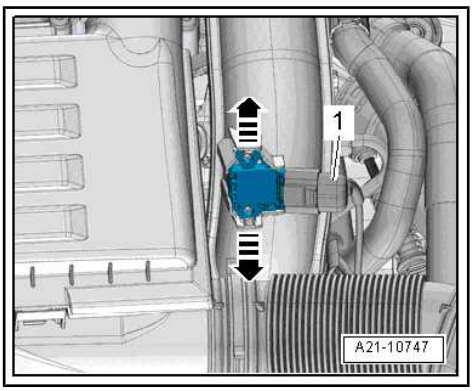
– Release hose clamps -1- and -2- and remove air guide pipe.



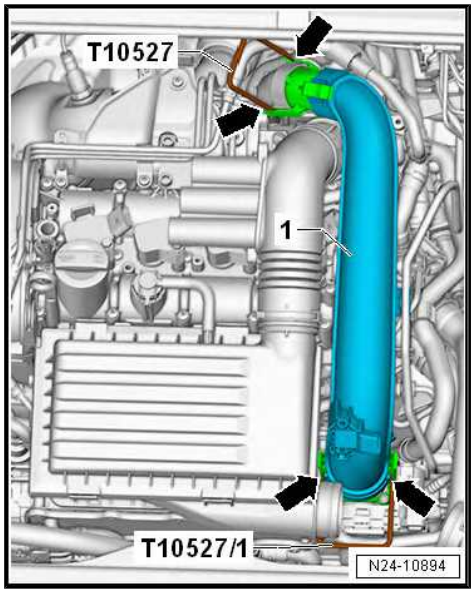
– Undo hose clamp -arrow- and press out air guide pipe from holding clamps -1-.
– Remove air guide pipe -2-.



– Disconnect plug from charge pressure sender - GX26- -1-.



– Using the release tool - T10527- , unlock the catches -arrows- and remove the air guide pipe -1-.



For vehicles with a 1.6 MPI engine

– Remove air filter housing ⇒ Engine; Rep. gr. 24 .

For vehicles with 1.6 MPI engine with automatic gearbox

– Undo the mounting bracket with the automatic gearbox control unit - J217- and place the ⇒ gearbox; Rep. gr. 37 down to the side.

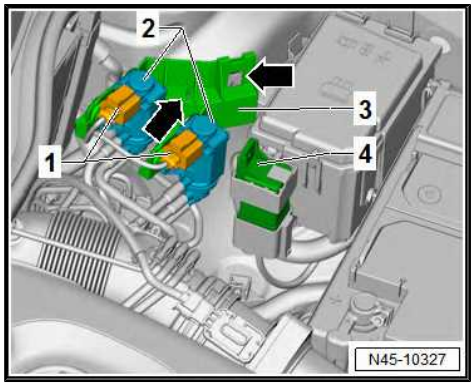
For vehicles with a 1.4 TDI engine

– Remove engine cover ⇒ Engine; Rep. gr. 10 .

– Remove air filter housing ⇒ Engine; Rep. gr. 23 .

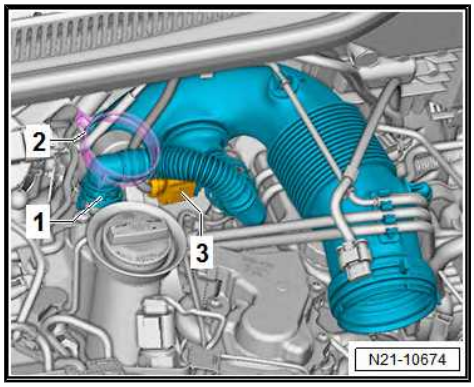
– Mark and pull off connector -1- of the boost pressure actuator - V465- and the change over valve for the intake manifold valve - N239- -2-.

– Remove bracket -3- together with the boost pressure actuator - V465- and the change over valve for the intake manifold valve - N239- , place down to the side.



– Pinch the release button on the hose for the housing ventilation -1- and remove.

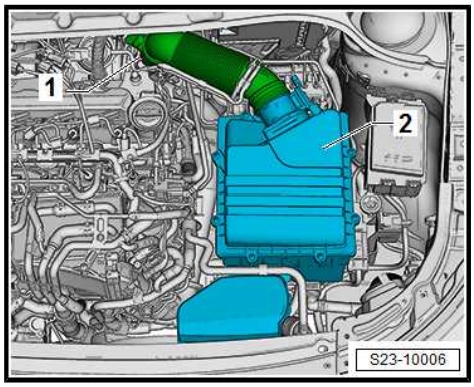
– Open hose clamp -2- loosen the air guide pipe and place it down to the side together with the boost pressure actuator - V465- and the change over valve for the intake manifold valve - N239- .



For vehicles with a 1.6 TDI engine

– Remove engine cover ⇒ Engine; Rep. gr. 10 .

– Loosen hose clamp -1- and remove the complete air filter housing -2- ⇒ Engine; Rep. gr. 23 .



Continued for all vehicles

– Lay sufficient non-fluffing cloths in the plenum chamber in the area underneath the master brake cylinder.

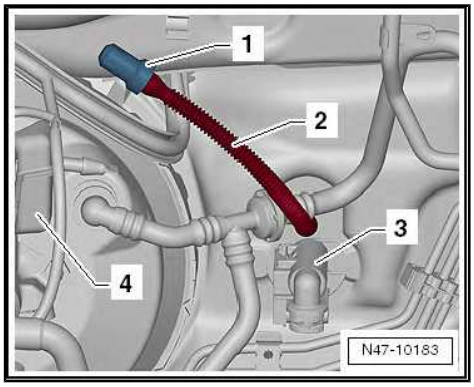
– Drain the brake fluid from the brake fluid reservoir using the brake filling and bleeding device e.g. -VAS 5234- .

For vehicles with manual gearbox

– Detach the hose -2- of the running-on line to the clutch master cylinder from the brake fluid reservoir -4-.

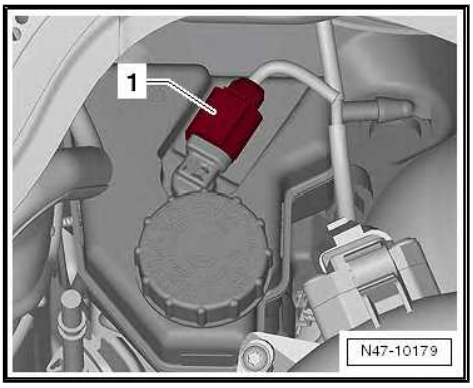
– Seal off the hole in the hose -2- using the closing tool - T10249--1-.

– Tie up hose -2-.



Continued for all vehicles

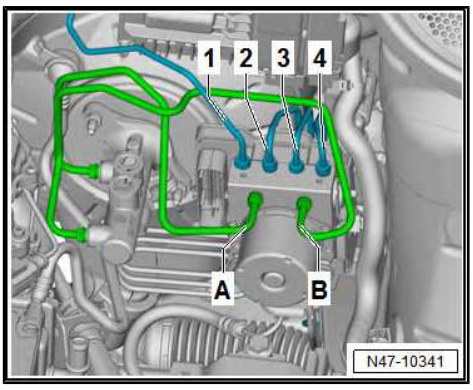
– Disconnect plug -1- from the brake fluid level warning contact - F34- .



– Mark the brake lines -A- and -B- from the hydraulic unit to master brake cylinder.

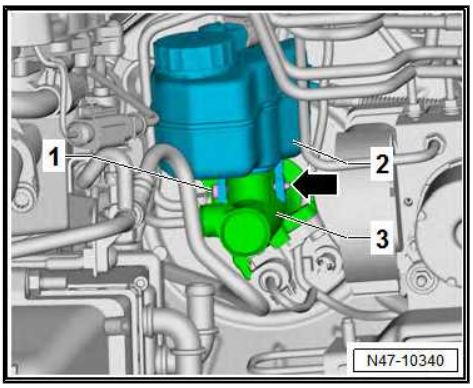
– Disconnect and remove brake lines -A- and -B- from the hydraulic unit and the master brake cylinder.

– Close the openings at the hydraulic unit and the master brake cylinder using screw plugs from the repair kit -1H0 698 311 A- .



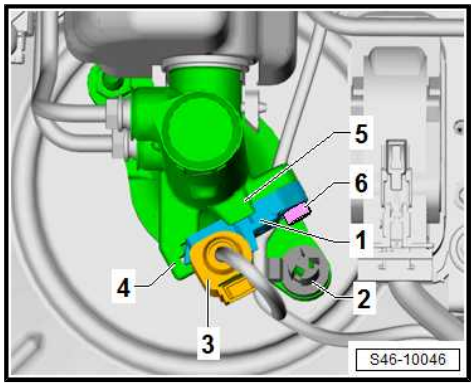
– Pull out fixing pin -1- for brake fluid reservoir -2- in -direction of arrow-.

– Pull the brake fluid reservoir -2- carefully out of the plugs of the master brake cylinder -3-.



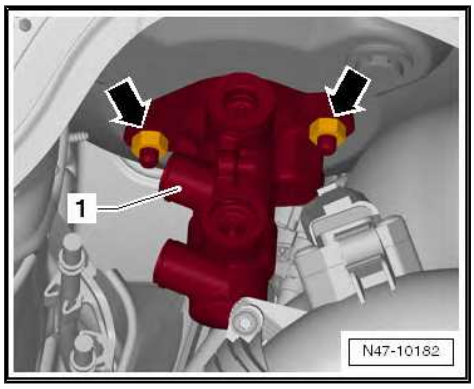
– Disconnect connector -3- from the brake light switch - F1- .

– Remove bracket for electrical line -2- from the screw (if present).



– Remove nuts for master brake cylinder -arrows-.

– Carefully pull off the master brake cylinder -1- from the brake servo unit.



Installing

Installation is carried out in the reverse order.

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Only fill up with new brake fluid.

– Fill up with new brake fluid.

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

– Install air filter ⇒ Engine; Rep. gr. 24 (petrol engines) or ⇒ Engine; Rep. gr. 23 (diesel engines).

– Install and/or connect the battery ⇒ Electrical system; Rep. gr. 27 .

– Install engine cover ⇒ Engine; Rep. gr. 10 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15

3.5.3 Removing and installing master brake cylinder, right-hand drive vehicles

Special tools and workshop equipment required

- Vehicle diagnosis tester - VAS-
- Closing tool - T10249-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)
- Repair kit -1H0 698 311 A-

Brake fluid assignment ⇒ Electronic Catalogue of Original Parts .

- The master brake cylinder must not be repaired.

Removing

– Remove engine cover ⇒ Engine; Rep. gr. 10 .

– Drain the brake fluid from the brake fluid reservoir using the brake filling and bleeding device e.g. -VAS 5234- .

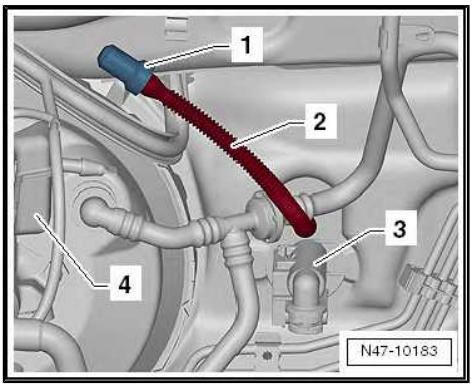
– Lay sufficient non-fluffing cloths in the plenum chamber in the area underneath the master brake cylinder.

For vehicles with manual gearbox

– Detach the hose -2- of the running-on line to the clutch master cylinder from the brake fluid reservoir -4-.

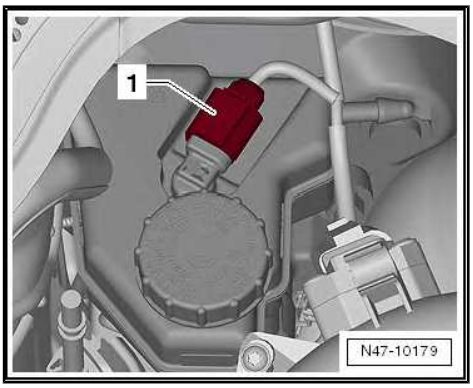
– Seal off the hole in the hose -2- using the closing tool - T10249--1-.

– Tie up hose -2-.



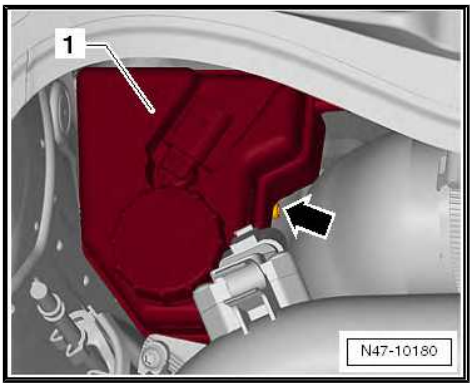
Continued for all vehicles

– Disconnect plug -1- from the brake fluid level warning contact - F34- .



– Remove retaining screw for brake fluid reservoir-1- -arrow-.

– Pull the brake fluid reservoir carefully out of the plugs of the master brake cylinder.

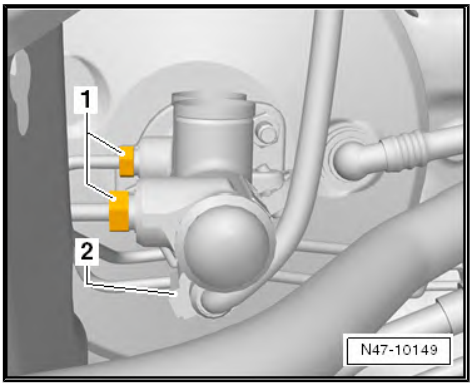


– Disconnect connector -2- from the brake light switch - F- .

