



## Workshop Manual Crafter 2006 ➤

### Brake systems

Edition 09.2015



## List of Workshop Manual Repair Groups

### Repair Group

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

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## 00 – Technical data

### 1 Technical data

(VRL008190; Edition 09.2015)

⇒ [“1.1 Technical data for brakes”, page 1](#)

#### 1.1 Technical data for brakes

##### Brake master cylinder and brake servo

Brake master cylinder	Diameter in mm	25.4
Brake servo	Diameter in inches	10/10

##### Front brakes

Front brake		Floating caliper disc brake
Piston diameter	mm	2 x 48
Internally ventilated brake disc	Diameter, mm	300
Brake disc thickness	mm	28
Brake pad thickness (without backplate)	mm	13.5

##### Rear brakes

Type		Crafter 3.0 t and 3.5 t	Crafter 5.0 t
Rear brake		Floating caliper disc brake	
Piston diameter	mm	51	47
Brake disc	Diameter, mm	298	303
Ventilated brake disc thickness	mm	16 No	28 Yes
Brake pad thickness (without backplate)	mm	13	15
Handbrake		Duo-Servo	Duo-Servo
Brake lining width	mm	25	42



## 2 Brake test

⇒ [“2.1 General information”, page 2](#)

⇒ [“2.2 Checking vehicles with rear-wheel drive”, page 2](#)

⇒ [“2.3 General notes on brakes for Crafter 4MOTION with Achleitner four-wheel drive”, page 2](#)

### 2.1 General information

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



#### Note

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

### 2.2 Checking vehicles with rear-wheel drive

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

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

The test rigs authorised by Volkswagen fulfil these requirements.

### 2.3 General notes on brakes for Crafter 4MOTION with Achleitner four-wheel drive



#### Note

*If the vehicle is tested on a single-axle roller dynamometer or power-absorption roller, a two-axle roller dynamometer needs to be used due to permanent four-wheel drive operation.*



#### Note

*Please always apply handbrake when parking. Make sure that the transfer box is not in neutral position. This is important to prevent the vehicle from rolling when parked on inclines/declines.*



#### WARNING

*Activating differential lock restricts ABS functionality.*



## 45 – Anti-lock brake system

### 1 General information

⇒ [“1.1 General notes on ABS”, page 3](#)

⇒ [“1.2 Repair instructions for repair work on ABS”, page 3](#)

⇒ [“1.3 Fault display via warning lamps”, page 5](#)

#### 1.1 General notes on ABS

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

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



#### Note

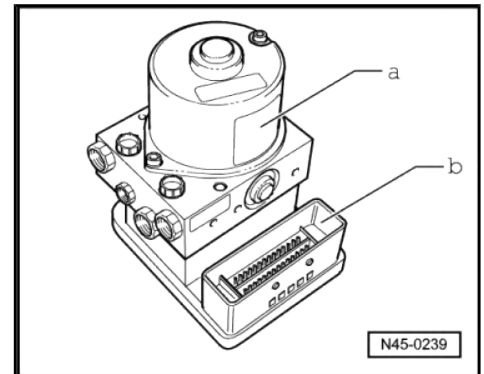
*Faults in the ABS do not influence the brake system and servo assistance. The conventional brake system remains functional even without ABS. A change in braking behaviour is to be reckoned with. After the ABS warning lamp comes on, the rear wheels may lock prematurely during braking.*

The hydraulic unit -a- and control unit -b- form one component. They can be separated only when removed.



#### Note

*If the ABS hydraulic unit - N55- with the ABS control unit - J104- is renewed, it must be recoded ⇒ Vehicle diagnostic tester.*



#### 1.2 Repair instructions for repair work on ABS

- ◆ Before carrying out repair work on the anti-lock braking system, determine the cause of the fault using ⇒ Vehicle diagnostic tester.



#### Note

*If the ABS hydraulic unit - N55- with the ABS control unit - J104- is renewed, it must be recoded ⇒ Vehicle diagnostic tester.*

- ◆ Disconnect battery earth strap with ignition switched off.
- ◆ Before carrying out welding work with an electric welding unit ⇒ Special information; Body No. 19; Notes on safety .
- ◆ When working with brake fluid, observe the relevant safety precautions and notes ⇒ [page 88](#) .
- ◆ After work for which the brake system had to be opened, bleed the brake system with brake filling and bleeding equipment - VAS 5234- ⇒ [page 88](#) .



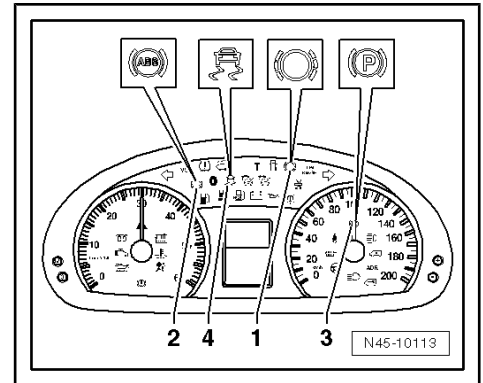
- ◆ During the final road test, ensure that a controlled brake test is performed at least once (pulsations must be felt at the brake pedal).
- ◆ Absolute cleanliness is required when working on the anti-lock brake system. Auxiliary items containing mineral oil, e.g. oils, greases, etc. must never be used.
- ◆ Thoroughly clean all unions and the adjacent areas before loosening. Do not use aggressive cleaning agents such as brake cleanser, petrol, thinners or similar.
- ◆ Place removed parts on a clean surface and cover.
- ◆ After separating the control unit/hydraulic unit, use the transport protection for the contact pins.
- ◆ If repairs cannot be carried out immediately, carefully cover or seal open components. (Use sealing plugs from repair kit 1H0 698 311 A).
- ◆ Only use lint-free cloths.
- ◆ Only unpack replacement parts immediately prior to fitting.
- ◆ Only use genuine packed parts.
- ◆ When the system is open, do not work with compressed air and do not move the vehicle.
- ◆ During painting operations, the electronic control unit can be exposed to a maximum temperature of 95°C for only a short period, and to a maximum of 85°C for longer periods (approx. 2 hours). Ensure that no brake fluid enters connectors.



## 1.3 Fault display via warning lamps

### Warning lamps

Item	Description
1	Brake pad warning lamp - K32-
2	ABS warning lamp - K47-
3	Brake system warning lamp - K118-
4	Traction control system warning lamp - K86- ESP and TCS warning lamp - K155-



#### Brake pad warning lamp - K32-

- ◆ If brake pad warning lamp - K32- -1- does not go out after ignition is switched on and after completion of test run, or if it comes on during vehicle operation, the faults may be caused by the following:

- a - The brake pads/linings are worn.
  - Check brake pads/linings on front and rear axles.
- b - There is a fault in the activation of the brake pad warning lamp - K32- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

#### ABS warning lamp - K47-

- ◆ If the ABS warning lamp - K47- -2- does not go out after the ignition has been switched on and test sequence has been completed, then the fault may be:

- a - The voltage supply is below 10 volts.
- b - There is a fault in the ABS.

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

- c - Since the last time the vehicle was started there was a temporary speed sensor fault.

In the event of a speed sensor fault, the ABS warning lamp - K47- will extinguish after the engine is restarted and attains a speed above 2.75 km/h.

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

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

- ◆ If ABS warning lamp - K47- -2- goes out but brake system warning lamp - K118- -3- remains on, the causes of the fault may be:

- a - The handbrake is applied.
- b - The brake fluid level is too low.
- c - There is a fault in the activation of the brake pad warning lamp - K118- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- ◆ If the ABS warning lamp - K47- -2- and the brake system warning lamp - K118- -3- light up, the anti-lock brake system and the EBD (electronic brake pressure distribution) system have failed.



**WARNING**

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

**Traction control system warning lamp - K86-**

Only on vehicles equipped with traction control system.

◆ If the traction control system warning lamp - K86- -4- does not go out after the ignition is switched on and completion of the test sequence, the fault causes may be:

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

b - Fault in activation of traction control system warning lamp - K86- → Current flow diagrams, Electrical fault finding and Fitting locations

- Traction control system has been switched off by ESP and TCS button - E256-

There is a fault which affects only the TCS safety system. ABS and EBD safety systems of vehicle remain fully functional.



**Note**

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

**ESP and TCS warning lamp - K155-**

Only in vehicles with ESP.

◆ If the ESP and TCS warning lamp - K155- -4- does not go out after ignition is switched on and the test sequence has been completed, then the fault may be:

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

b - Fault in activation of stabilisation program warning lamp - K155- → Current flow diagrams, Electrical fault finding and Fitting locations

c - TCS and ESP system has been switched off by TCS and ESP button - E256- .

There is a fault affecting only the TCS/ESP. ABS and EBD safety systems of vehicle remain fully functional → Read event memory.



**Note**

*If ESP and TCS warning lamp - K155- flashes during travel, traction control system (TCS) or ESP system is in operation.*



## 2 Overview of fitting locations

⇒ [“2.1 Overview of fitting locations - ABS/ESP”, page 7](#)

### 2.1 Overview of fitting locations - ABS/ESP

⇒ [“2.1.1 Components and fitting locations, ABS/TCS/ESP Bosch 8.1, Crafter 3.0 t and 3.5 t”, page 7](#)

⇒ [“2.1.2 Components and fitting locations, ABS/TCS/ESP Bosch 8.1, Crafter 5.0 t”, page 9](#)

⇒ [“2.1.3 Components and fitting locations, ABS/TCS/ESP Bosch 9i, Crafter 3.0 t and 3.5 t, 2012 >”, page 10](#)

⇒ [“2.1.4 Components and fitting locations, ABS/TCS/ESP Bosch 9i, Crafter 5.0 t, 2012 >”, page 12](#)

#### 2.1.1 Components and fitting locations, ABS/TCS/ESP Bosch 8.1, Crafter 3.0 t and 3.5 t

##### 1 - ABS hydraulic unit - N55-

- ❑ Removing and installing up to week 27/2012  
⇒ [page 33](#)
- ❑ Removing and installing from week 27/2012  
⇒ [page 20](#)
- ❑ If the hydraulic control unit is defective, it can be replaced only as a complete unit.

##### 2 - ABS control unit - J104-

- ❑ If the hydraulic control unit is defective, it can be replaced only as a complete unit.
- ❑ Removing and installing up to week 27/2012  
⇒ [page 33](#)
- ❑ Removing and installing from week 27/2012  
⇒ [page 20](#)

##### 3 - ABS warning lamp - K47-

- ❑ Fault display ⇒ [page 5](#)

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

- ❑ Fault display ⇒ [page 5](#)

##### 5 - Brake pad warning lamp - K32-

- ❑ Fault display ⇒ [page 5](#)

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

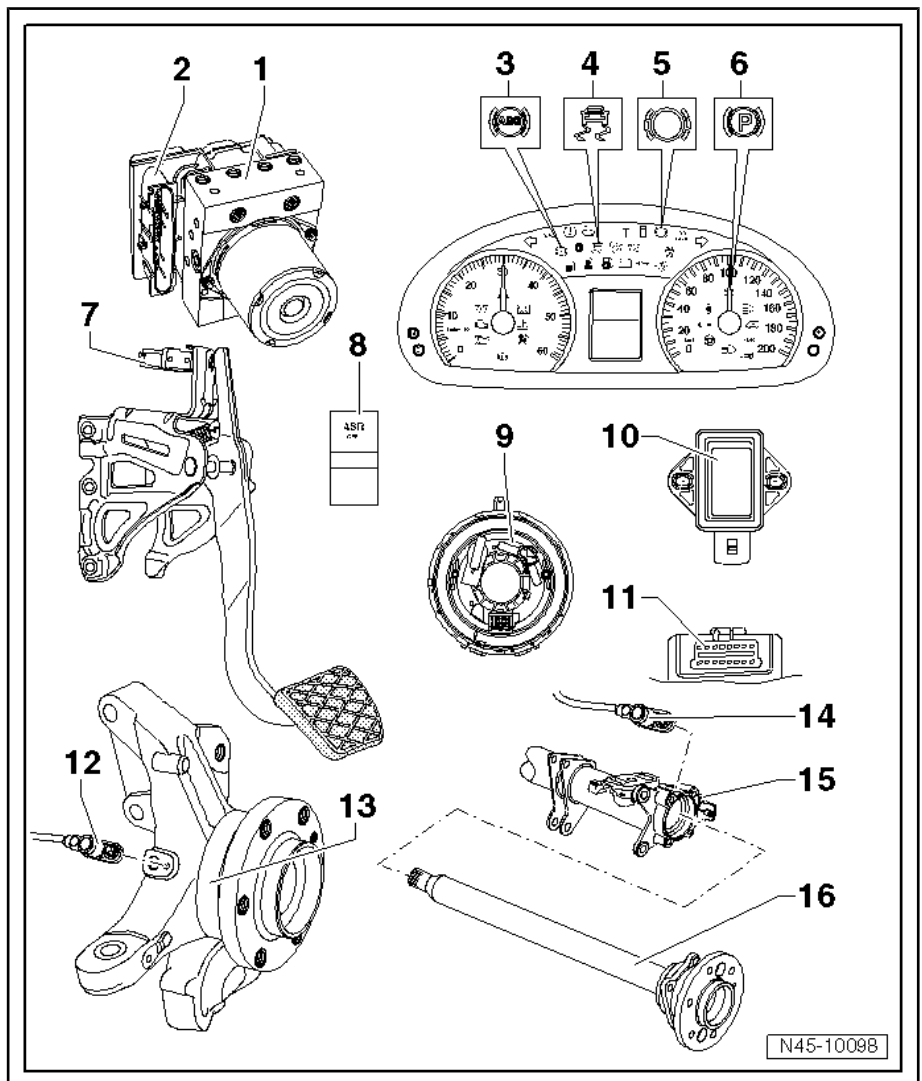
- ❑ Fault display ⇒ [page 5](#)

##### 7 - Brake light switch - F-

- ❑ Removing and installing ⇒ [page 76](#)

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

- ❑ Location: in centre of dash panel.