– Mark brake lines -1-.

– Disconnect the brake lines -1- from the master brake cylinder and shut off.

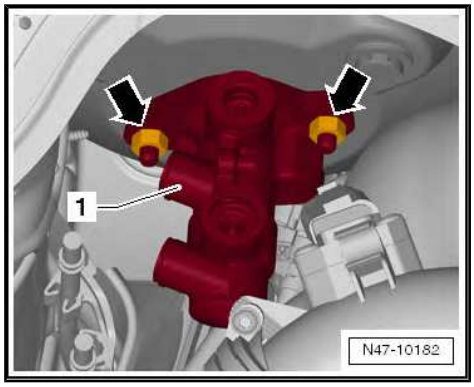
– Shut-off the connections of the brake lines on the master brake cylinder with screw plugs from the repair kit -1H0 698 311 A- .



– Remove nuts for master brake cylinder -arrows-.

– Carefully pull off the master brake cylinder -1- from the brake servo unit.

– Remove brake light switch - F- ⇒ “3.3 Removing and installing brake light switch”, page 105 .



Installing

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Only fill up with new brake fluid.

Installation is carried out in the reverse order.

– Fill up with new brake fluid.

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

– Install engine cover ⇒ Engine; Rep. gr. 10 .

Tightening torques

◆ ⇒ “3.1.2 Summary of components - brake servo unit/master brake cylinder, right-hand drive vehicles”, page 103

◆ ⇒ “3 Control unit and hydraulic unit”, page 15

3.6 Removing and installing brake servo

⇒ “3.6.1 Removing and installing brake servo, left-hand drive vehicles from 21/2015, 1.2 TSI engine”, page 114

⇒ “3.6.2 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.2 TSI engine”, page 116

⇒ “3.6.3 Removing and installing brake servo, left-hand drive vehicles up to 21/2015, 1.6 MPI engine”, page 118

⇒ “3.6.4 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.6 MPI engine”, page 119

⇒ “3.6.5 Removing and installing brake servo, left-hand drive vehicles up to 21/2015, 1.4 TDI engine”, page 120

⇒ “3.6.6 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.4 TDI engine”, page 121

⇒ “3.6.7 Removing and installing brake servo, left-hand drive vehicles up to 21/2015, 1.6 TDI engine”, page 123

⇒ “3.6.8 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.6 TDI engine”, page 124

⇒ “3.6.9 Removing and installing brake servo, right-hand drive - diesel engines”, page 126

⇒ “3.6.10 Removing and installing brake servo, right-hand drive - petrol engines”, page 131

3.6.1 Removing and installing brake servo, left-hand drive vehicles from 21/2015, 1.2 TSI engine

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

Removing

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

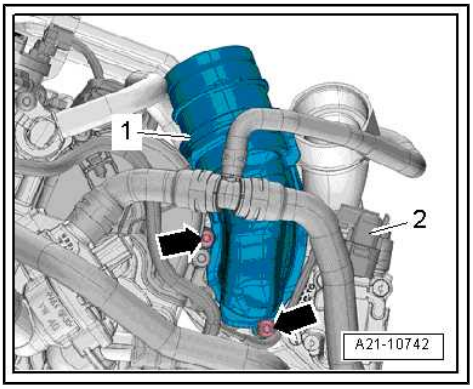
– Remove master brake cylinder
⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit
⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

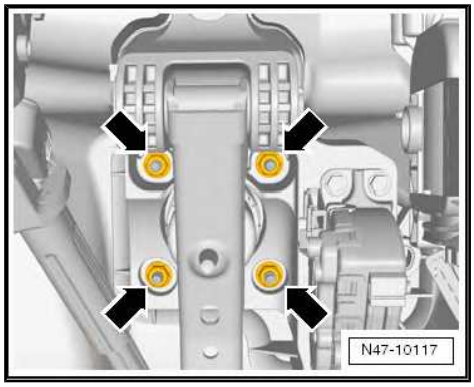
– Unscrew the screws -arrows- and remove the connection of the exhaust gas turbocharger.

– Pull the engine control unit - J623- out of the bracket and lay to the side ⇒ Engine; Rep. gr. 23 .

– Disconnect vacuum line from the brake servo.



– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Support of the exhaust gas turbocharger ⇒ Engine; Rep. gr. 21

3.6.2 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.2 TSI engine

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

Removing

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

– Remove master brake cylinder ⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

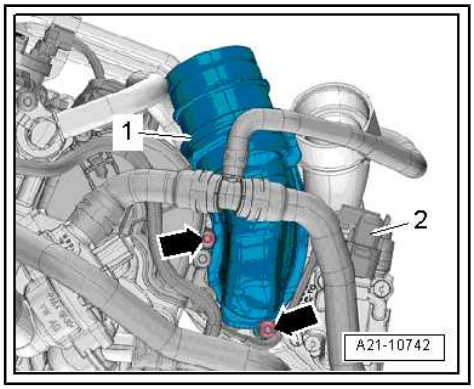
– Unscrew the screws -arrows- and remove the connection of the exhaust gas turbocharger.

– Remove the engine control unit - J623- and lay the cable to the side ⇒ Engine; Rep. gr. 23 .

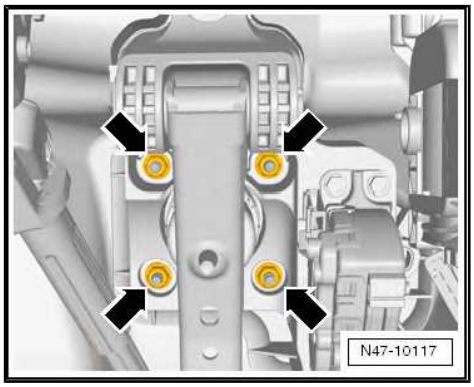
– Remove ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ “3.2.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , left -hand drive vehicles from 22/2015”, page 28 .

– Remove bracket for ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ “3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015”, page 21

– Disconnect vacuum line from the brake servo.



– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Support of the exhaust gas turbocharger ⇒ Engine; Rep. gr. 21

3.6.3 Removing and installing brake servo, left-hand drive vehicles up to 21/2015, 1.6 MPI engine

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

Removing

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

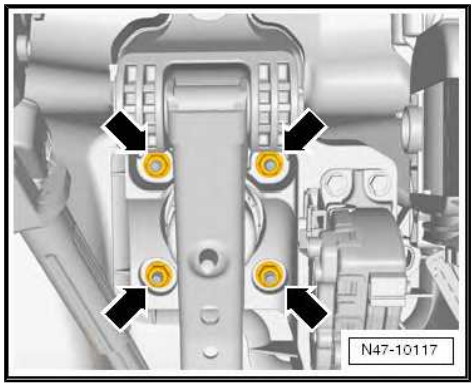
– Remove master brake cylinder ⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

– Pull the engine control unit - J623- out of the bracket and lay to the side ⇒ Engine; Rep. gr. 23 .

– Disconnect vacuum line from the brake servo.

– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15

3.6.4 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.6 MPI engine

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

Removing

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

– Remove master brake cylinder
⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit
⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

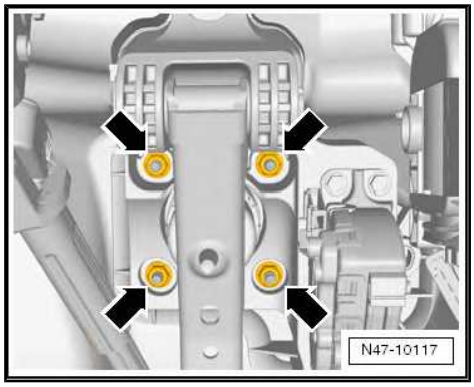
– Remove the engine control unit - J623- and lay the cable to the side ⇒ Engine; Rep. gr. 23 .

– Remove ABS control unit - J104- / ABS hydraulic unit - N55-
⇒ “3.2.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , left -hand drive vehicles from 22/2015”, page 28 .

– Remove bracket for ABS control unit - J104- / ABS hydraulic unit - N55-
⇒ “3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015”, page 21

– Disconnect vacuum line from the brake servo.

– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

♦ ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101

♦ ⇒ “3 Control unit and hydraulic unit”, page 15

3.6.5 Removing and installing brake servo, left-hand drive vehicles up to 21/2015, 1.4 TDI engine

Special tools and workshop equipment required

♦ Release tool - T10159A- or -T10159B-

♦ Brake filling and bleeding device , e. g. -VAS 5234-

♦ Extraction bottle (commercially available)

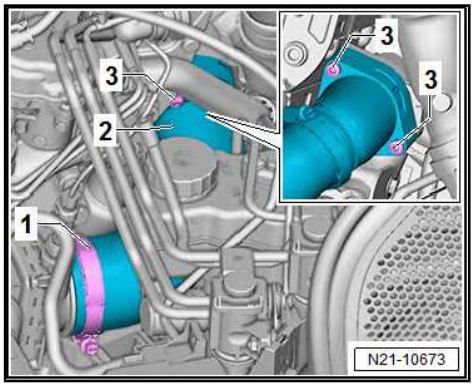
Removing

– Remove battery ⇒ Electrical System; Rep. gr. 27 .

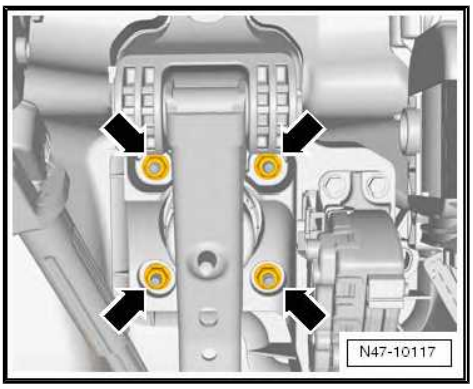
– Remove master brake cylinder ⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

– Loosen clamp -1- on the charge air hose of the exhaust gas turbocharger.
– Unscrew screws -3- and remove pulsation dampener -2- including charge air hose.
– Pull the engine control unit - J623- out of the bracket and lay to the side ⇒ Engine; Rep. gr. 23 .
– Disconnect vacuum line from the brake servo.



– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .
– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .
– Connect battery ⇒ Electrical System; Rep. gr. 27 .
– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .
– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Pulsation dampener to exhaust gas turbocharger ⇒ Engine; Rep. gr. 21

3.6.6 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.4 TDI engine

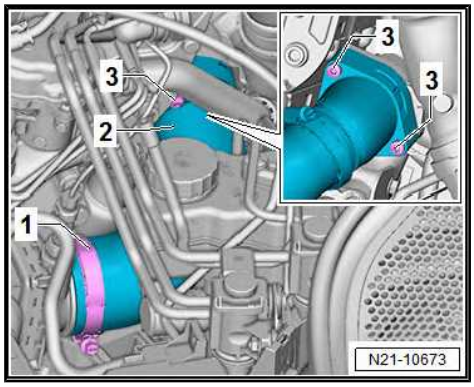
Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

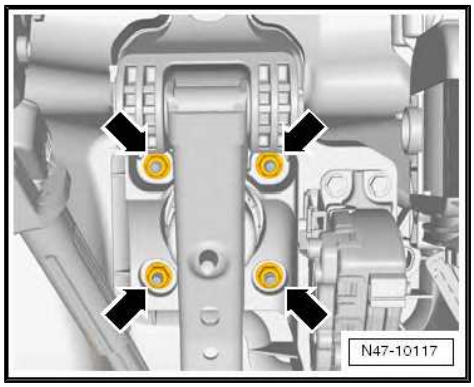
Removing

– Remove battery ⇒ Electrical System; Rep. gr. 27 .
– Remove master brake cylinder ⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .
– Loosen clamp -1- on the charge air hose of the exhaust gas turbocharger.
– Unscrew screws -3- and remove pulsation dampener -2- including charge air hose.
– Remove the engine control unit - J623- and lay the cable to the side ⇒ Engine; Rep. gr. 23 .
– Remove ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ “3.2.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , left -hand drive vehicles from 22/2015”, page 28 .
– Remove bracket for ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ “3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015”, page 21
– Disconnect vacuum line from the brake servo.



– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .
– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .
– Connect battery ⇒ Electrical System; Rep. gr. 27 .
– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .
– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

◆ ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
◆ ⇒ “3 Control unit and hydraulic unit”, page 15
◆ Pulsation dampener to exhaust gas turbocharger ⇒ Engine; Rep. gr. 21

3.6.7 Removing and installing brake servo, left-hand drive vehicles up to 21/2015, 1.6 TDI engine

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

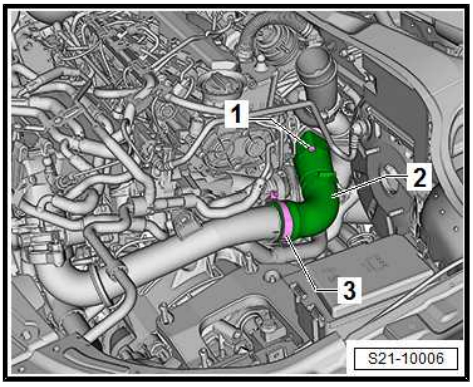
Removing

– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .

– Remove master brake cylinder
⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit
⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

– Remove bolts -1- for pulsation dampener.



Note

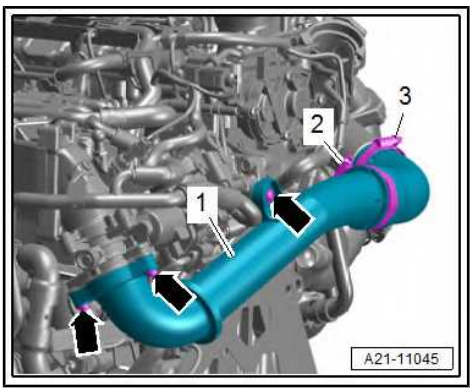
Only one screw -1- is visible in the figure; the other screw is located in the lower part.

– Remove screws -arrows-.

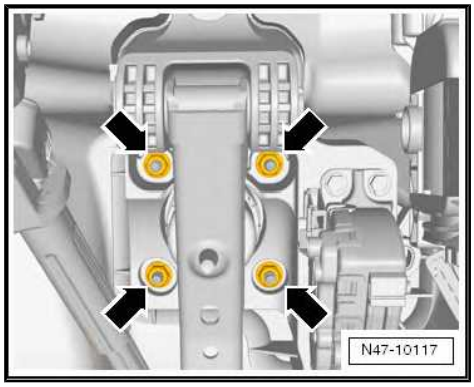
– Remove charge air pipe -1- including pulsation dampener.

– Pull the engine control unit - J623- out of the bracket and lay to the side ⇒ Engine; Rep. gr. 23 .

– Disconnect vacuum line from the brake servo.



– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Pulsation dampener to exhaust gas turbocharger ⇒ Engine; Rep. gr. 21

3.6.8 Removing and installing brake servo, left-hand drive vehicles from 22/2015, 1.6 TDI engine

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e. g. -VAS 5234-
- Extraction bottle (commercially available)

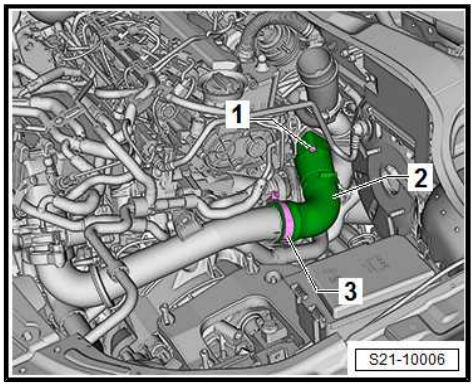
Removing

– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .

– Remove master brake cylinder ⇒ “3.5 Removing and installing master brake cylinder”, page 106 .

– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .

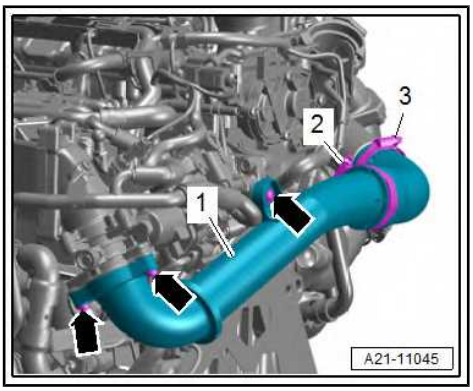
– Remove bolts -1- for pulsation dampener.



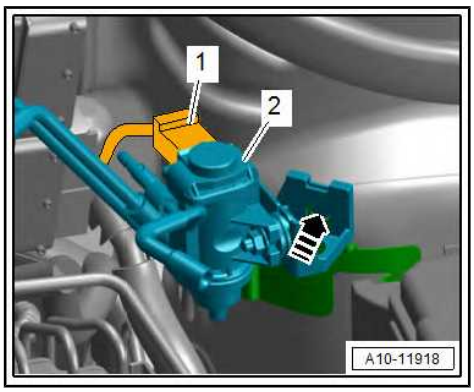
Note

Only one screw -1- is visible in the figure; the other screw is located in the lower part.

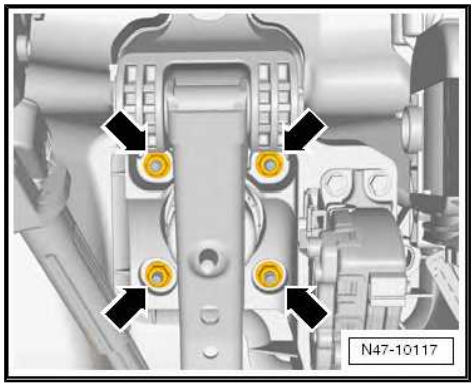
– Remove screws -arrows-.
– Remove charge air pipe -1- including pulsation dampener.



– Disconnect electrical plug connection -1- on the charge pressure control solenoid valve - N75- -2-.
– Unlock catch -arrow-, remove holder with solenoid valve and with connect vacuum lines upwards and place to side.
– Remove the engine control unit - J623- and lay the cable to the side ⇒ Engine; Rep. gr. 23 .
– Remove ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ “3.2.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 , left -hand drive vehicles from 22/2015”, page 28 .
– Remove bracket for ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ “3.1.4 Summary of components - control unit and hydraulic unit for ABS/ESC, right-hand drive vehicles from 22/2015”, page 21
– Disconnect vacuum line from the brake servo.



– Remove nuts for brake servo -arrows-.



Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Guide the brake servo unit towards the front.

Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.1 Summary of components - brake servo unit/master brake cylinder, left-hand drive vehicles”, page 101
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Pulsation dampener to exhaust gas turbocharger ⇒ Engine; Rep. gr. 21

3.6.9 Removing and installing brake servo, right-hand drive - diesel engines

Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e.g. -VAS 5234- .
- Extraction bottle (commercially available)
- Closing tool - T10249-
- Screw plug set - 1H0 698 311 A-
- Workshop crane - VAS 6100-

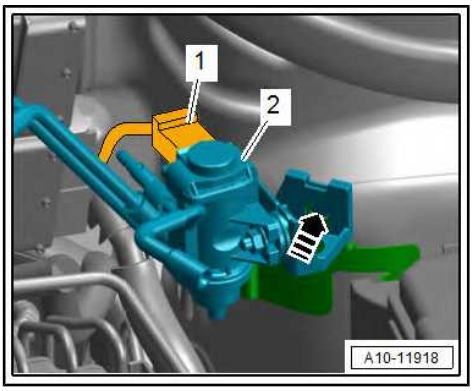
Removing

– Remove wiper arms ⇒ Electrical System; Rep. gr. 92 .

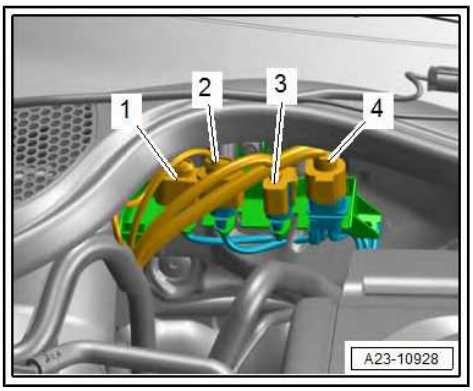
– Remove plenum chamber cover ⇒ Body Work; Rep. gr. 50 .

– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .

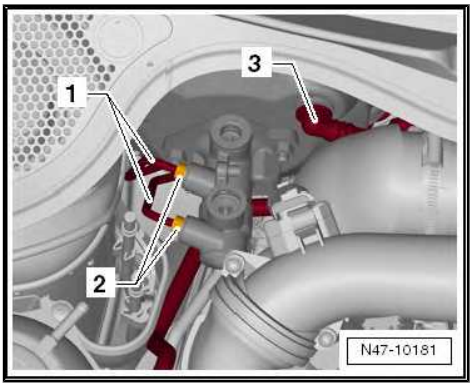
– Remove engine cover ⇒ Engine; Rep. gr. 10 .
– Remove air filter ⇒ Engine; Rep. gr. 23 .
– Disconnect electrical plug connection -1- on the charge pressure control solenoid valve - N75- -2-.
– Unlock catch -arrow-, remove holder with solenoid valve upwards and place to side.
– Remove the bracket for engine control unit - J623- with the control unit from the bulkhead plenum chamber and place to side with the cable.



– If present, open heat shield collar.
– Take plug connections -1- to -4- out of the bracket, disconnect and expose electric cables.
– Remove the connector holder from the bulkhead plenum chamber.

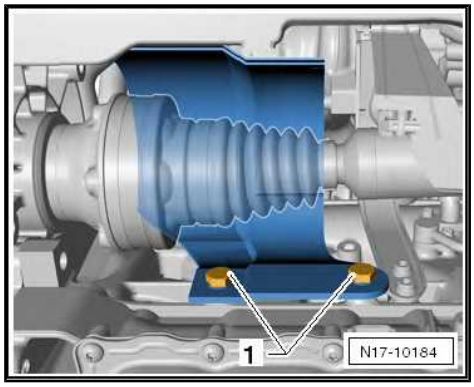


– Detach the vacuum line -3- from the brake servo.
– Disconnect the vacuum line from the bulkhead plenum chamber and from the charge air pipe and place to one side.
– Expose the wiring harness on the bulkhead plenum chamber.
– Remove noise insulation for bulkhead plenum chamber.
– Remove bulkhead plenum chamber ⇒ Body Work; Rep. gr. 50 .
– Remove windscreen wiper arms with linkage ⇒ Electrical System; Rep. gr. 92 .
– Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
– Remove pendulum support ⇒ Engine; Rep. gr. 10 .



– Remove bolts -1- and remove heat shield for right drive shaft, if present.

– Remove pre-exhaust pipe with exhaust gas cleaning module and lower as far as the assembly carrier ⇒ Engine; Rep. gr. 26 .



Note

- *The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - risk of damage.*
- *Do not bend the decoupling element by pulling it.*
- *Do not damage the wire mesh of the decoupling element.*

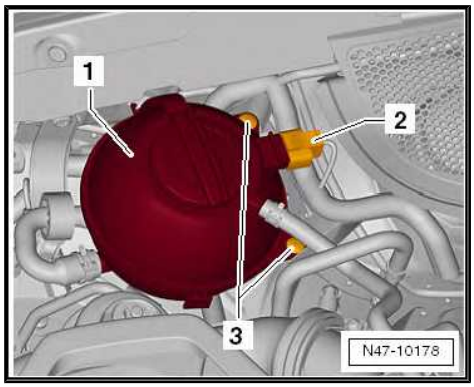
– Fit transport security - T10403- to the decoupling element of the pre-exhaust pipe.

– Secure the separated parts of the exhaust pipe at the underbody by inserting the clamping sleeve again.

– Disconnect connector -2-.

– Remove screws -3- and put the coolant expansion reservoir -1- with connected hoses to one side.

– Remove coolant expansion reservoir with connected hoses and place to one side ⇒ Engine; Rep. gr. 19 .



For vehicles with air conditioning

Note

Repairs may only be carried out in specialist service centres which have suitably trained personnel and are fitted out for working on the refrigerant circuit.

– Empty the refrigerant circuit with the aid of the A/C service station . Follow the notes ⇒ Heating, air conditioning; Rep. gr. 87 .

– Remove refrigerant lines from expansion valve ⇒ Heating, Air conditioning; Rep. gr. 87 .

Note

To prevent ingress of moisture, all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

– Unclip the refrigerant lines from the front wheelhouse and the frame side rail and place to the side.

Continued for all vehicles

– Lay sufficient non-fluffing cloths in the plenum chamber in the area underneath the master brake cylinder.

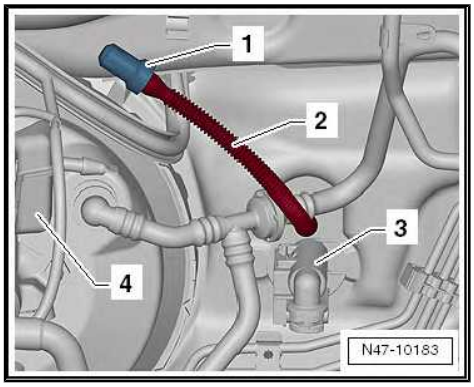
– Drain the brake fluid from the brake fluid reservoir using the brake filling and bleeding device e.g. -VAS 5234- .

For vehicles with manual gearbox

– Detach the hose -2- of the running-on line to the clutch master cylinder from the brake fluid reservoir -4-.

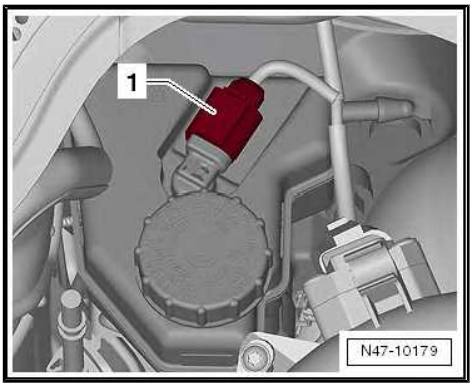
– Seal off the hole in the hose -2- using the closing tool - T10249--1-.

– Tie up hose -2-.



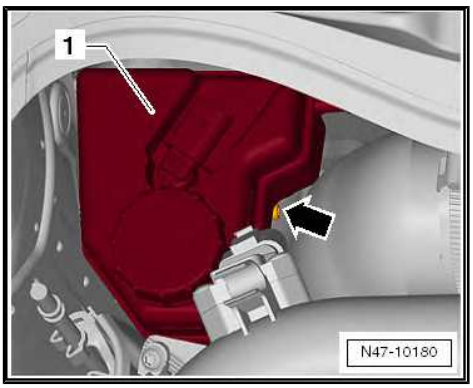
Continued for all vehicles

– Disconnect plug -1- from the brake fluid level warning contact - F34- .