**9 - Steering angle sender - G85-**

- Only on vehicles having ESP
- Location: on steering column between steering wheel and steering column switch

**10 - Lateral acceleration sender - G200- , longitudinal acceleration sender - G251- and yaw rate sender - G202-**

- Only on vehicles having ESP
- Combined in one housing.
- Location: Under driver's seat.
- Removing and installing ⇒ [page 33](#)

**11 - Diagnostic connection**

- Fitting location: driver footwell

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

- Removing and installing ⇒ [page 25](#)

**13 - Wheel bearing housing with wheel bearing/wheel bearing unit**

- ABS sensor ring is installed in wheel bearing.

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

- Removing and installing ⇒ [page 30](#)

**15 - Axle beam**

**16 - Rear axle shaft with wheel bearing/wheel bearing unit**

- ABS sensor ring is installed in wheel bearing.

Fitting location: the diagnostic connection is located on the left A-pillar in the footwell.



## 2.1.2 Components and fitting locations, ABS/TCS/ESP Bosch 8.1, Crafter 5.0 t

### 1 - ABS hydraulic unit - N55-

- Removing and installing up to week 27/2012  
⇒ [page 33](#)
- Removing and installing from week 27/2012  
⇒ [page 20](#)
- If the hydraulic control unit is defective, it can be replaced only as a complete unit.

### 2 - ABS control unit - J104-

- If the hydraulic control unit is defective, it can be replaced only as a complete unit.
- Removing and installing up to week 27/2012  
⇒ [page 33](#)
- Removing and installing from week 27/2012  
⇒ [page 20](#)

### 3 - ABS warning lamp - K47-

- Fault display ⇒ [page 5](#)

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

- Fault display ⇒ [page 5](#)

### 5 - Brake pad warning lamp - K32-

- Fault display ⇒ [page 5](#)

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

- Fault display ⇒ [page 5](#)

### 7 - Brake light switch - F-

- Removing and installing ⇒ [page 76](#)

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

- Location: in centre of dash panel.

### 9 - Steering angle sender - G85-

- Only on vehicles having ESP
- Location: on steering column between steering wheel and steering column switch

### 10 - Lateral acceleration sender - G200- , longitudinal acceleration sender - G251- and yaw rate sender - G202-

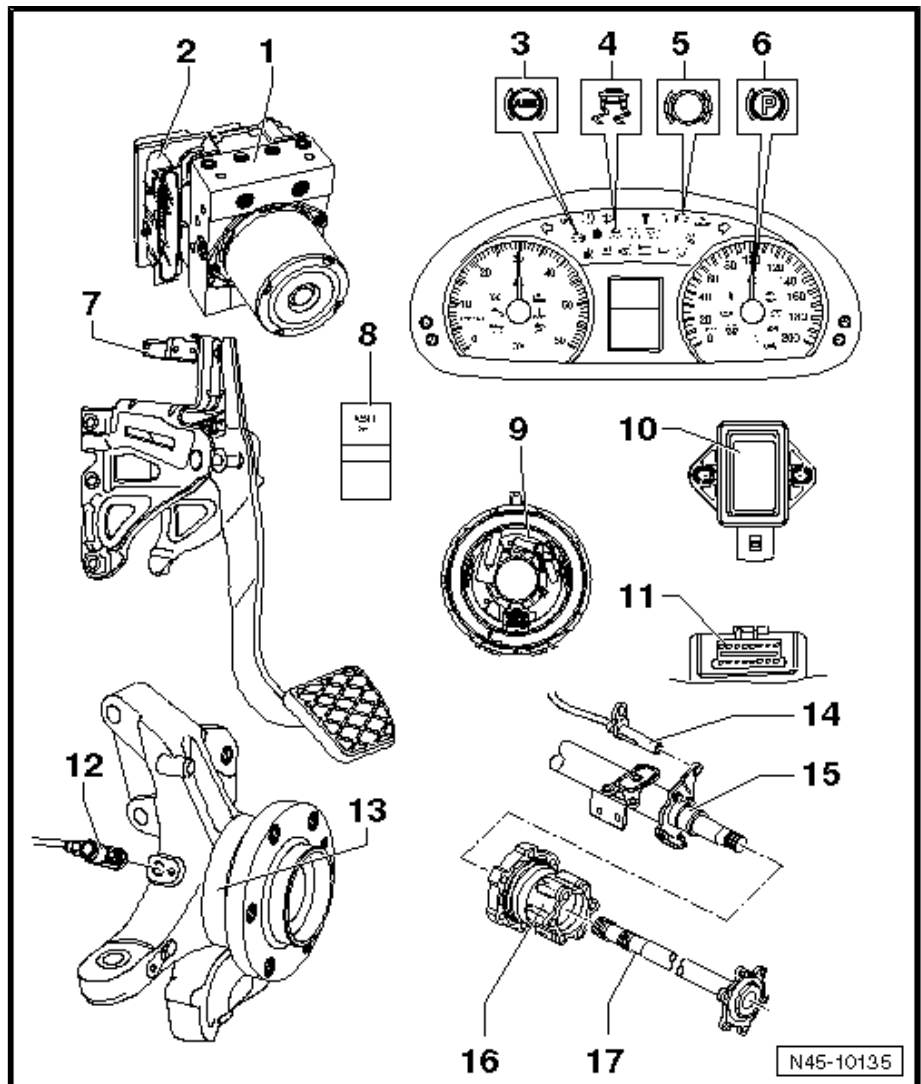
- Only on vehicles having ESP
- Combined in one housing.
- Location: Under driver's seat.
- Removing and installing ⇒ [page 33](#)

### 11 - Diagnostic connection

- Fitting location: driver footwell

### 12 - Front right speed sensor - G45- / front left speed sensor - G47-

- Removing and installing ⇒ [page 25](#)





### 13 - Wheel bearing housing with wheel bearing/wheel bearing unit

- ❑ ABS sensor ring is installed in wheel bearing.

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

- ❑ Removing and installing  
⇒ ["4.2.2 Assembly overview - speed sensor on rear axle, Crafter 5.0 t", page 28](#)

### 15 - Axle beam

### 16 - Rear axle hub with wheel bearing/wheel bearing unit

- ❑ ABS sensor ring is installed in rear axle hub.

### 17 - Rear axle shaft

Fitting location: the diagnostic connection is located on the left A-pillar in the footwell.

## 2.1.3 Components and fitting locations, ABS/TCS/ESP Bosch 9i, Crafter 3.0 t and 3.5 t, 2012 >

### 1 - ABS hydraulic unit - N55-

- ❑ Removing and installing up to week 27/2012  
⇒ [page 33](#)
- ❑ Removing and installing from week 27/2012  
⇒ [page 20](#)
- ❑ If the hydraulic control unit is defective, it can be replaced only as a complete unit.

### 2 - ABS control unit - J104-

- ❑ With lateral acceleration sender - G200-, longitudinal acceleration sender - G251- and yaw rate sender - G202- (only on vehicles having ESP)
- ❑ If the hydraulic control unit is defective, it can be replaced only as a complete unit.
- ❑ Removing and installing up to week 27/2012  
⇒ [page 33](#)
- ❑ Removing and installing from week 27/2012  
⇒ [page 20](#)

### 3 - ABS warning lamp - K47-

- ❑ Fault display ⇒ [page 5](#)

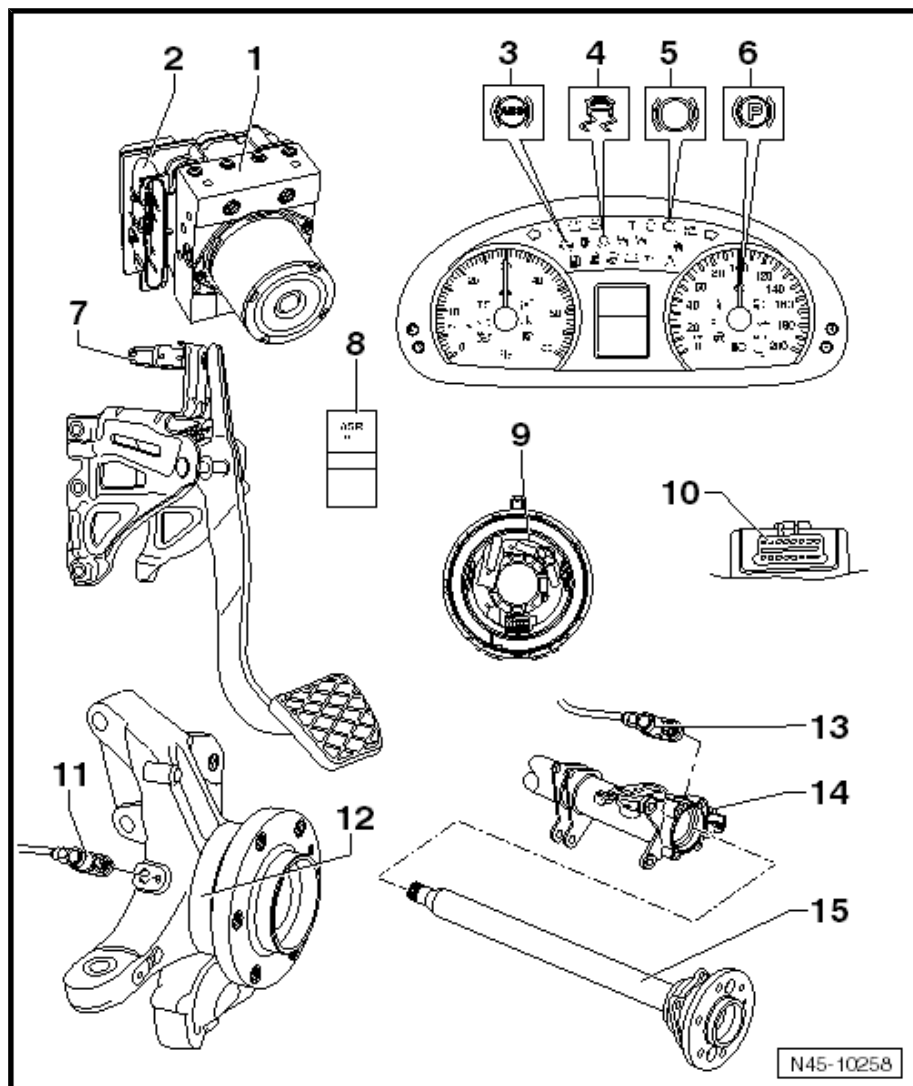
### 4 - ESP and TCS warning lamp - K155-

- ❑ Fault display ⇒ [page 5](#)



#### Note

*TCS only on Crafter 4MOTION with Achleitner four-wheel drive.*



N45-10258



#### 5 - Brake pad warning lamp - K32-

- Fault display ⇒ [page 5](#)

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

- Fault display ⇒ [page 5](#)

#### 7 - Brake light switch - F-

- Removing and installing ⇒ [page 76](#)

#### 8 - ESP button - E256-

- Location: in centre of dash panel.
- Only on vehicles having ESP



#### Note

*Not on Crafter 4MOTION with Achleitner four-wheel drive.*

#### 9 - Steering angle sender - G85-

- Only on vehicles having ESP
- Location: on steering column between steering wheel and steering column switch

#### 10 - Diagnostic connection

- Fitting location: driver footwell

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

- Make sure it is installed in correct position:
- Removing and installing ⇒ [page 25](#) .
- Allocation ⇒ Electronic Parts Catalogue "ETKA"

#### 12 - Wheel bearing housing with wheel bearing/wheel bearing unit



#### Note

- ◆ *Allocation ⇒ Electronic Parts Catalogue "ETKA"*
- ◆ *Modified wheel bearing housing on Crafter 4MOTION with Achleitner four-wheel drive.*
- ◆ *Ensure correct installation position of front speed sensors, because malfunction may otherwise occur ⇒ [page 25](#) .*

- ABS sensor ring is installed in wheel bearing.
- ⇒ Running gear, axles, steering; Rep. gr. 40
- The ABS sensor ring on Crafter 4MOTION with Achleitner four-wheel drive is located on the outer constant velocity joint.
- ⇒ Running gear, axles, steering; Rep. gr. 40

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

- Removing and installing ⇒ [page 30](#)
- Allocation ⇒ Electronic Parts Catalogue "ETKA"

#### 14 - Axle beam

#### 15 - Rear axle shaft with wheel bearing/wheel bearing unit

- ABS sensor ring is installed in wheel bearing.