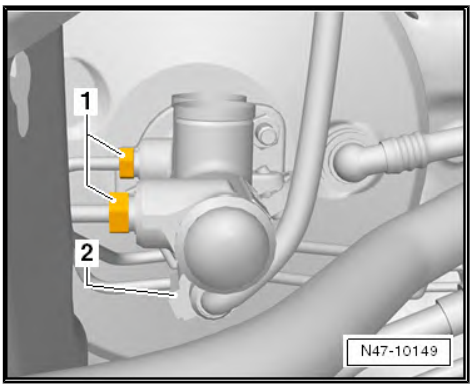
– Remove retaining screw for brake fluid reservoir-1- -arrow-.

– Pull the brake fluid reservoir carefully out of the plugs of the master brake cylinder.

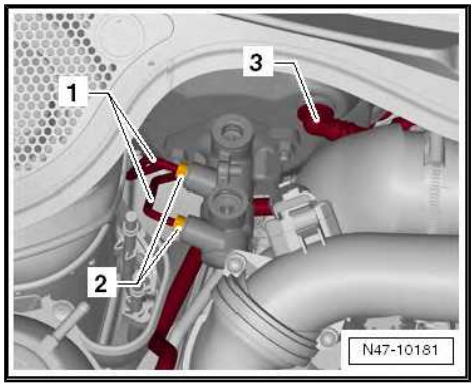


– Disconnect connector -2- from the brake light switch - F- .

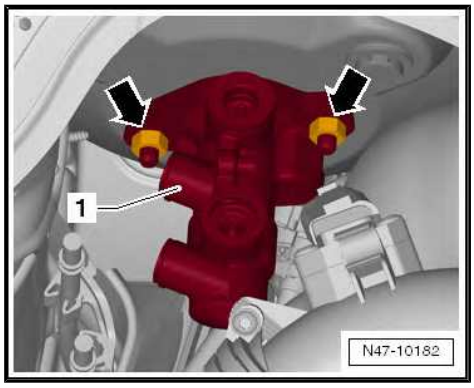
– Unclip the wiring harness from the brackets on the bulkhead and on the front wheelhouse and place to the side.



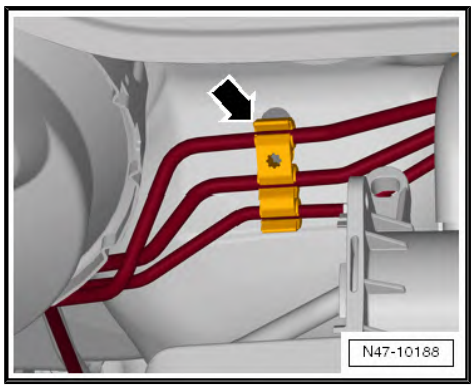
– Mark brake lines -1-.
– Remove brake lines -2- from the master brake cylinder and seal with blind plugs from the screw plug set - 1H0 698 311 A- .



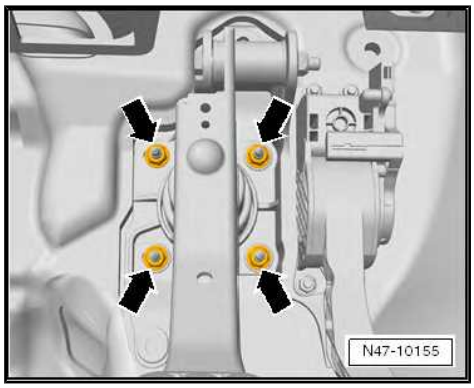
– Remove nuts for master brake cylinder -arrows-.
– Carefully pull off the master brake cylinder -1- from the brake servo unit.



– Unclip the brake lines from the bracket on the bulkhead -arrow-.
– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .



– Remove nuts for brake servo -arrows-.



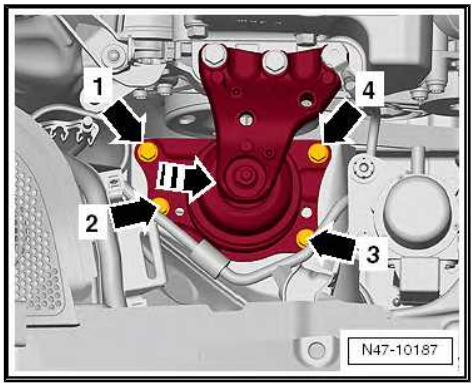
Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Remove bolts -1- to -4- for engine mounting.

– Use the workshop crane - VAS 6100- to move engine by approx. 3.5 cm in area of engine mount in -direction of arrow-.

– Remove brake servo.



Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch (vehicles fitted with manual gearbox) ⇒ Manual gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.2 Summary of components - brake servo unit/master brake cylinder, right-hand drive vehicles”, page 103
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Wiper arms ⇒ Electrical system; Rep. gr. 92 .
- Plenum chamber cover ⇒ Body Work; Rep. gr. 50 .
- Bulkhead plenum chamber ⇒ Body Work; Rep. gr. 50 .
- Air filter ⇒ Engine; Rep. gr. 23 .
- Wiper motor with linkage ⇒ Electrical system; Rep. gr. 92 .
- Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50
- Exhaust System ⇒ Engine; Rep. gr. 26
- Refrigerant lines ⇒ Heating, Air Conditioning; Rep. gr. 87
- Coolant expansion reservoir ⇒ Engine; Rep. gr. 19
- Engine mount and pendulum support ⇒ Engine; Rep. gr. 10 .

3.6.10 Removing and installing brake servo, right-hand drive - petrol engines

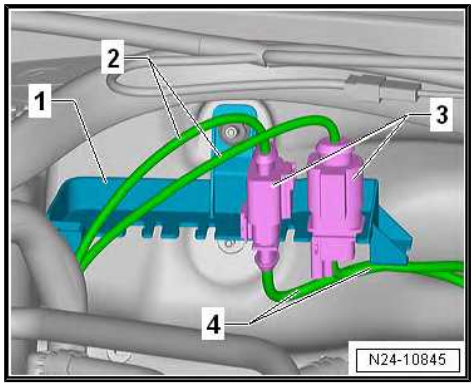
Special tools and workshop equipment required

- Release tool - T10159A- or -T10159B-
- Brake filling and bleeding device , e.g. -VAS 5234- .
- Extraction bottle (commercially available)
- Closing tool - T10249-
- Screw plug set - 1H0 698 311 A-

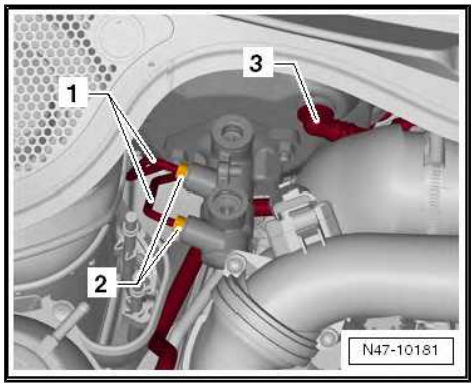
♦ Workshop crane - VAS 6100-

Removing

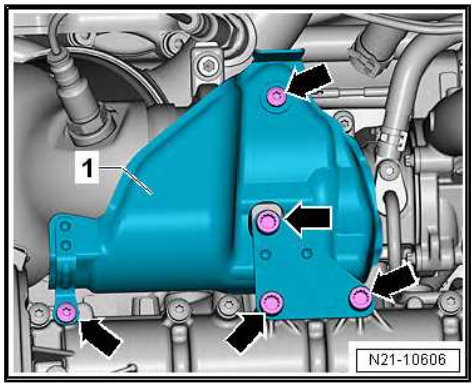
– Remove wiper arms ⇒ Electrical System; Rep. gr. 92 .
– Remove plenum chamber cover ⇒ Body Work; Rep. gr. 50 .
– Disconnect battery ⇒ Electrical System; Rep. gr. 27 .
– Remove engine cover ⇒ Engine; Rep. gr. 10 .
– Remove the bracket for engine control unit - J623- with the control unit from the bulkhead plenum chamber and place to side with the cable.
– If present, open heat shield collar.
– Take plug connections -3- out of the bracket -1-, disconnect and expose electric cables.
– Remove the bracket -1- from the bulkhead plenum chamber.



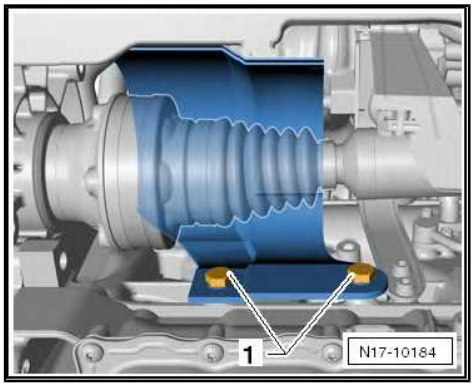
– Detach the vacuum line -3- from the brake servo.
– Disconnect the vacuum line from the bulkhead plenum chamber and from the charge air pipe and place to one side.
– Expose the wiring harness on the bulkhead plenum chamber.
– Remove noise insulation for bulkhead plenum chamber.
– Remove bulkhead plenum chamber ⇒ Body Work; Rep. gr. 50 .
– Remove windscreen wiper arms with linkage ⇒ Electrical System; Rep. gr. 92 .
– Remove lambda probe 1 upstream of catalytic converter - GX10- ⇒ Engine; Rep. gr. 26 .
– Remove securing bolts for the coolant lines of the exhaust gas turbocharger on the cylinder head cover.



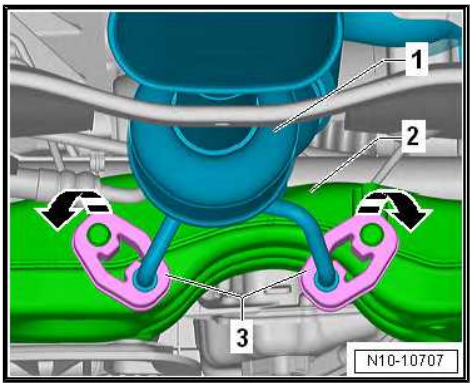
– Remove screws -arrows-.
– Detach cable for lambda probe 1 after catalytic converter - GX7- from heat shield -1- and remove heat shield.
– Remove pre-exhaust pipe with catalytic converter from exhaust gas turbocharger ⇒ Engine; Rep. gr. 26 .
– Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
– Remove pendulum support ⇒ Engine; Rep. gr. 10 .



– Remove bolts -1- and remove heat shield for right drive shaft, if present.



– Remove pre-exhaust pipe with catalytic converter from bracket on cylinder block ⇒ Engine; Rep. gr. 26 .



Note

- *The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - risk of damage.*
- *Do not bend the decoupling element by pulling it.*
- *Do not damage the wire mesh of the decoupling element.*

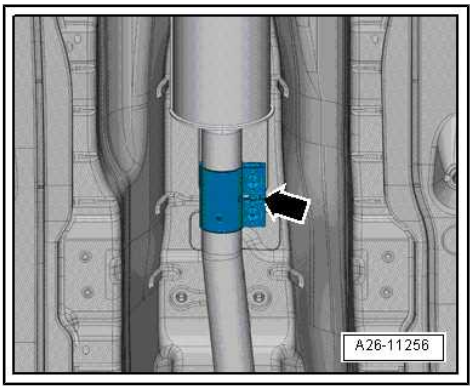
– Fit transport security - T10403- to the decoupling element of the pre-exhaust pipe.

– Unclip retaining straps -3- for pre-exhaust pipe with catalytic converter -1- from the assembly carrier -2- in direction of -arrows-.

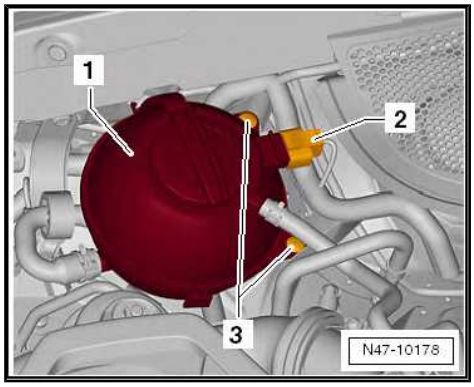
– Loosen the clamping sleeve -arrow- and slide it backwards.

– Lower pre-exhaust pipe as far as the assembly carrier.

– Secure the separated parts of the exhaust pipe at the underbody by inserting the clamping sleeve again.



– Disconnect connector -2-.
– Remove screws -3- and put the coolant expansion reservoir -1- with connected hoses to one side.
– Remove coolant expansion reservoir with connected hoses and place to one side ⇒ Engine; Rep. gr. 19 .



For vehicles with air conditioning

Note

Repairs may only be carried out in specialist service centres which have suitably trained personnel and are fitted out for working on the refrigerant circuit.

– Empty the refrigerant circuit with the aid of the A/C service station . Follow the notes ⇒ Heating, air conditioning; Rep. gr. 87 .
– Remove refrigerant lines from expansion valve ⇒ Heating, Air conditioning; Rep. gr. 87 .