## 2.1.4 Components and fitting locations, ABS/TCS/ESP Bosch 9i, Crafter 5.0 t, 2012 >

### 1 - ABS hydraulic unit - N55-

- Removing and installing up to week 27/2012  
⇒ [page 33](#)
- Removing and installing from week 27/2012  
⇒ [page 20](#)
- If the hydraulic control unit is defective, it can be replaced only as a complete unit.

### 2 - ABS control unit - J104-

- With lateral acceleration sender - G200- , longitudinal acceleration sender - G251- and yaw rate sender - G202- (only on vehicles having ESP)
- If the hydraulic control unit is defective, it can be replaced only as a complete unit.
- Removing and installing up to week 27/2012  
⇒ [page 33](#)
- Removing and installing from week 27/2012  
⇒ [page 20](#)

### 3 - ABS warning lamp - K47-

- Fault display ⇒ [page 5](#)

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

- Fault display ⇒ [page 5](#)



#### Note

*TCS only on Crafter 4MOTION with Achleitner four-wheel drive.*

### 5 - Brake pad warning lamp - K32-

- Fault display ⇒ [page 5](#)

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

- Fault display ⇒ [page 5](#)

### 7 - Brake light switch - F-

- Removing and installing ⇒ [page 76](#)

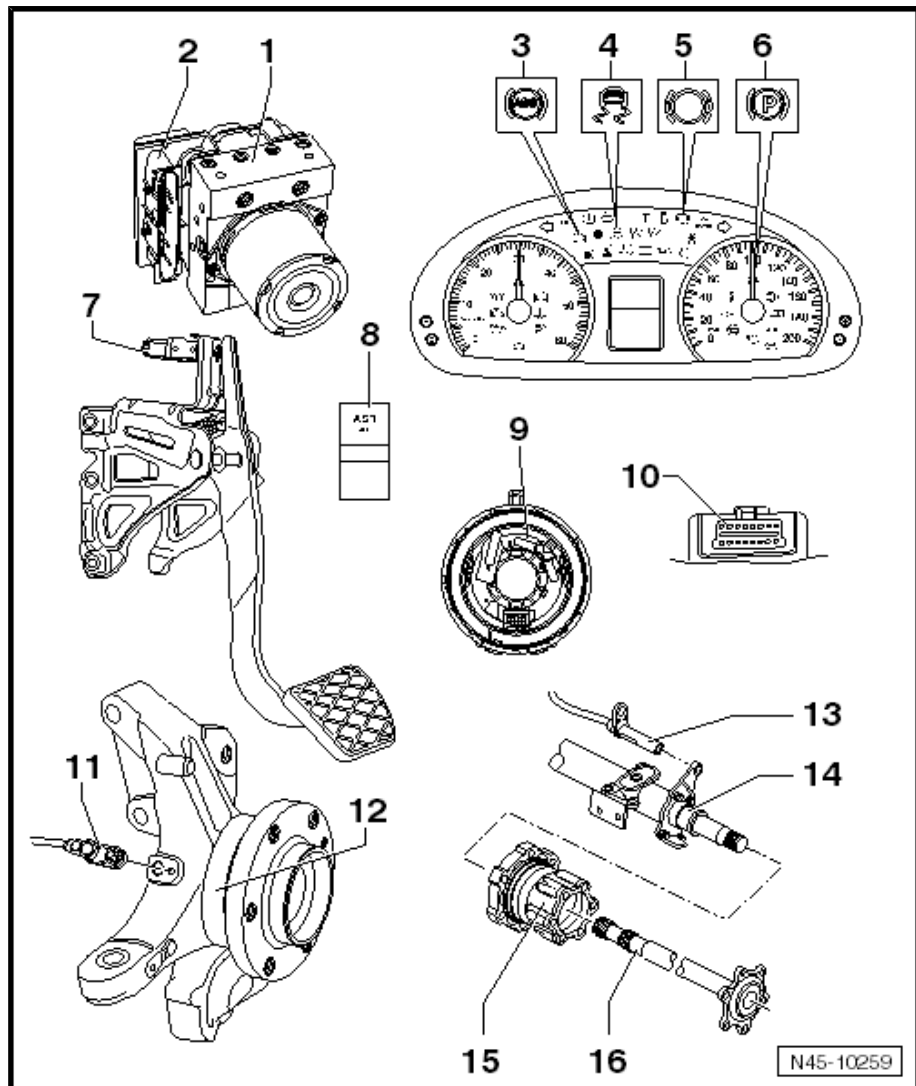
### 8 - ESP button - E256-

- Location: in centre of dash panel.
- Only on vehicles having ESP



#### Note

*Not on Crafter 4MOTION with Achleitner four-wheel drive.*





### 9 - Steering angle sender - G85-

- Only on vehicles having ESP
- Location: on steering column between steering wheel and steering column switch

### 10 - Diagnostic connection

- Fitting location: driver footwell

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

- Make sure it is installed in correct position:
- Removing and installing ⇒ [page 28](#) .
- Allocation ⇒ Electronic Parts Catalogue “ETKA”

### 12 - Wheel bearing housing with wheel bearing/wheel bearing unit



#### Note

- ◆ *Allocation ⇒ Electronic Parts Catalogue “ETKA”*
- ◆ *Modified wheel bearing housing on Crafter 4MOTION with Achleitner four-wheel drive.*
- ◆ *Ensure correct installation position of front speed sensors, because malfunction may otherwise occur ⇒ [page 25](#) .*

- ABS sensor ring is installed in wheel bearing.
- ⇒ Running gear, axles, steering; Rep. gr. 40
- The ABS sensor ring on Crafter 4MOTION with Achleitner four-wheel drive is located on the outer constant velocity joint.
- ⇒ Running gear, axles, steering; Rep. gr. 40

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

- Removing and installing  
⇒ [“4.2.2 Assembly overview - speed sensor on rear axle, Crafter 5.0 t”, page 28](#)
- Allocation ⇒ Electronic Parts Catalogue “ETKA”

### 14 - Axle beam

### 15 - Rear axle hub with wheel bearing/wheel bearing unit

- ABS sensor ring is installed in rear axle hub.

### 16 - Rear axle shaft



### 3 Control unit and hydraulic unit

⇒ [“3.1 Assembly overview - control unit and hydraulic unit”, page 14](#)

⇒ [“3.2 Removing and installing ABS control unit J104 and ABS hydraulic unit N55”, page 18](#)

⇒ [“3.3 Connecting brake lines to hydraulic unit”, page 24](#)

#### 3.1 Assembly overview - control unit and hydraulic unit

⇒ [“3.1.1 Assembly overview - ABS control unit J104 and ABS hydraulic unit N55 up to week 27/2012”, page 14](#)

⇒ [“3.1.2 Assembly overview - ABS control unit J104 and ABS hydraulic unit N55, as of week 27/2012”, page 16](#)

#### 3.1.1 Assembly overview - ABS control unit - J104- and ABS hydraulic unit - N55- up to week 27/2012

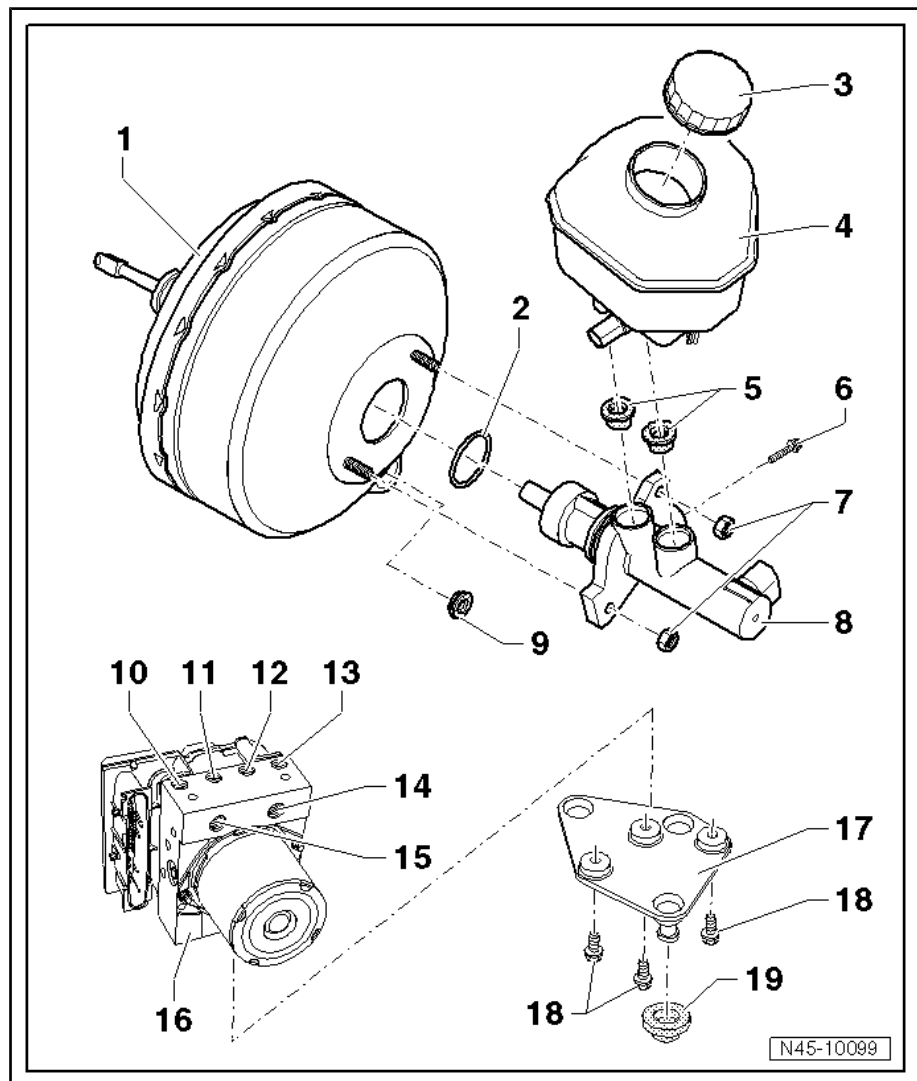
Complete brake master cylinders and brake servos can be renewed independently of each other.

##### 1 - Brake servo

- Diesel engines are fitted with a vacuum pump to generate the necessary vacuum.
- A vacuum reservoir is additionally installed in certain vehicle types.
- Checking function
- With engine switched off, depress brake pedal firmly several times (to deplete vacuum in unit).
- Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.
- If faulty renew complete
- Checking non-return valve (in vacuum hose) ⇒ [page 80](#).
- Separating from brake pedal ⇒ [page 64](#), Removing and installing brake pedal.
- Removing and installing brake servo ⇒ [page 77](#).

##### 2 - Sealing ring

- Renew.





**3 - Cap**

**4 - Brake fluid reservoir**

**5 - Sealing plug**

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

**6 - Bolt**

- To secure brake fluid reservoir to brake master cylinder.

**7 - Nut**

- Self-locking
- 20 Nm

**8 - Brake master cylinder**

- Cannot be repaired, renew complete when faulty.
- Removing and installing ⇒ [page 78](#) .

**9 - Sealing plug**

- Connection for vacuum hose.

**10 - Connection for brake line**

- From hydraulic unit to front right brake caliper.