Note

To prevent ingress of moisture, all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

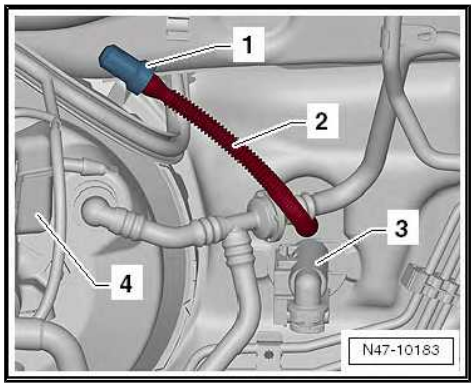
– Unclip the refrigerant lines from the front wheelhouse and the frame side rail and place to the side.

Continued for all vehicles

– Lay sufficient non-fluffing cloths in the plenum chamber in the area underneath the master brake cylinder.
– Drain the brake fluid from the brake fluid reservoir using the brake filling and bleeding device e.g. -VAS 5234- .

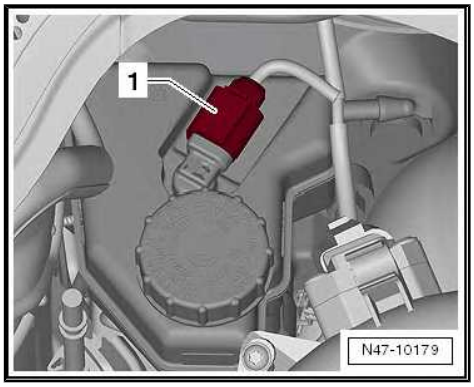
For vehicles with manual gearbox

– Detach the hose -2- of the running-on line to the clutch master cylinder from the brake fluid reservoir -4-.
– Seal off the hole in the hose -2- using the closing tool - T10249--1-.
– Tie up hose -2-.

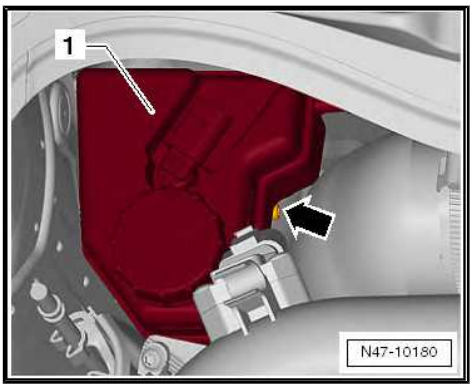


Continued for all vehicles

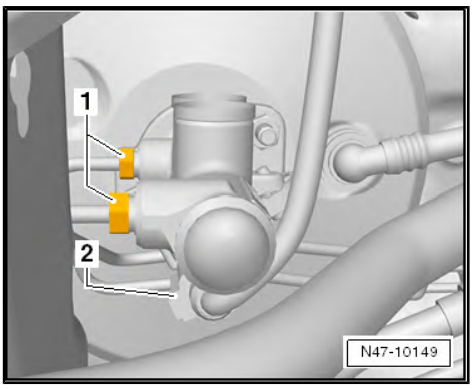
– Disconnect plug -1- from the brake fluid level warning contact - F34- .



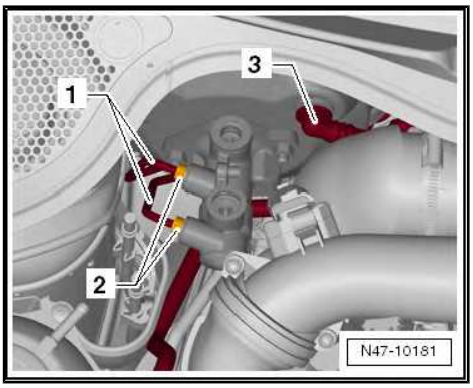
– Remove retaining screw for brake fluid reservoir-1- -arrow-.
– Pull the brake fluid reservoir carefully out of the plugs of the master brake cylinder.



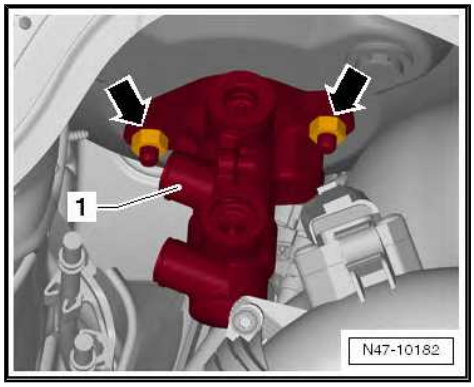
– Disconnect connector -2- from the brake light switch - F- .
– Unclip the wiring harness from the brackets on the bulkhead and on the front wheelhouse and place to the side.



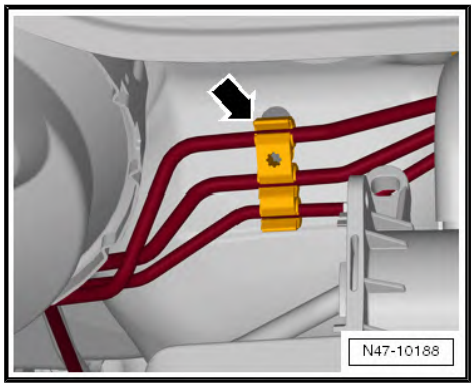
– Mark brake lines -1-.
– Remove brake lines -2- from the master brake cylinder and seal with blind plugs from the screw plug set - 1H0 698 311 A- .



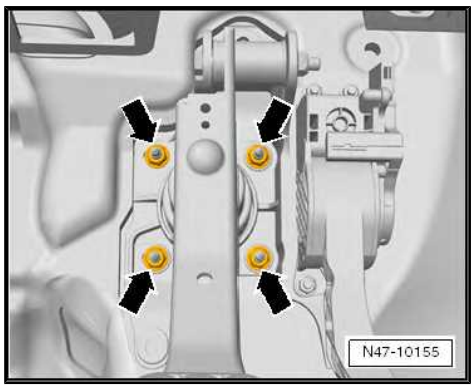
– Remove nuts for master brake cylinder -arrows-.
– Carefully pull off the master brake cylinder -1- from the brake servo unit.



– Unclip the brake lines from the bracket on the bulkhead -arrow-.
– Separating the brake pedal from the brake servo unit ⇒ “4.3 Separating brake pedal from brake servo”, page 87 .



– Remove nuts for brake servo -arrows-.



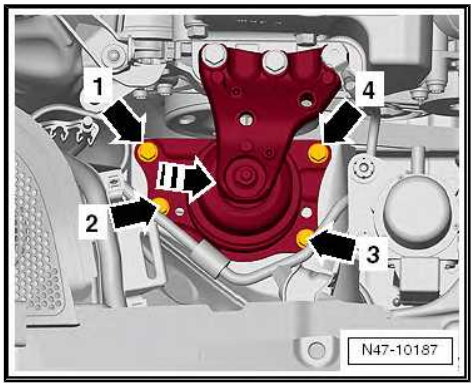
Note

The brake servo unit for vehicles with C-EPS steering is only fixed with two nuts.

– Remove bolts -1- to -4- for engine mounting.

– Use the workshop crane - VAS 6100- to move engine by approx. 3.5 cm in area of engine mount in -direction of arrow-.

– Remove brake servo.



Installing

Installation is performed in the reverse order; pay attention to the following points:

- Install new gasket ring between the master brake cylinder and the brake servo unit.
- When installing the master brake cylinder with the brake servo unit pay attention to the correct positioning of the pressure rod in the master brake cylinder.
- Before installing the brake fluid reservoir in the master brake cylinder, wet the seal with brake fluid.
- Only fill up with new brake fluid.

– Clip the brake pedal onto the brake servo ⇒ “4.4 Clipping the brake pedal onto the brake servo unit”, page 88 .

– Fill up with new brake fluid ⇒ “3.1.4 Brake fluid”, page 4 .

– Connect battery ⇒ Electrical System; Rep. gr. 27 .

– Bleed brake system ⇒ “6 Hydraulic system”, page 152 .

– Bleed clutch ⇒ Gearbox; Rep. gr. 30 .

Tightening torques

- ⇒ “3.1.2 Summary of components - brake servo unit/master brake cylinder, right-hand drive vehicles”, page 103
- ⇒ “3 Control unit and hydraulic unit”, page 15
- Wiper arms ⇒ Electrical system; Rep. gr. 92 .
- Plenum chamber cover ⇒ Body Work; Rep. gr. 50 .
- Bulkhead plenum chamber ⇒ Body Work; Rep. gr. 50 .
- Air filter ⇒ Engine; Rep. gr. 23 .
- Wiper motor with linkage ⇒ Electrical system; Rep. gr. 92 .
- Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50
- Exhaust System ⇒ Engine; Rep. gr. 26
- Heat shield ⇒ Engine; Rep. gr. 21
- Lambda probe 1 upstream of catalytic converter - GX10- ⇒ Engine; Rep. gr. 24
- Refrigerant lines ⇒ Heating, Air Conditioning; Rep. gr. 87
- Coolant expansion reservoir ⇒ Engine; Rep. gr. 19
- Engine mount and pendulum support ⇒ Engine; Rep. gr. 10 .

4 Vacuum system

⇒ “4.1 Exploded view – vacuum pump”, page 138

⇒ “4.2 Checking the non-return valve”, page 140

⇒ “4.3 Checking the vacuum system”, page 140

⇒ “4.4 Connecting vacuum gauge for brake servo VAS 6721 ”, page 140

⇒ “4.5 Checking vacuum generation”, page 141

⇒ “4.6 Checking for leaks”, page 142

⇒ “4.7 Vacuum generation with manual vacuum pump VAS 6213 ”, page 143

⇒ “4.8 Removing and installing the pressure sensor for the brake servo unit”, page 144

⇒ “4.9 Removing and installing vacuum sensor G608 ”, page 144

⇒ “4.10 Removing and installing electric vacuum pump”, page 145

4.1 Exploded view – vacuum pump

⇒ “4.1.1 Summary of components - vacuum pump, vehicles with petrol engines”, page 138

⇒ “4.1.2 Summary of components - vacuum pump, vehicles with gasoline engines, 1.0 TSI engine”, page 138

⇒ “4.1.3 Summary of components - vacuum pump, vehicles with diesel engines”, page 139

4.1.1 Summary of components - vacuum pump, vehicles with petrol engines

on petrol engines the required negative pressure is drawn from the intake manifold

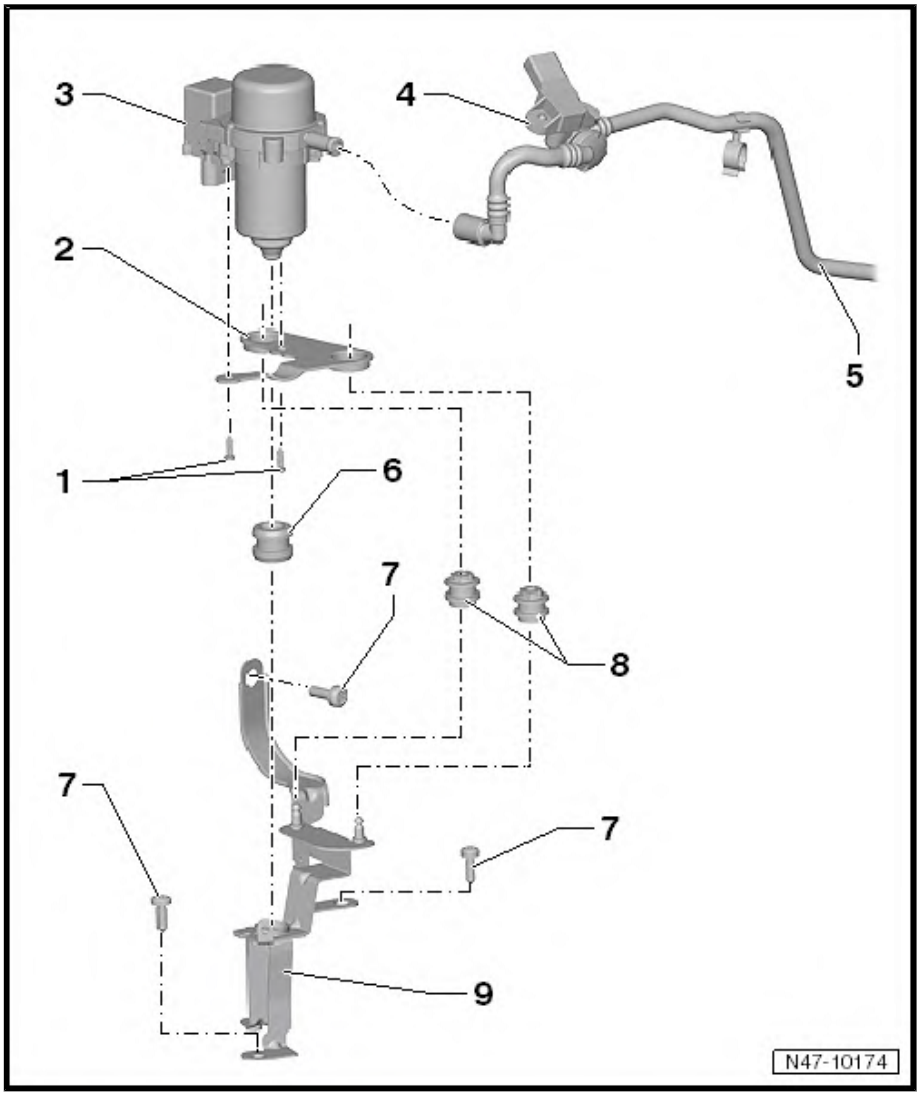
Vehicles with 1.0 l TSI engines are fitted with the electric vacuum pump: removing and installing
⇒ “4.10 Removing and installing electric vacuum pump”, page 145 .

Check electrical vacuum pump is working ⇒ Vehicle diagnostic tester.

4.1.2 Summary of components - vacuum pump, vehicles with gasoline engines, 1.0 TSI engine

Note

- *Vacuum pump for brake - V192- cannot be repaired. If the Vacuum pump for brake - V192- fails, it must be replaced.*
- *The brake vacuum pump - V192- is located on the right in the engine compartment.*



1 - Screw

- ❑ 8 Nm

2 - Mounting bracket

3 - Vacuum pump for brake - V192-

- ❑ Removing and installing ⇒ “4.10 Removing and installing electric vacuum pump”, page 145

4 - Pressure sensor for the brake servo unit - G294-

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts
- ❑ only on vehicles equipped with automatic gearbox
- ❑ Removing and installing ⇒ “4.8 Removing and installing the pressure sensor for the brake servo unit”, page 144

5 - Vacuum line

6 - Rubber bearing

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

7 - Screw

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts
- ❑ 20 Nm

8 - Rubber bearing

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

9 - Mounting bracket

- ❑ Assignment ⇒ Electronic Catalogue of Original Parts

4.1.3 Summary of components - vacuum pump, vehicles with diesel engines

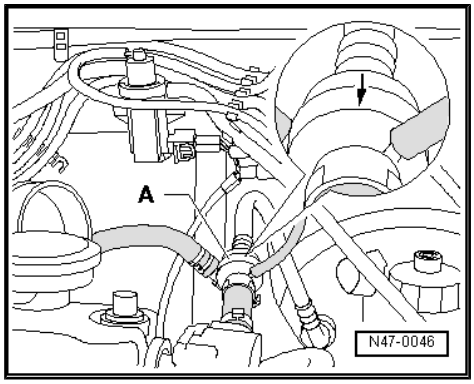
The vacuum supply to the brake servo on vehicles with turbocharged engines is provided by a vacuum pump which is part of the oil pump ⇒ Engine; Rep. gr. 17 ; Oil sump/Remove and install oil pump .

4.2 Checking the non-return valve

– Air must pass through non-return valve -A- in direction of arrow.

– Non-return valve must remain closed in opposite direction.

Pay attention to correct installation position.



4.3 Checking the vacuum system

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

This check relates to the following components:

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

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

Take note of the following test requirements:

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

4.4 Connecting vacuum gauge for brake servo - VAS 6721-

Special tools and workshop equipment required

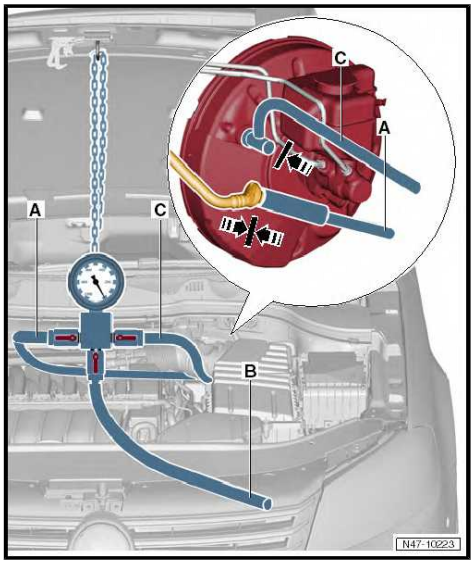
- Vacuum gauge for brake servo - VAS 6721-

– Pull vacuum hose out of brake servo.

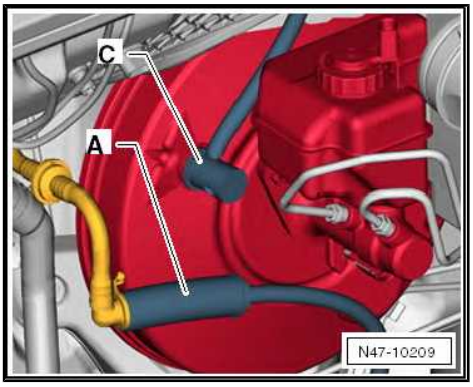
First press the brake pedal several times in order to facilitate removal of the vacuum hose.

– Place brake servo vacuum gauge - VAS 6721- in between.

Item number	Component	Meaning
A	Cut-off valve	In direction of vacuum hose, non-return valve and, if included, vacuum pump
B	Cut-off valve	♦ Open to facilitate removal of brake servo vacuum gauge - VAS 6721- ♦ Open to simulate a fault source ♦ Connection of manual vacuum pump - VAS 6213-
C	Cut-off valve	In direction of brake servo



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



4.5 Checking vacuum generation

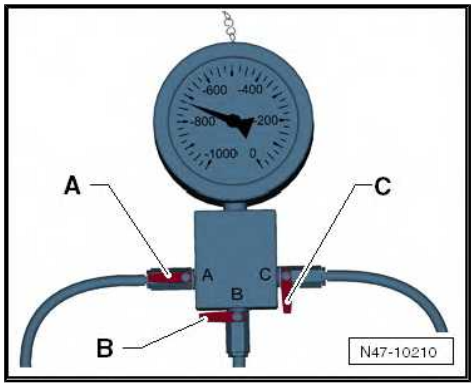
The average air pressure of the earth's atmosphere at sea level is 1013 mbar and decreases steeply as the altitude increases (approx. 100 mbar/1,000 m altitude). Local and time variations also influence the vacuum generation.

A cold engine, a switched-on air-conditioning system as well as engine idling have an adverse influence on generation of a vacuum.

– Before starting work, check all vacuum hoses for damage (e.g. cracks or marten bite) and to check that they are correctly and firmly attached

– Place vacuum gauge for brake servo - VAS 6721- in between ⇒ “4.4 Connecting vacuum gauge for brake servo VAS 6721 ”, page 140 .

– Open locking valve -A-.
– Close cut-off valves -B- and -C-.
– Start warm engine (>60° C), press accelerator briefly (engine speed greater than 2000/min).
– Read indicated measured value.



Normally (see notes), the vacuum that is generated should be between 700 and 950 mbar (depending on engine size).

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

– For comparison purposes, generate the vacuum with the manual vacuum pump - VAS 6213-
⇒ “4.7 Vacuum generation with manual vacuum pump VAS 6213 ”, page 143 .

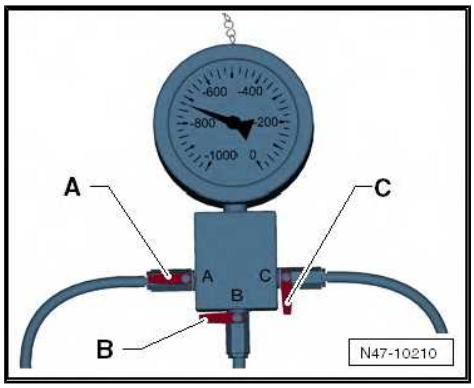
Open cut-off valve -B- to facilitate removal of hose connections and adapter.

4.6 Checking for leaks

The average air pressure of the earth's atmosphere at sea level is 1013 mbar and decreases steeply as the altitude increases (approx. 100 mbar/1,000 m altitude). Local and time fluctuations also influence vacuum generation.

A cold engine, a switched-on air-conditioning system as well as engine idling have an adverse influence on generation of a vacuum.

– Before starting work, check all vacuum hoses for damage (e.g. cracks or marten bite) and to check that they are correctly and firmly attached
– Place vacuum gauge for brake servo - VAS 6721- in between
⇒ “4.4 Connecting vacuum gauge for brake servo VAS 6721 ”, page 140 .
– Open locking valve -A-.
– Close cut-off valves -B- and -C-.
– Start warm engine (>60° C), press accelerator briefly (engine speed greater than 2000/min).



Normally (see notes), the vacuum that is generated should be between 700 and 950 mbar (depending on engine size).

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

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

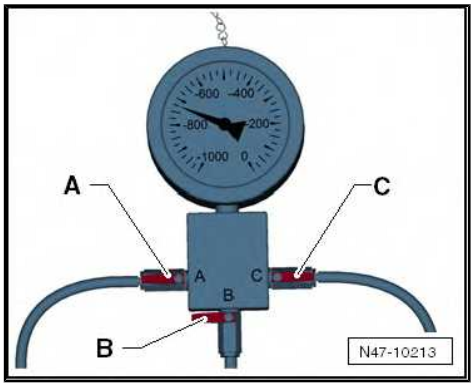
If the vacuum decrease is greater, then check for leaks in the vicinity of:

1 - Brake servo

or

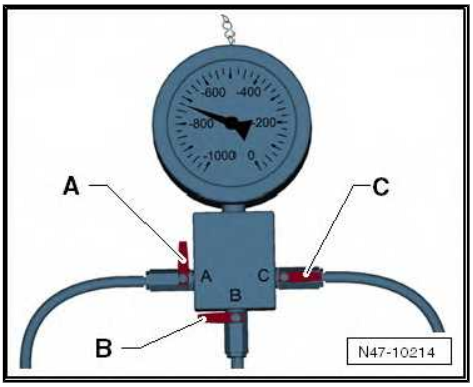
2 - Non-return valve, vacuum hoses with connectors and vacuum pump/intake manifold.

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



Vacuum check in vicinity of brake servo

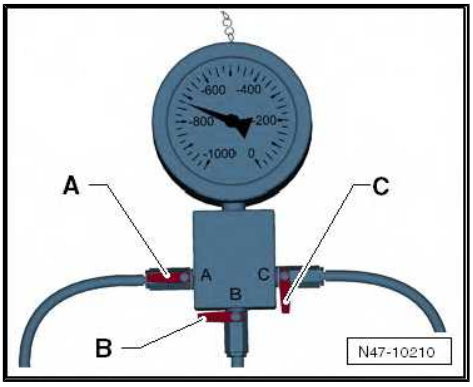
– After generation of vacuum, close cut-off valve -A- in order to check brake servo vacuum system.



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

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

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



4.7 Vacuum generation with manual vacuum pump - VAS 6213-

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

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

4.8 Removing and installing the pressure sensor for the brake servo unit

Note

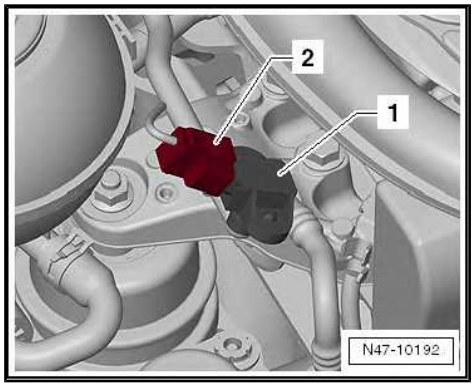
Only for vehicles with automatic gearbox

Removing

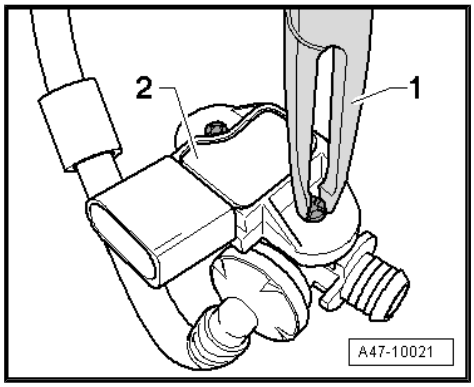
Note

The vacuum line must not be removed.

– Disconnect the plug -2- from the pressure sensor for the brake servo unit - G294- -1-.



– Release the catches with pliers -1-.
– Carefully lever out the pressure sensor for brake booster - G294- -2-.



Installing

Installation is performed in the reverse order; pay attention to the following points:

– Carefully connect the pressure sensor for brake booster - G294- to the vacuum line.

4.9 Removing and installing vacuum sensor - G608-

Note

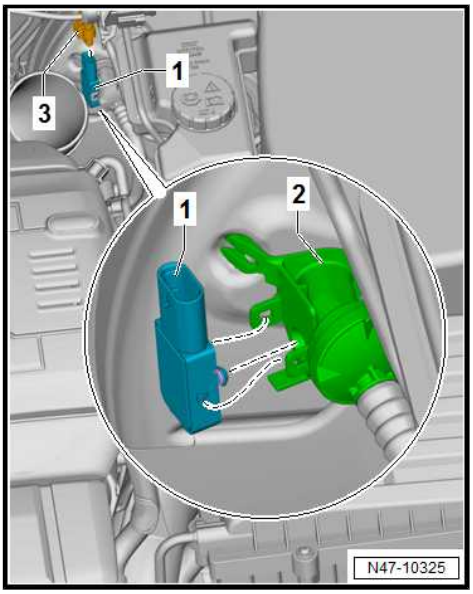
- *The vacuum sender - G608- is only installed with some petrol engines.*
- *The vacuum encoder - G608- Is on the vacuum hose from the intake manifold to the brake booster.*
- *The exact location of the vacuum encoder - G608- on the vacuum hose differs depending on the engine version.*

Removing

– Disconnect plug -3- for vacuum sensor - G608- -1-.

– Pull vacuum hose out of brake servo.

– Carefully lever the vacuum sender - G608- -1- out of the vacuum line -2-.



Installing

Installation is carried out in the reverse order.