**11 - Connection for brake line**

- From hydraulic unit to rear left brake caliper.

**12 - Connection for brake line**

- From hydraulic unit to rear right brake caliper.

**13 - Connection for brake line**

- From hydraulic unit to front left brake caliper.

**14 - Connection for brake line**

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

**15 - Connection for brake line**

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

**16 - ABS control unit - J104- and ABS hydraulic unit - N55-**

- If the hydraulic control unit is defective, it can be replaced only as a complete unit.
- Removing and installing ⇒ [page 18](#) .



**Note**

*If the ABS hydraulic unit - N55- with the ABS control unit - J104- is renewed, it must be recoded in guided fault finding ⇒ Vehicle diagnostic tester.*

**17 - Retaining plate**

**18 - Bolt**

- 8 Nm

**19 - Bump stop**



### 3.1.2 Assembly overview - ABS control unit - J104- and ABS hydraulic unit - N55- , as of week 27/2012

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

#### 1 - Brake servo

- Diesel engines are fitted with a vacuum pump to generate the necessary vacuum.
- A vacuum reservoir is additionally installed in certain vehicle types.
- Checking function
- With engine switched off, depress brake pedal firmly several times (to deplete vacuum in unit).
- Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.
- If faulty renew complete
- Checking non-return valve (in vacuum hose) ⇒ [page 80](#) .
- Separating from brake pedal ⇒ [page 64](#) , Removing and installing brake pedal.
- Removing and installing brake servo.

#### 2 - Sealing ring

- Renew.

#### 3 - Cap

#### 4 - Brake fluid reservoir

#### 5 - Sealing plug

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

#### 6 - Bolt

- To secure brake fluid reservoir to brake master cylinder.

#### 7 - Nut

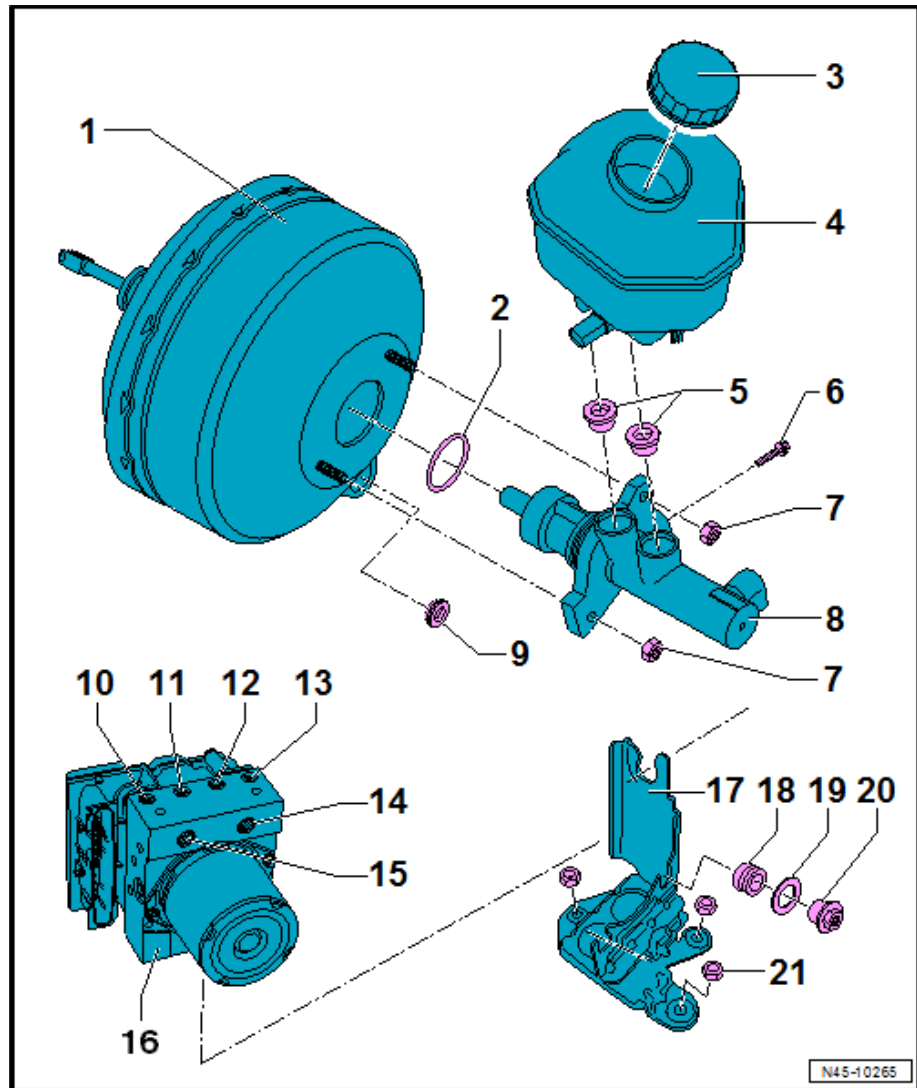
- Self-locking
- 20 Nm

#### 8 - Brake master cylinder

- Cannot be repaired, renew complete when faulty.
- Removing and installing ⇒ [page 78](#) .

#### 9 - Sealing plug

- Connection for vacuum hose.





**10 - Connection for brake line**

- From hydraulic unit to front right brake caliper.
- 14 Nm

**11 - Connection for brake line**

- From hydraulic unit to rear left brake caliper.
- 14 Nm

**12 - Connection for brake line**

- From hydraulic unit to rear right brake caliper.
- 14 Nm

**13 - Connection for brake line**

- From hydraulic unit to front left brake caliper.
- 14 Nm

**14 - Connection for brake line**

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

**15 - Connection for brake line**

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

**16 - ABS control unit - J104- and ABS hydraulic unit - N55-**

- If the hydraulic control unit is defective, it can be replaced only as a complete unit.
- Removing and installing ⇒ [page 20](#)



**Note**

*If the ABS hydraulic unit - N55- with the ABS control unit - J104- is renewed, it must be recoded in guided fault finding⇒ Vehicle diagnostic tester.*

**17 - Bracket**

- Removing ⇒ [page 23](#) .

**18 - Bump stop**

**19 - Washer**

**20 - Nut**

- 8 Nm

**21 - Nut**

- 8 Nm



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

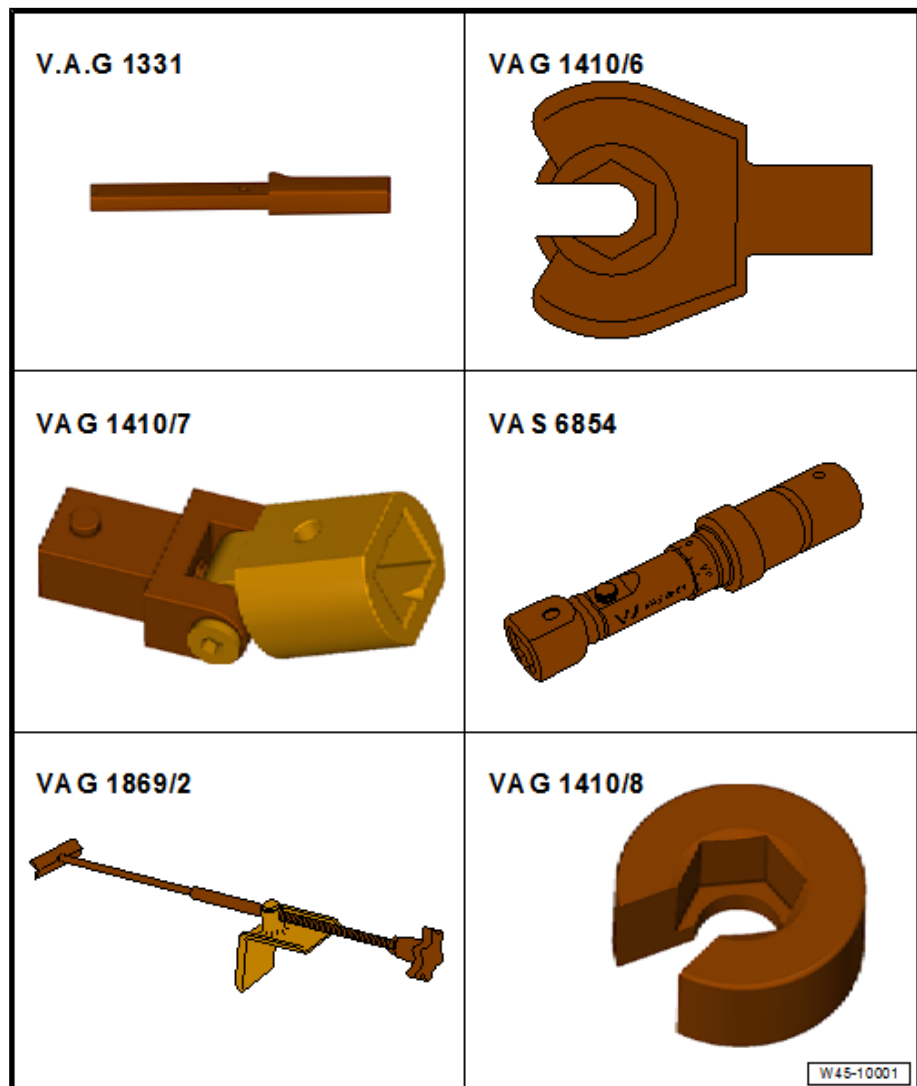
⇒ ["3.2.1 Removing and installing ABS control unit J104 and ABS hydraulic unit N55 , up to week 27/2012", page 18](#)

⇒ ["3.2.2 Removing and installing ABS control unit J104 and ABS hydraulic unit N55 , as of week 27/2012", page 20](#)

#### 3.2.1 Removing and installing ABS control unit - J104- and ABS hydraulic unit - N55- , up to week 27/2012

##### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-
- ◆ Open ring spanner insert, AF 11 mm - V.A.G 1410/6-
- ◆ Universal joint - V.A.G 1410/7-
- ◆ Torque wrench - VAS 6854-
- ◆ Brake pedal depressor - V.A.G 1869/2-
- ◆ Assembly tool - V.A.G 1410/8-





**Sealing plugs from repair kit, part number 1 H0 698 311 A**


- 2 - Sealing plug M10
- 3 - Sealing plug M12

**Removing**

Location:

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

If problems are reported, the hydraulic unit and the control unit must be renewed together.



**WARNING**

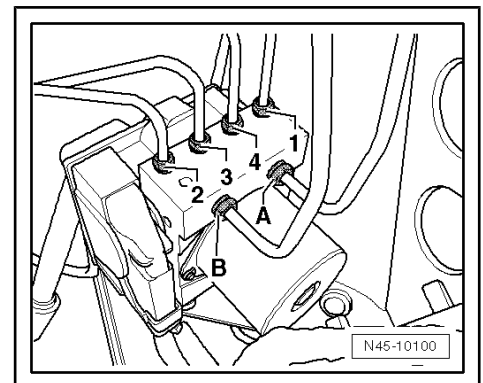
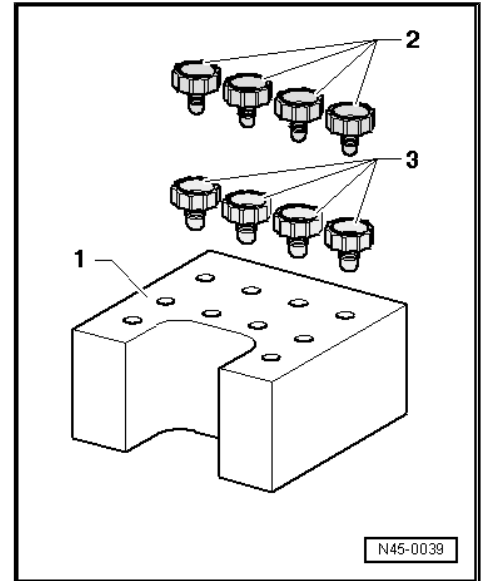
*Do not bend the brake lines in the area of the hydraulic unit!*

- Note or request radio code on vehicles with coded radio if necessary.
- Disconnect battery → Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Connect bleeder bottle hose to front left brake caliper bleed valve and open bleed valve.
- Use brake pedal depressor - V.A.G 1869/2- to depress brake pedal.
- Close front left bleed valve.
- Place sufficient lint-free cloths under the control unit and hydraulic unit.

 **Note**

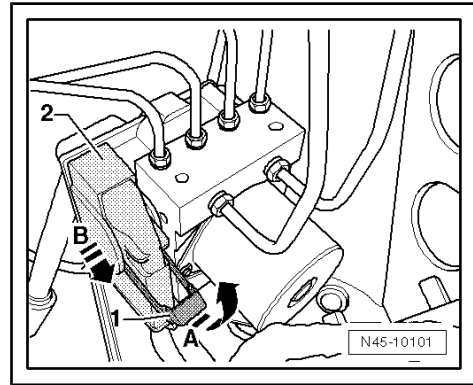
*Ensure no brake fluid gets onto contacts.*

- Unscrew brake lines -1- to -4-, -A- and -B- from ABS hydraulic unit - N55- .
- Seal brake lines and threaded holes using sealing plugs - 1H0 698 311 A- from repair kit.





- Release retainer -1- for connector -2- on control unit in direction of -arrow A- and pull connector from control unit in direction of -arrow B-.



- Remove ABS hydraulic unit - N55- together with ABS control unit - J104- -1-.

To do this, first pull ABS hydraulic unit - N55- with ABS control unit - J104- out of rubber buffers -4- beneath control unit and then beneath hydraulic unit.

- Remove bolt -3- from retaining plate -2-.

### Installing

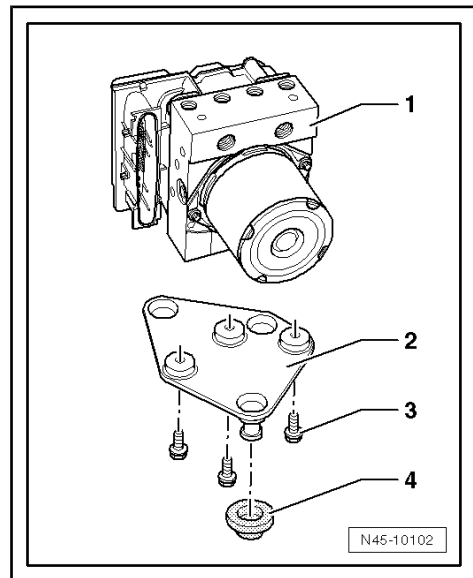


#### Note

If the ABS hydraulic unit - N55- with the ABS control unit - J104- is renewed, it must be recoded in guided fault finding → Vehicle diagnostic tester.

Install in reverse order. Note the following points:

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



#### Caution

**Brake line nuts must be screwed to end of threads into ABS hydraulic unit - N55- by hand.**

**Only then may the nuts be tightened to the specified torque.**

- Bleed brake system ⇒ [page 88](#) .
- Carry out a road test.
- Perform road test at more than 40 km/h for at least 80 seconds.
- Read event memory after road test ⇒ Vehicle diagnostic tester.

### Specified torques

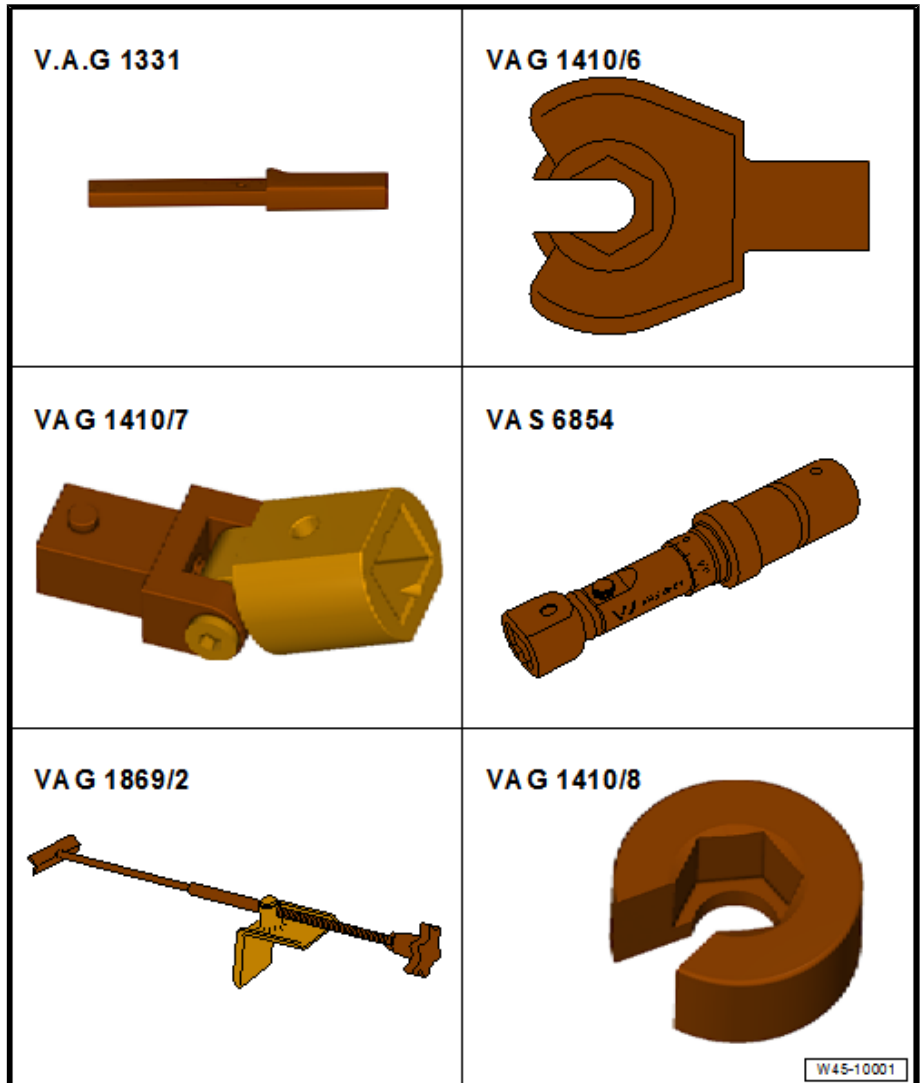
- ◆ ⇒ [“3.1 Assembly overview - control unit and hydraulic unit”, page 14](#)

## 3.2.2 Removing and installing ABS control unit - J104- and ABS hydraulic unit - N55- , as of week 27/2012



**Special tools and workshop equipment required**

- ◆ Torque wrench - V.A.G 1331-
- ◆ Open ring spanner insert, AF 11 mm - V.A.G 1410/6-
- ◆ Universal joint - V.A.G 1410/7-
- ◆ Torque wrench - VAS 6854-
- ◆ Brake pedal depressor - V.A.G 1869/2-
- ◆ Assembly tool - V.A.G 1410/8-





### Sealing plugs from repair kit, part number 1 H0 698 311 A

2 - Sealing plug M10

3 - Sealing plug M12

#### Removing

Location:

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

If problems are reported, the hydraulic unit and the control unit must be renewed together.



#### WARNING

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

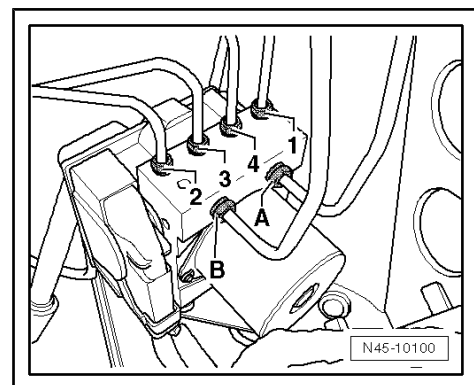
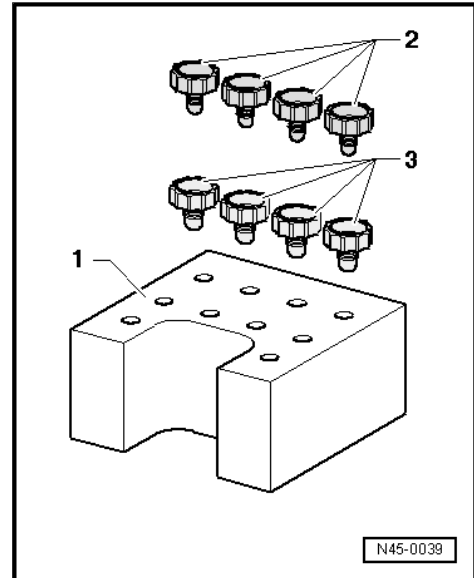
- Note or request radio code on vehicles with coded radio if necessary.
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Connect bleeder bottle hose to front left brake caliper bleed valve and open bleed valve.
- Use brake pedal depressor - V.A.G 1869/2- to depress brake pedal.
- Close front left bleed valve.
- Place sufficient lint-free cloths under the control unit and hydraulic unit.



#### Note

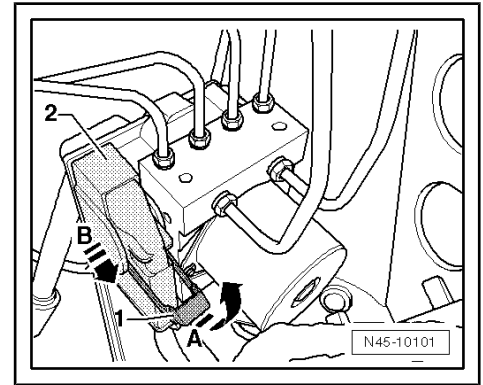
*Ensure no brake fluid gets onto contacts.*

- Unscrew brake lines -1- to -4-, -A- and -B- from ABS hydraulic unit - N55- .
- Seal brake lines and threaded holes using sealing plugs - 1H0 698 311 A- from repair kit.



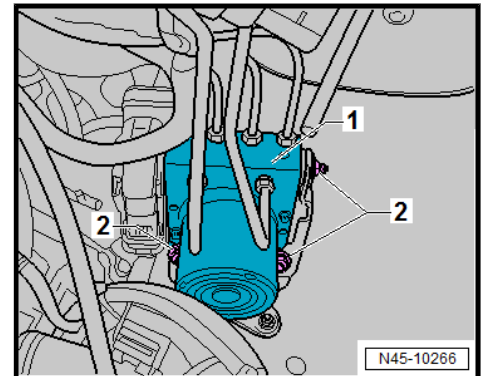


- Release retainer -1- for connector -2- on control unit in direction of -arrow A- and pull connector from control unit in direction of -arrow B-.
- Remove nuts -2- and remove rubber buffer with washer



- Pull ABS hydraulic unit - N55- with ABS control unit - J104- -1- upwards out of bracket.
- Set ABS hydraulic unit - N55- with ABS control unit - J104- on a clean surface.

#### Removing bracket



- Remove nuts -1- and remove bracket -1- for ABS hydraulic unit - N55- with ABS control unit - J104- upwards.

#### Installing

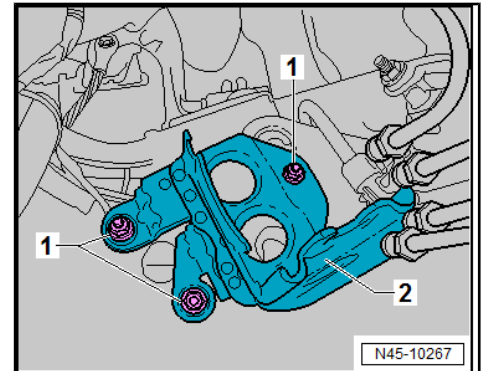


#### Note

*If the ABS hydraulic unit - N55- with the ABS control unit - J104- is renewed, it must be recoded in guided fault finding ⇒ Vehicle diagnostic tester.*

Install in reverse order. Note the following points:

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



#### Caution

***Brake line nuts must be screwed to end of threads into ABS hydraulic unit - N55- by hand.***

***Only then may the nuts be tightened to the specified torque.***

#### Specified torques ⇒ [page 16](#)

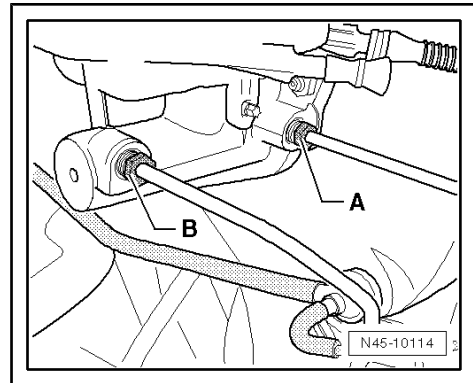
- Bleed brake system ⇒ [page 88](#) .
- Carry out a road test.
- Perform road test at more than 40 km/h for at least 80 seconds.
- Read event memory after road test ⇒ Vehicle diagnostic tester.