4.10 Removing and installing electric vacuum pump

Note

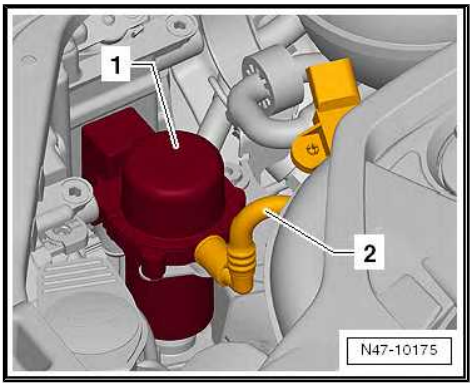
- *Vacuum pump for brake - V192- cannot be repaired. If the Vacuum pump for brake - V192- fails, it must be replaced.*
- *The brake vacuum pump - V192- is located on the right in the engine compartment.*

Removing

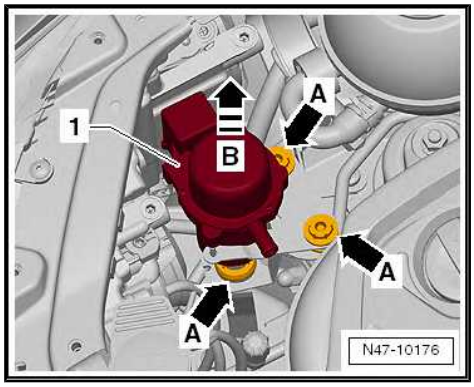
NOTICE

Do not damage the vacuum hose. Replace if damaged.

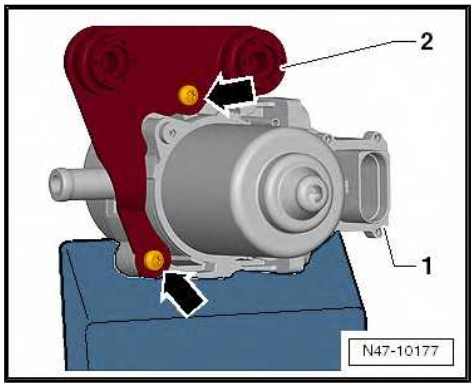
– Remove the vacuum hose -2- from the brake vacuum pump - V192- -1-.



– Pull out the vacuum pump for brake - V192- together with the mounting bracket in the direction of -arrow B-. and put to one side.
– Disconnect the plug connection of the brake vacuum pump - V192- .



– Remove the screws -arrows- and separate the bracket -2- from the vacuum pump for brake - V192- -1-.



Installing

Installation is performed in the reverse order; pay attention to the following points:

Note

Ensure that the vacuum pump for brake - V192- is fitted correctly.

Tightening torques

- ⇒ “4.1.2 Summary of components - vacuum pump, vehicles with gasoline engines, 1.0 TSI engine”, page 138

5 Brake lines

⇒ “5.1 Repairing brake lines”, page 147

5.1 Repairing brake lines

⇒ “5.1.1 Assembly overview - Flaring tool”, page 147

⇒ “5.1.2 Work instruction”, page 148

5.1.1 Assembly overview - Flaring tool

List of individual tools

1 - Flaring tool - VAS 6056/1-

- ❑ The flaring chucks - VAS 6056/6- are included in the flaring tool - VAS 6056/1-

2 - Pipe cutter - VAS 6056/2-

3 - Brake line-peeler - VAS 6056/3-

- ❑ The grub screws (in the shank and sideways) are adjusted and must not be altered!

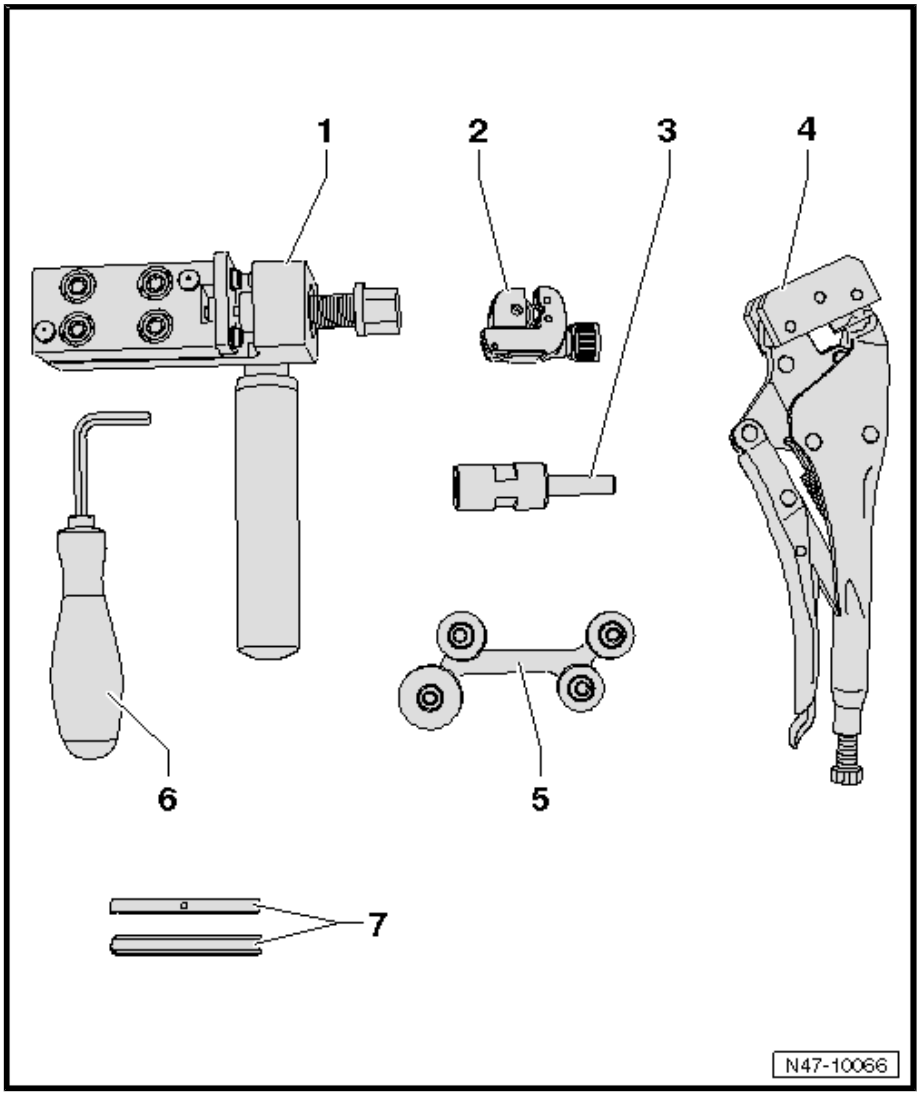
4 - Gripping pliers with plastic chuck jaws - VAS 6056/4-

5 - Pipe bending tool - VAS 6056/5-

6 - Screwdriver SW6

- ❑ Short

7 - Flaring chucks - VAS 6056/7-



Assembly overview - Flaring tool

1 - Flaring tool upper part

- ❑ unscrew for changing the flaring chucks

2 - Attachment for door handle

- ❑ must be unscrewed to access securing bolt for upper part

3 - Fixing screw

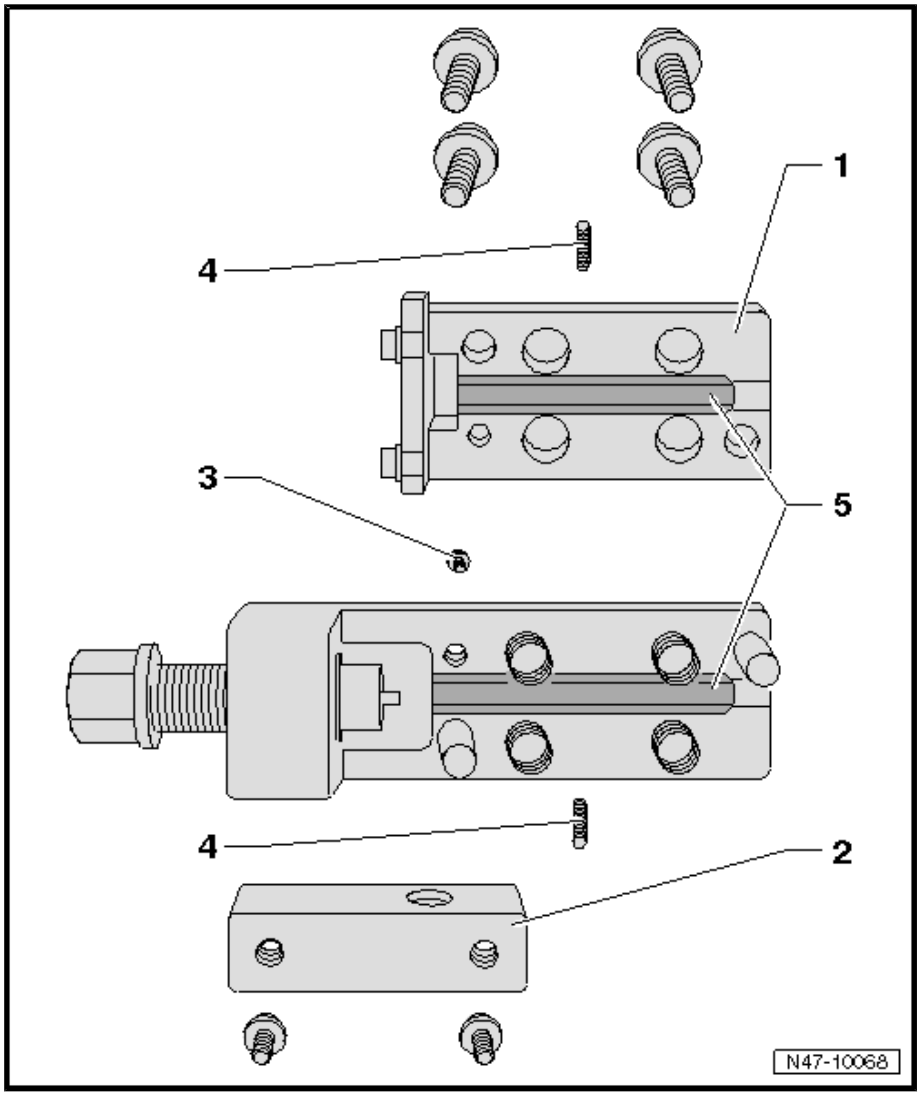
- ❑ For flanging tool upper part

4 - Grub screws for flaring chucks

- ❑ For centring and holding the flaring chucks
- ❑ 2 mm hexagon socket

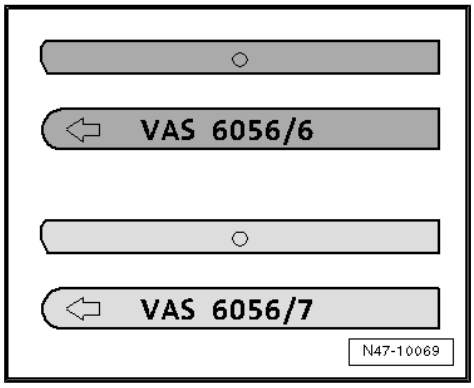
5 - Flaring chucks

- ❑ Various
- ❑ Assembly instructions ⇒ Fig. ""Mounting instruction for flaring chucks:"" , page 148



Mounting instruction for flaring chucks:

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



Note

The arrow, on the rounded side of the flaring chucks, must point to the housing edge and the straight side of the flaring chucks must be installed to the spindle, otherwise the flaring head is not properly formed.

5.1.2 Work instruction

Special tools and workshop equipment required

- ♦ Brake line flaring tool - VAS 6056-
- ♦ Brake filling and bleeding device - VAS 5234-

NOTICE

- **Brake fluid must never come into contact with fluids containing mineral oils (oil, petrol, cleaning agent, because the fluids damage the sealing rings and boots of the brake system.**
- **Because of its caustic effect, the brake fluid must not come into contact with paint.**
- **Observe the applicable disposal instructions.**
- **Only use new brake fluid.**

WARNING

Brake fluid is toxic and must never be sucked through a hose by mouth.

Note

- *Brake lines must only be bent max. 90°, otherwise they kink or present deformations, which constrain the line cross-section in an unauthorized manner.*
- *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 and only clean with methylated spirits.*
- *The arrow, on the rounded side of the flaring chucks, must point to the housing edge. The straight sides of the flaring chucks must be installed facing the spindle, otherwise the flaring head is not correctly positioned.*

Using the brake line flaring tool - VAS 6056- , the brake lines can be crimped with a pipe outside diameter of 5 mm, without damaging the coating. So that in certain cases parts of the brake lines can be replaced cheaply.

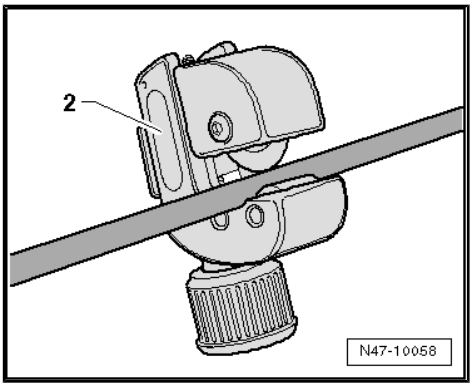
Separate

– Unscrew the affected brake line on the brake caliper or wheel-brake cylinder, while doing so collect escaping brake fluid and dispose according to the specifications.

– Cut through the brake line in a suitable location (straight, freely accessible piece) with the pipe cutter -2-.

– Remove the part to be replaced.