### 3.3 Connecting brake lines to hydraulic unit

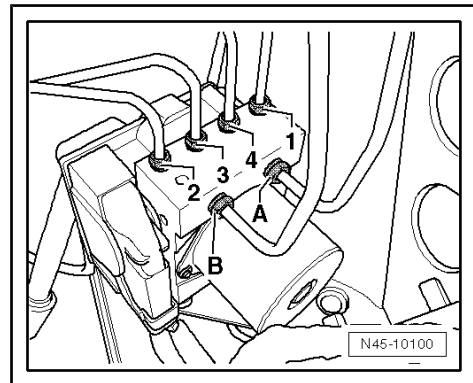
#### On brake master cylinder:

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



#### On hydraulic unit:

- A - From hydraulic unit to primary piston circuit of brake master cylinder.
  - Marked on hydraulic unit with -HZ1-.
- B - From hydraulic unit to secondary piston circuit of brake master cylinder.
  - Marked on hydraulic unit with -HZ2-.
- 1 - From hydraulic unit to front left brake caliper.
  - Marked on hydraulic unit with -VL-.
- 2 - From hydraulic unit to front right brake caliper.
  - Marked on hydraulic unit with -VR-.
- 3 - Hydraulic unit, rear left brake caliper.
  - Marked on hydraulic unit with -HL-.
- 4 - Hydraulic unit, rear right brake caliper.
  - Marked on hydraulic unit with -HR-.





## 4 Sensors

⇒ [“4.1 Assembly overview - speed sensor on front axle”, page 25](#)

⇒ [“4.2 Assembly overview - speed sensor on rear axle”, page 26](#)

⇒ [“4.3 Removing and installing speed sensor wire on front axle”, page 28](#)

⇒ [“4.4 Removing and installing speed sensor wire on rear axle, Crafter 3.0 t and 3.5 t”, page 30](#)

⇒ [“4.5 Removing and installing speed sensor wire on rear axle, Crafter 5.0 t”, page 31](#)

⇒ [“4.6 Removing and installing wire for brake pad wear indicator on front axle”, page 32](#)

⇒ [“4.7 Removing and installing wire for brake pad wear indicator on rear axle”, page 33](#)

⇒ [“4.8 Removing and installing yaw rate sender G202 and lateral acceleration sender G200 ”, page 33](#)

⇒ [“4.9 Removing and installing steering angle sender G85 ”, page 34](#)

### 4.1 Assembly overview - speed sensor on front axle



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

- ❑ Removing and installing ⇒ [page 28](#) .

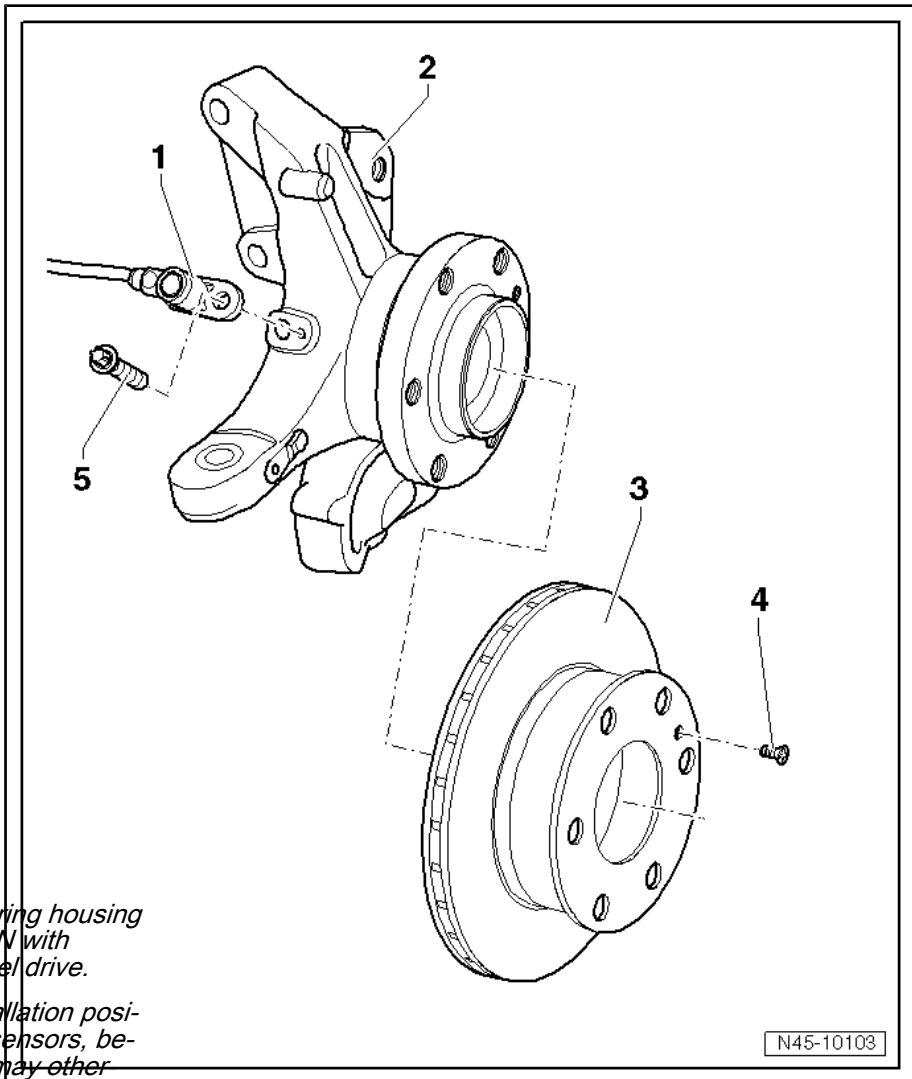
**2 - Wheel bearing housing with wheel bearing/wheel bearing unit**

- ❑ Allocation ⇒ Electronic Parts Catalogue "ETKA"
- ❑ ABS sensor ring is installed in wheel bearing.
- ❑ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Wheel bearing; Assembly overview - wheel bearing
- ❑ The ABS sensor ring on Crafter 4MOTION with Achleitner four-wheel drive is located on the outer constant velocity joint.
- ❑ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .



**Note**

- ◆ *Modified wheel bearing housing on Crafter 4MOTION with Achleitner four-wheel drive.*
- ◆ *Ensure correct installation position of front speed sensors, because malfunction may otherwise occur ⇒ [page 25](#) .*



**3 - Brake disc**

**4 - Bolt**

- ❑ 22 Nm

**5 - Bolt**

- ❑ 8 Nm

## 4.2 Assembly overview - speed sensor on rear axle

⇒ ["4.2.1 Assembly overview - speed sensor on rear axle, Crafter 3.0 t and 3.5 t", page 27](#)

⇒ ["4.2.2 Assembly overview - speed sensor on rear axle, Crafter 5.0 t", page 28](#)



## 4.2.1 Assembly overview - speed sensor on rear axle, Crafter 3.0 t and 3.5 t

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

- Removing and installing  
⇒ [page 30](#) .
- Allocation ⇒ Electronic  
Parts Catalogue "ETKA"

**2 - Bolt, 8 Nm**

**3 - Bolt**

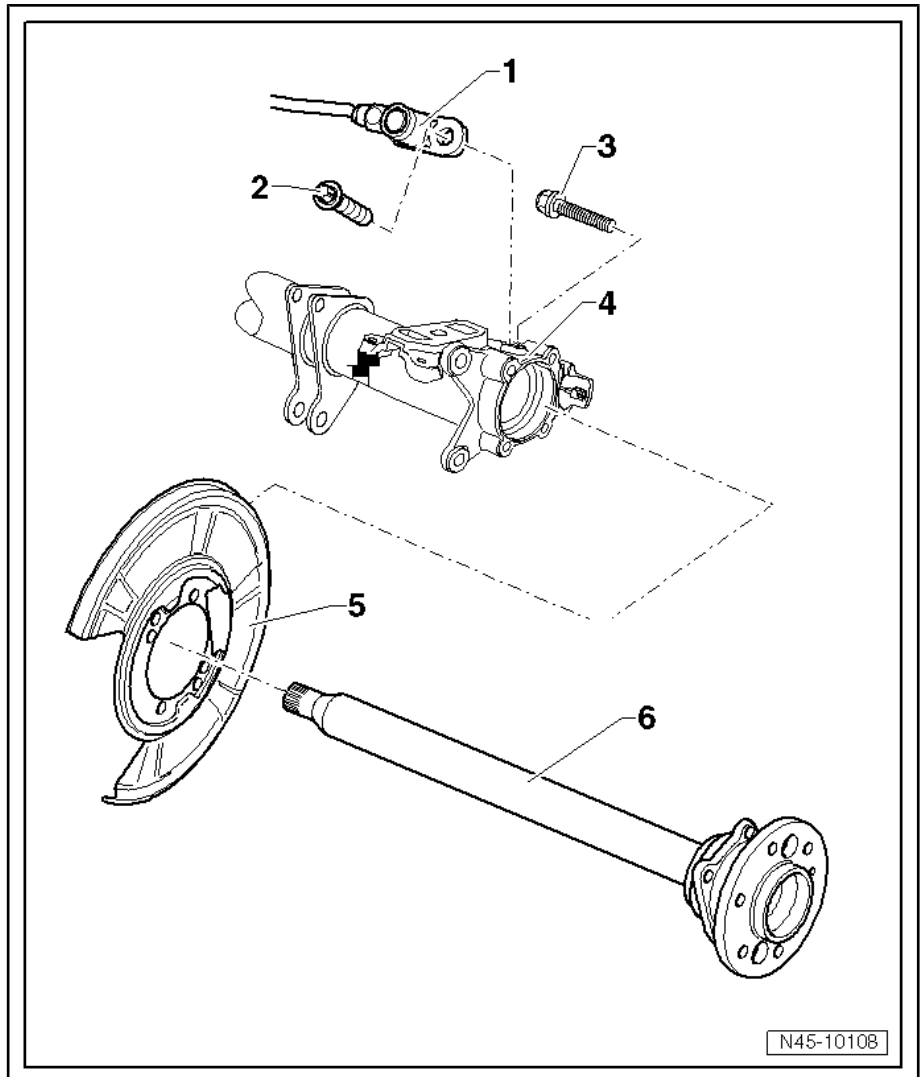
- ⇒ Running gear, axles,  
steering; Rep. gr. 42

**4 - Axle beam**

**5 - Splash plate**

**6 - Rear axle shaft with wheel  
bearing/wheel bearing unit**

- ABS sensor ring is in-  
stalled in wheel bearing.





## 4.2.2 Assembly overview - speed sensor on rear axle, Crafter 5.0 t

1 - Bolt, 8 Nm

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

□ Allocation ⇒ Electronic Parts Catalogue "ETKA"

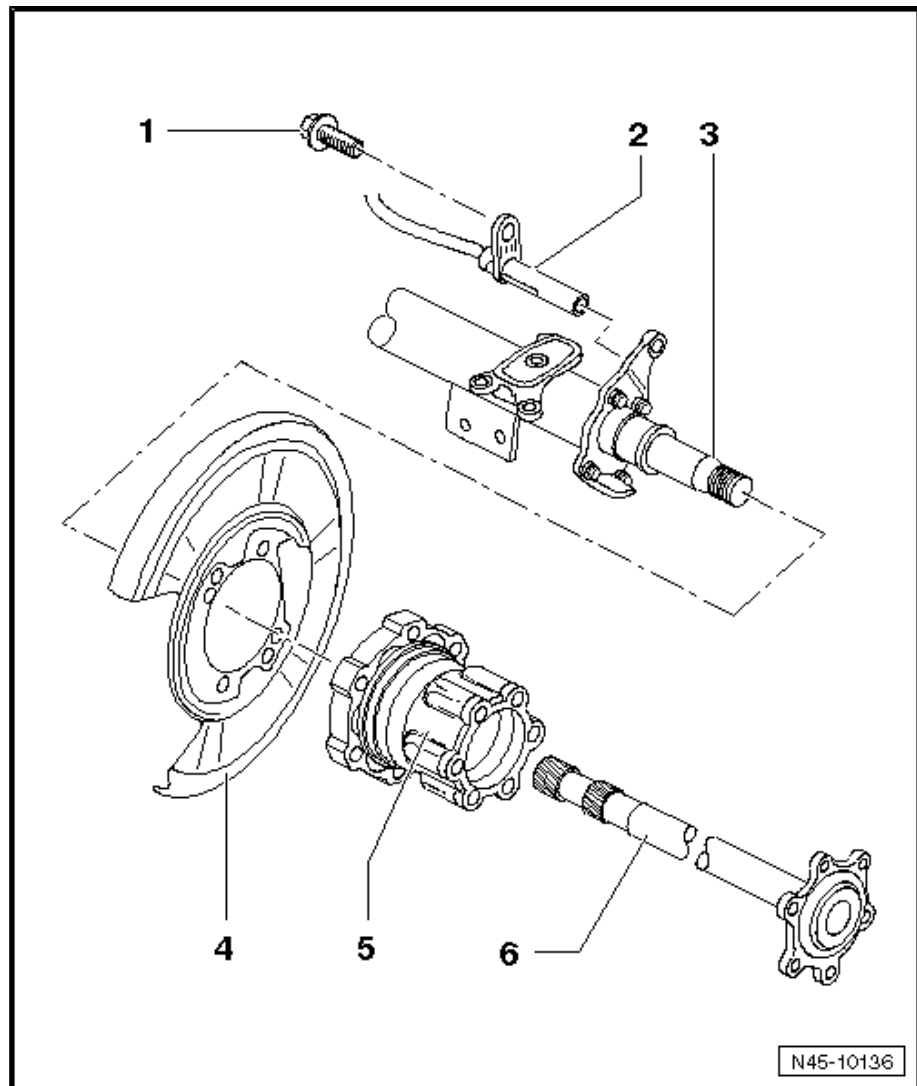
3 - Axle beam

4 - Splash plate

5 - Rear axle hub

□ ABS sensor ring is installed in rear axle hub.

6 - Rear axle shaft



## 4.3 Removing and installing speed sensor wire on front axle

Removing speed sensor wire from control unit to wheel housing  
⇒ [page 28](#)

Installing speed sensor wire from control unit to wheel housing  
⇒ [page 29](#)

Removing speed sensor wire from wheel bearing housing to wheel housing  
⇒ [page 29](#)

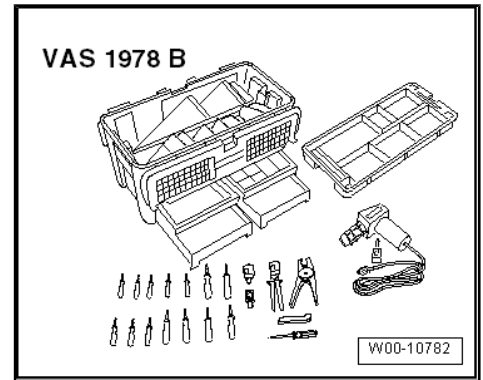
Installing speed sensor wire from wheel bearing housing to wheel housing  
⇒ [page 30](#)

Removing speed sensor wire from control unit to wheel housing

Special tools and workshop equipment required



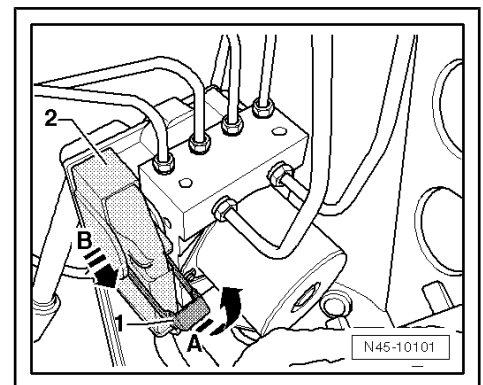
◆ Wiring harness repair set - VAS 1978 B-



- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Release retainer -1- for connector -2- on control unit in direction of -arrow A- and pull connector from control unit in direction of -arrow B-.
- Release cover cap from multi-pin connector using screwdriver, and remove it.

Contact assignment of 38-pin connector - T38- for wiring harness on control unit -J104- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- Use release tool wiring harness repair set - VAS 1978 B- to remove relevant contacts.
- Remove front wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing front wheel housing liner .



- In wheel housing, disconnect connector -1- from speed sensor wire and speed sensor.

- ◆ Connector colour on left side of vehicle: black
- ◆ Connector colour on right side of vehicle: colourless

2 - Connector for brake pad wear indicator (blue)

- Remove defective speed sensor wire.

**Installing speed sensor wire from control unit to wheel housing**

- Install new speed sensor wire.

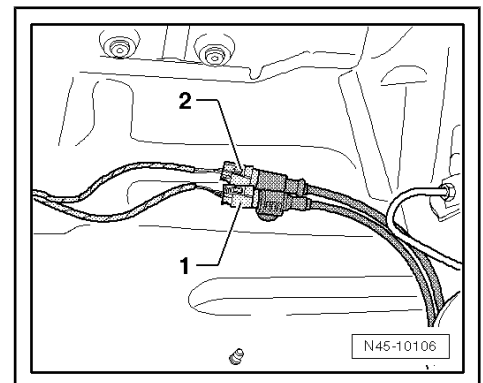
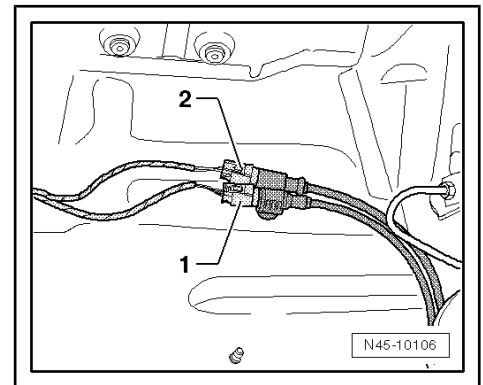
**Removing speed sensor wire from wheel bearing housing to wheel housing**

- Remove front wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing front wheel housing liner .

- In wheel housing, disconnect connector -1- from speed sensor wire and speed sensor.

- ◆ Connector colour on left side of vehicle: black
- ◆ Connector colour on right side of vehicle: colourless

2 - Connector for brake pad wear indicator (blue)





- Unclip speed sensor wire -1- from clips -arrows A- on shock absorber.

#### Crafter 4MOTION with Achleitner four-wheel drive



#### Note

- ◆ *Modified wheel bearing housing on Crafter 4MOTION with Achleitner four-wheel drive.*
- ◆ *Ensure correct installation position of front speed sensors, since otherwise malfunction may occur.*

- Unbolt speed sensor wire from frame.
- Separate cable ties.
- Mark installation position of speed sensor.

#### Continuation for all vehicles

- Unscrew bolt -1- and remove speed sensor -2- from wheel bearing housing.

#### Installing speed sensor wire from wheel bearing housing to wheel housing

Install in reverse order.

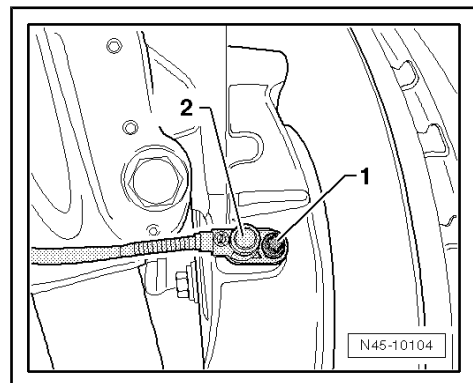
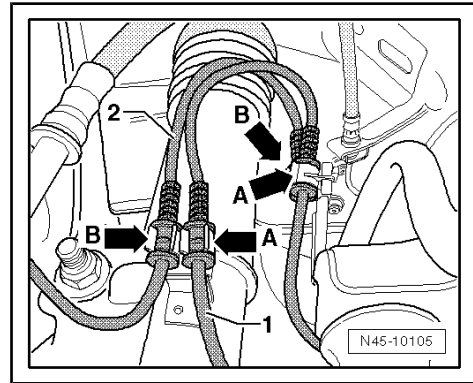
#### Specified torques

- ◆ ⇒ [“4.1 Assembly overview - speed sensor on front axle”, page 25](#)
- ◆ ⇒ [“4.2.1 Assembly overview - speed sensor on rear axle, Crafter 3.0 t and 3.5 t”, page 27](#)
- ◆ ⇒ [“4.2.2 Assembly overview - speed sensor on rear axle, Crafter 5.0 t”, page 28](#)

## 4.4 Removing and installing speed sensor wire on rear axle, Crafter 3.0 t and 3.5 t

#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

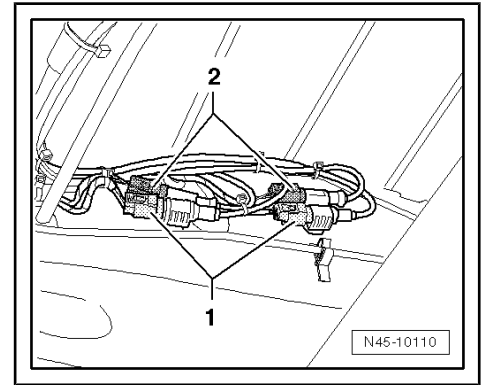


#### Removing speed sensor wire

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .



- On right side of underbody, disconnect connector -1- from speed sensor wire and speed sensor.
- ◆ Connector colour on left side of vehicle: black
- ◆ Connector colour on right side of vehicle: colourless
- 2 - Connector for brake pad wear indicator (blue)
- Separate all speed sensor wire connections to handbrake cable and axle beam.



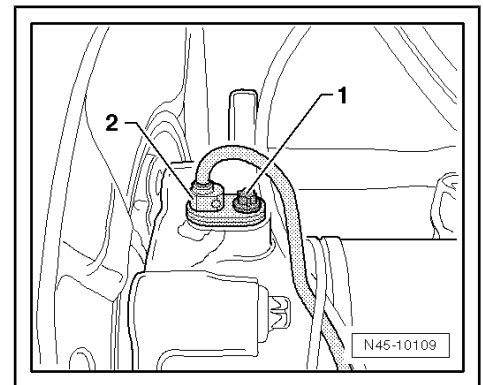
- Unscrew bolt -1- and remove speed sensor -2- from wheel axle beam.

#### Installing speed sensor wire

Install in reverse order.

#### Specified torques

- ◆ ⇒ ["4.2.1 Assembly overview - speed sensor on rear axle, Crafter 3.0 t and 3.5 t", page 27](#)



## 4.5 Removing and installing speed sensor wire on rear axle, Crafter 5.0 t

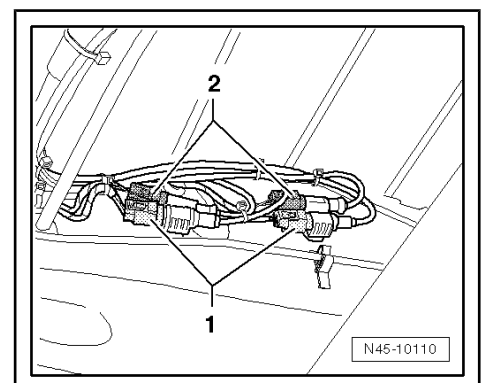
#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



#### Removing speed sensor wire

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- On right side of underbody, disconnect connector -1- from speed sensor wire and speed sensor.
- ◆ Connector colour on left side of vehicle: black
- ◆ Connector colour on right side of vehicle: colourless
- 2 - Connector for brake pad wear indicator (blue)
- Separate all speed sensor wire connections to handbrake cable and axle beam.





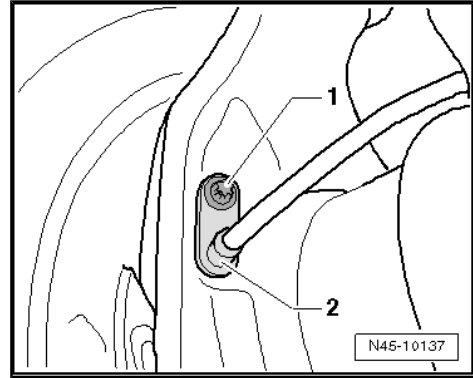
- Unscrew bolt -1- and remove speed sensor -2- from wheel axle beam.

**Installing speed sensor wire**

Install in reverse order.

**Specified torques**

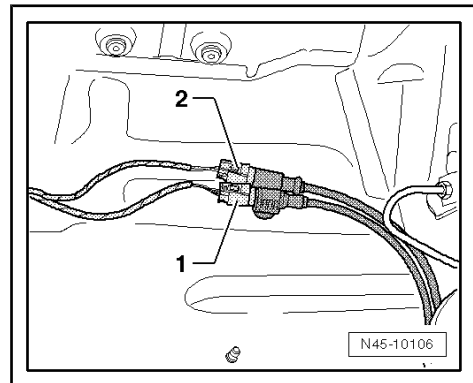
- ◆ => ["4.2.2 Assembly overview - speed sensor on rear axle, Crafter 5.0 t", page 28](#)



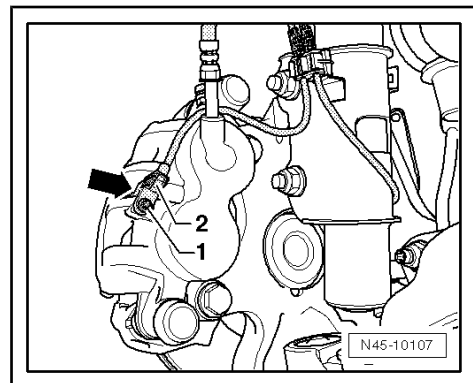
**4.6 Removing and installing wire for brake pad wear indicator on front axle**

**Removing wire for brake pad wear indicator**

- Remove front wheel housing liner => General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing front wheel housing liner .
- In wheel housing, disconnect connector -2-.
- ◆ Connector colour on left and right sides of vehicle: blue



- Unplug connector -arrow-.
- Unscrew bolt -1- and remove connector -2- from brake caliper.