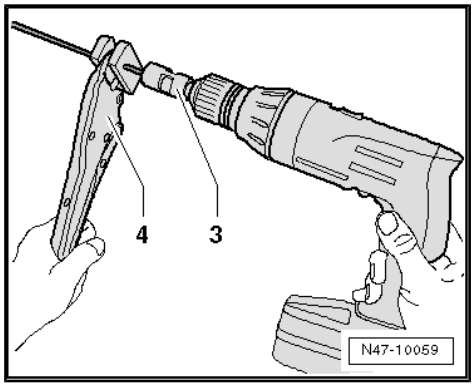
– Degrease the surface of the brake line.



– Clamp the brake line in the gripping pliers -4- tight enough, so that it protrudes approx. 50 mm out of the plastic chuck jaws.
– Tension the peeler -3- in a boring machine and place it onto the brake line.
– Peel off the coating of the brake line using the slower speed of the boring machine and by exerting a slight pressure against the brake line.

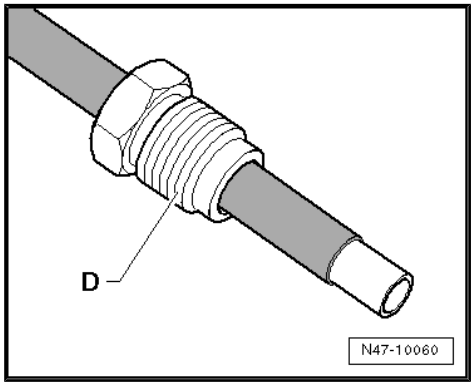
The length of the peeling is determined by the stop in the peeler.

– Separate the peeler from the brake line and remove peel residues.
– Remove gripping pliers.

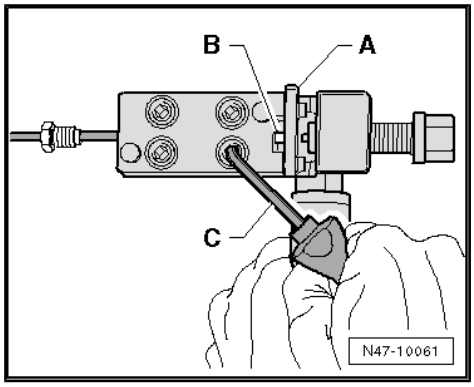


Crimping

– Slide pipe screw -D- onto the brake line.



– Push the brake line -B- against the stop -A- in the flaring tool.

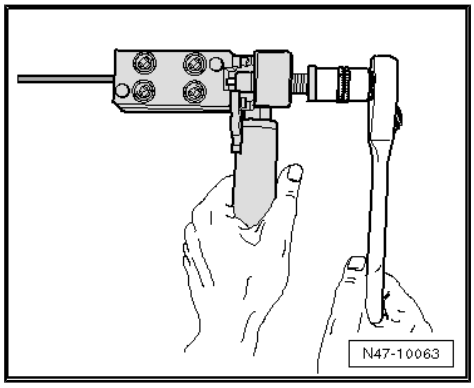


Note

When tightening the Allen screws the brake line must lie against the stop, otherwise the flaring head does not function properly.

– Pre-tension the brake line in the flaring tool so that the brake line can no longer be moved. Fold up the stop -A- and then tighten the Allen screws crosswise completely with the offset screwdriver -C-.

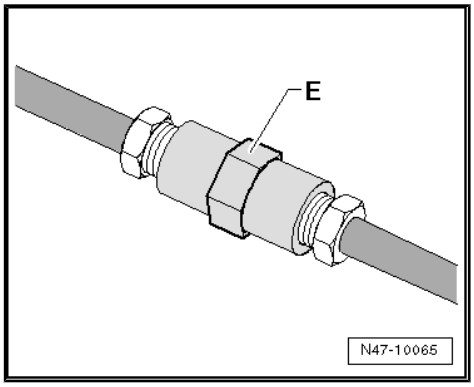
– Turn the spindle in the flaring tool up to the stop.
– Turn back the spindle once again.
– Loosen the Allan screws crosswise.
– Take the brake line out of the flaring tool, clean and check the brake line as well as the flaring head.



Briefly flush the part of the brake line still in the vehicle:

– Connect the brake filling and bleeding device - VAS 5234- , fit the hose of the bleeding bottle onto the flaring head of the brake line and allow the brake filling and bleeding device - VAS 5234- to run briefly until some brake fluid has passed through.
– Purge the brake line that you will be fitting with compressed air.

– Assemble the brake lines together with the connecting piece -E-.
– Install brake line.
– Bleeding Brake System
⇒ “6.3 Bleeding hydraulic system following standard procedure”, page 153



6 Hydraulic system

⇒ “6.1 General notes on brake fluid”, page 152

⇒ “6.2 Prebleeding the hydraulic system”, page 152

⇒ “6.3 Bleeding hydraulic system following standard procedure”, page 153

⇒ “6.4 Subsequent bleeding of hydraulic system”, page 154

⇒ “6.5 Testing leak-tightness”, page 155

6.1 General notes on brake fluid

- The brake fluid is hygroscopic, i.e. it retains humidity from the ambient air, and must therefore always be stored in airtight containers.
- Brake fluid must never come into contact with fluids containing mineral oils (oil, petrol, cleaning agent). Mineral oils damage the plugs and boots of the brake system.
- Drained (used) brake fluid must never be used again.
- The brake fluid is toxic, avoid skin contact.
- Because of its caustic effect, the brake fluid must not come into contact with paint.
- Rinse off spilled brake fluid using plenty of water.
- Dispose of brake fluid in compliance with the applicable waste disposal and environmental regulations.
- Only use new brake fluid in accordance with the specification ⇒ “3.1.4 Brake fluid”, page 4 .

6.2 Prebleeding the hydraulic system

Special tools and workshop equipment required

- Brake filling and bleeding device , e. g. - VAS 5234-
- Brake fluid

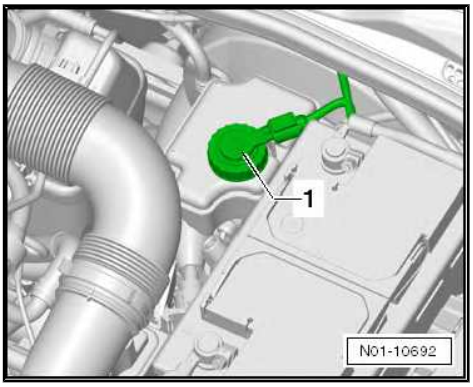
Note

For vehicles with EDL/TCS, or with EDL/TCS/ESC, if one chamber of the brake fluid return tank has run dry e.g. due to a leak, the system must be bled first.

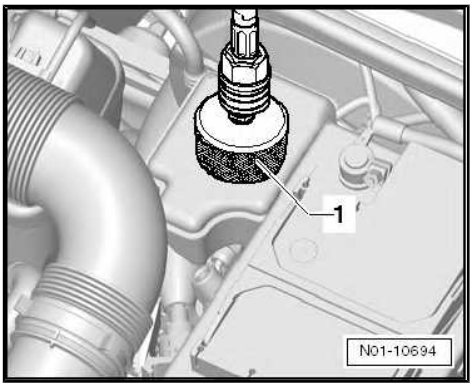
– Note the general instructions on brake fluid ⇒ “6.1 General notes on brake fluid”, page 152 .

A pre-pressure of 0,2 MPa (2 bar) is required to bleed the brake system.

– Unscrew cap -1- from the brake fluid reservoir



– Connect the thread plug -1- of the brake filling and bleeding device e.g. -VAS 5234- to the brake fluid reservoir.



– Provide a suitable catch pan for used brake fluid.

1. Bleed the front left and front right brake calipers at the same time.
2. Bleed the rear left and rear right brake calipers/cylinders at the same time.

– Allow brake fluid to drain until even the smallest air bubbles have escaped.

– Initiate basic setting ⇒ Vehicle diagnostic tester.

– Then perform normal bleeding
⇒ “6.3 Bleeding hydraulic system following standard procedure”, page 153 .

6.3 Bleeding hydraulic system following standard procedure

Special tools and workshop equipment required

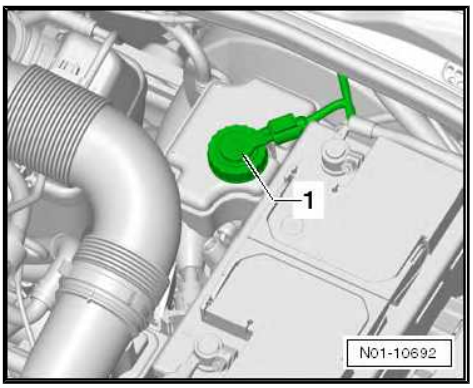
♦ Brake filling and bleeding device , e. g. - VAS 5234-

♦ Brake fluid

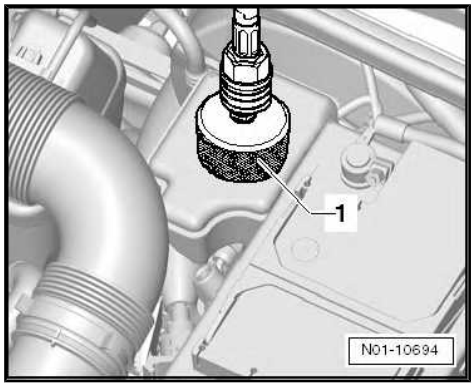
– Note the general instructions on brake fluid
⇒ “6.1 General notes on brake fluid”, page 152 .

A pre-pressure of 0,2 MPa (2 bar) is required to bleed the brake system.

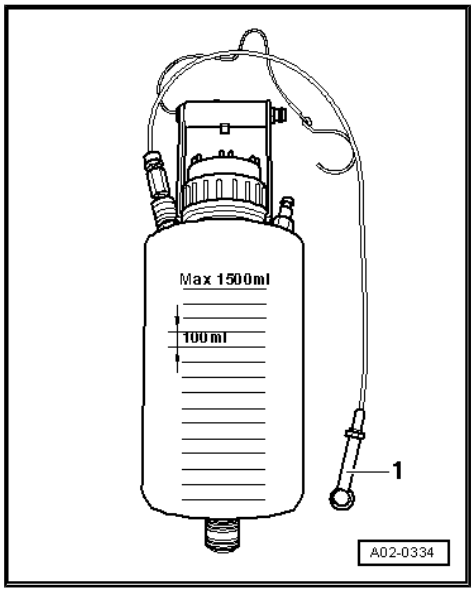
– Unscrew cap -1- from the brake fluid reservoir



– Connect the thread plug -1- of the brake filling and bleeding device e.g. -VAS 5234- to the brake fluid reservoir.
– Provide a suitable catch pan for used brake fluid.
– Remove the dust caps of the bleeder valves at the brake calipers.
– Switch on the brake filling and bleeding device and activate the system with a brake fluid pressure of approx. 0.2 MPa.



– Fit the hose of the bleeding bottle -1- onto the corresponding bleeder valve.
– Loosen bleeder valve.
– Extract as much brake fluid as possible until even the smallest air bubbles have escaped.
– Close vent valve.
– Repeat this procedure for all brake calipers in the prescribed sequence until the brake system is fully bled.



Bleeding sequence

1. Front left brake caliper
2. Front right brake caliper
3. Rear left brake caliper
4. Rear right brake caliper

– Inspect pedal position and idle travel at brake pedal. Idle travel: max. 1/3 of pedal travel.
– Repeat the whole procedure if necessary (several times), until perfect bleeding is achieved.
– After bleeding close the relevant vent valve and fit dust cap.
– If necessary, correct the brake fluid level in the brake fluid reservoir.
– Disconnect the brake filling and bleeding device .
– Disconnect the brake filling and bleeding device from the brake fluid reservoir.
– Perform a test drive. While doing so, at least one ABS adjustment must be carried out on vehicles with ABS!

6.4 Subsequent bleeding of hydraulic system

Special tools and workshop equipment required

- Bleeder bottle
- Brake fluid

Subsequent bleeding must be performed if the brake pedal travels too far or if the »brake pedal "feels" soft«.

Note

A second mechanic is needed for this task.

– Firmly push the brake pedal to the floor and keep it held down.
– Connect the bleeder bottle.
– Open the bleeder screw on the brake caliper.
– Fully depress brake pedal.
– Close bleeder valve with pedal held down.
– Release brake pedal slowly.
– Repeat this operation on all calipers in the prescribed sequence at least 5 times.

Bleeding sequence

1. Front left brake caliper
2. Front right brake caliper
3. Rear left brake caliper
4. Rear right brake caliper

– Perform a test drive. While doing so, at least one ABS adjustment must be carried out on vehicles with ABS!

6.5 Testing leak-tightness

Special tools and workshop equipment required

♦ Brake system tester e. g. -V.A.G 1310 A-
♦ Adapter M 10 e.g. -V.A.G 1310/6-

Test requirements:

• Function and tightness of the brake system (brake lines, brake hoses, brake calipers, hydraulic unit) O.K.

– Unscrew and remove the bleeder screw on one of the front brake calipers.
– Connect the brake system tester e.g. - V.A.G 1310 A- to the brake caliper and bleed.
– Push down brake pedal until the pressure gauge indicates 5 MPa (50 bar). Throughout the test which lasts 45 s the pressure loss must not exceed 0.4 MPa (4 bar). If the loss of pressure is higher, replace the master brake cylinder.
– Separate brake system tester e.g. - V.A.G 1310 A- .
– Screw the bleeder screw into the caliper and bleed the brake caliper.