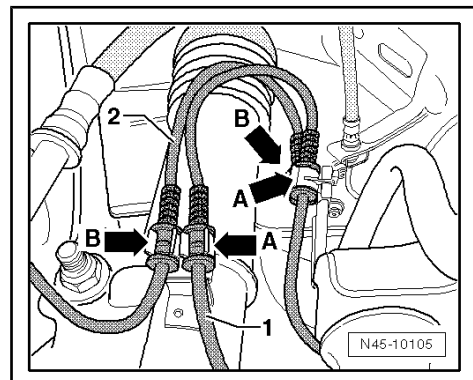
- Unclip wire -2- from clips -arrows B- on shock absorber.

**Installing wire for brake pad wear indicator**

Continue installation in reverse order.

**Specified torques**

Component	Specified torque
Connector to brake caliper	8 Nm





## 4.7 Removing and installing wire for brake pad wear indicator on rear axle

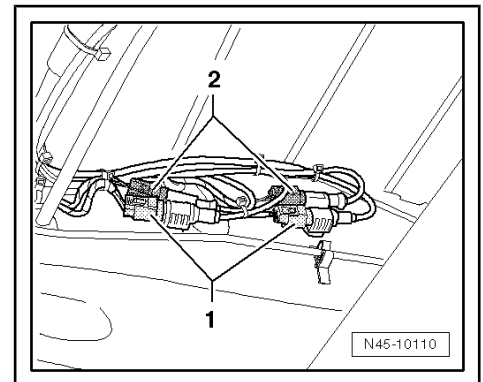
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



### Removing wire for brake pad wear indicator

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Disconnect connector -2- on right side of underfloor.
- ◆ Connector colour on left and right sides of vehicle: blue
- 1 - Connector for speed sensor wire to speed sensor (black or colourless)
- Separate all wiring connections for brake pad wear indicator to handbrake cable and axle beam.



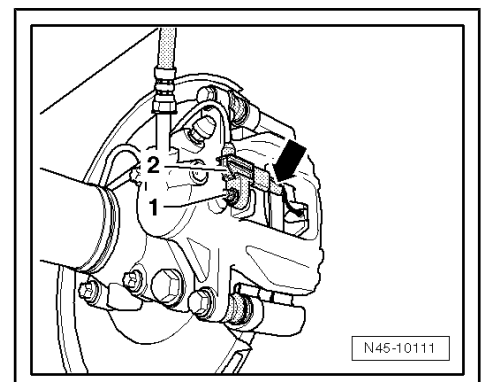
- Disconnect connector -arrow-.
- Unscrew bolt -1- and remove connector -2- from brake caliper.

### Installing wire for brake pad wear indicator

Install in reverse order.

#### Specified torques

Component	Specified torque
Connector to brake caliper	8 Nm



## 4.8 Removing and installing yaw rate sender - G202- and lateral acceleration sender - G200-



Note

- ◆ Not relevant for vehicles equipped with Bosch ESP9i.
- ◆ The yaw rate sender - G202- and lateral acceleration sender - G200- are integrated in ABS control unit - J104- .



**WARNING**

*Severe shocks (e.g. dropping, impact) may destroy the yaw rate sender - G202- and the lateral acceleration sender - G200-.*

**Removing yaw rate sender - G202- and lateral acceleration sender - G200-**

The yaw rate sender - G202- and the lateral acceleration sender - G200- are combined in one housing. This is installed under the driver seat.

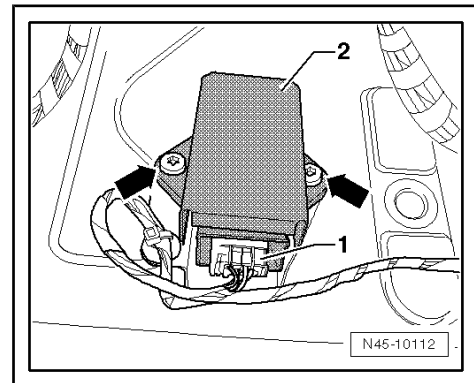
- Move driver seat to foremost position.
- Pull off connector -1-.
- Remove bolts -arrows-.
- Remove yaw rate sender - G202- and lateral acceleration sender - G200- -2-.

**Installing yaw rate sender - G202- and lateral acceleration sender - G200-**

Install in reverse order.

**Specified torques**

Component	Specified torque
Bolt yaw rate sender - G202- and lateral acceleration sender - G200- to base plate.	6 Nm



**4.9 Removing and installing steering angle sender - G85-**

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

**Removing and installing**

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



## 46 – Brakes - mechanism

### 1 Front brakes

⇒ [“1.1 Assembly overview - front brakes”, page 35](#)

⇒ [“1.2 Removing and installing brake pads/linings”, page 36](#)

⇒ [“1.3 Removing and installing brake caliper”, page 38](#)

#### 1.1 Assembly overview - front brakes



#### Note

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

#### 1 - Protective cap

#### 2 - Bolt

- Always renew after removing.
- 35 Nm

#### 3 - Brake hose

- Bolted to brake caliper.
- 35 Nm

#### 4 - Brake caliper

- Removing and installing ⇒ [page 38](#) .
- Repairing ⇒ [page 66](#) .

#### 5 - Brake pads

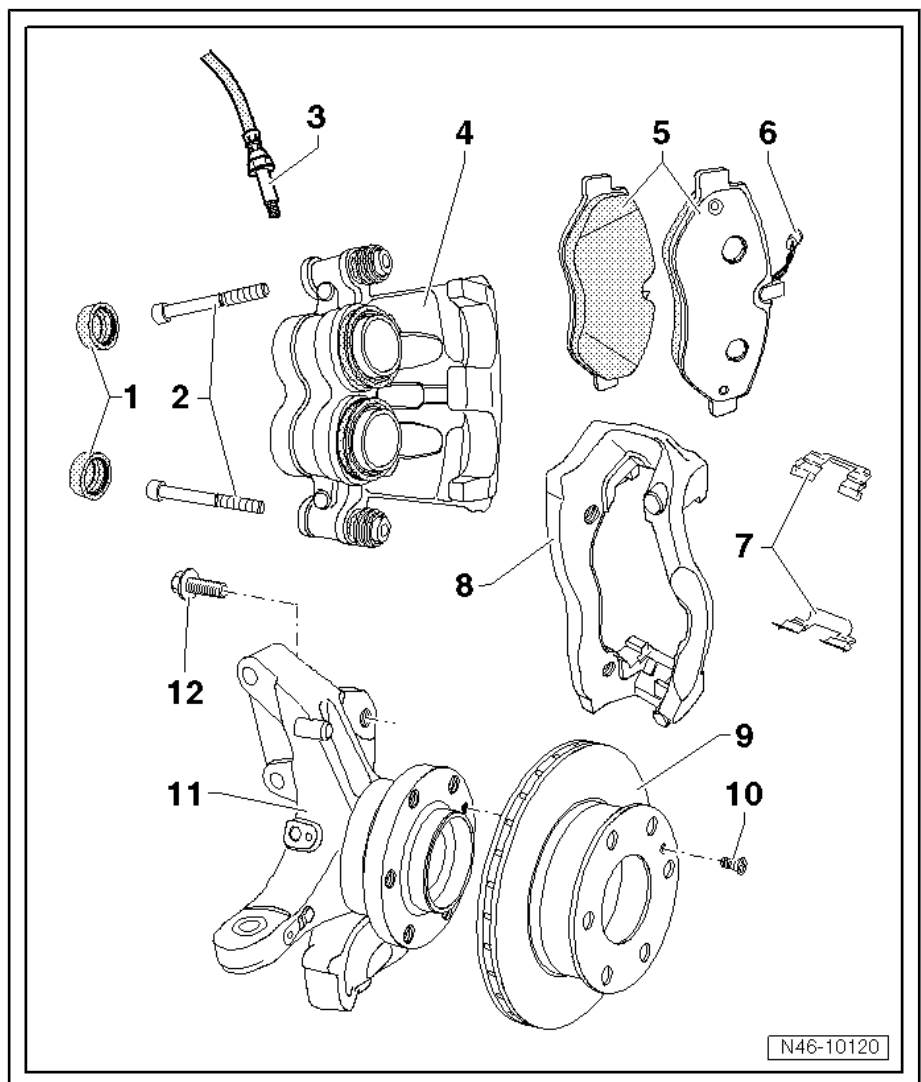
- Thickness: 13.5 mm not including backplate.
- Checking thickness ⇒ Maintenance ; Booklet 10.2 .
- Always replace on both sides
- Removing and installing ⇒ [page 36](#) .
- Pad wear limit: 2 mm without backplate (remaining pad thickness)

#### 6 - Brake pad wear indicator

- Only on outer brake pad

#### 7 - Pad retainer

- Always renew when changing pads.





## 8 - Brake carrier

## 9 - Brake disc

- Brake disc, 300 mm in diameter
- Internally ventilated.
- Thickness: 28 mm
- Wear limit: 25 mm.
- Always renew on both sides of an axle.

## 10 - Bolt

- 22 Nm

## 11 - Wheel bearing housing with wheel bearing/wheel bearing unit



### Note

- ◆ *Modified wheel bearing housing on Crafter 4MOTION with Achleitner four-wheel drive.*
- ◆ *Ensure correct installation position of front speed sensors, because malfunction may otherwise occur ⇒ [page 25](#).*

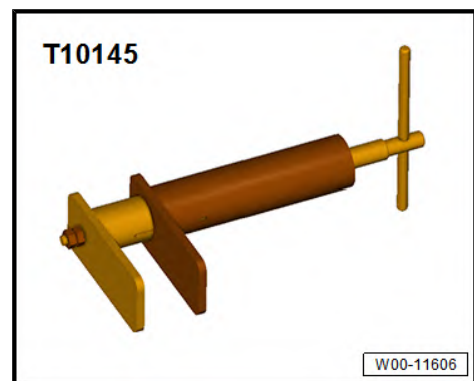
## 12 - Bolt

- 170 Nm

## 1.2 Removing and installing brake pads/linings

### Special tools and workshop equipment required

- ◆ Piston resetting appliance - T10145-



### Removing



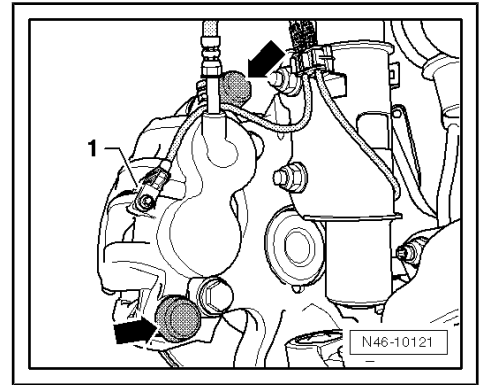
### Note

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

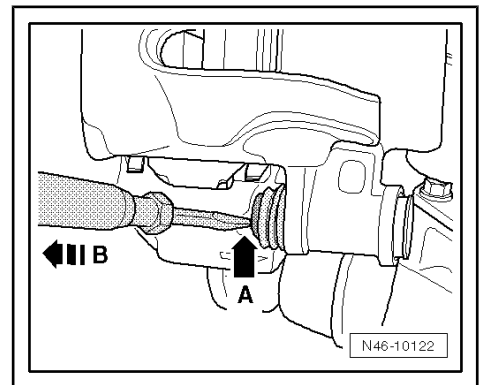
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.



- Disconnect connector -1- for brake pad wear indicator.
- Remove cover caps -arrows- and unscrew bolts for securing brake caliper.



- Insert screwdriver into notch -arrow A- on brake carrier.
- Press screwdriver in direction of -arrow B- to pull guide pin out of brake carrier.
- Remove brake caliper, guiding wire for brake pad wear indicator through opening in brake caliper.
- Secure brake caliper with wire so that the weight of the brake caliper does not stress or damage the brake hose.
- Remove brake pads from brake carrier sideways.
- Clean brake caliper housing.



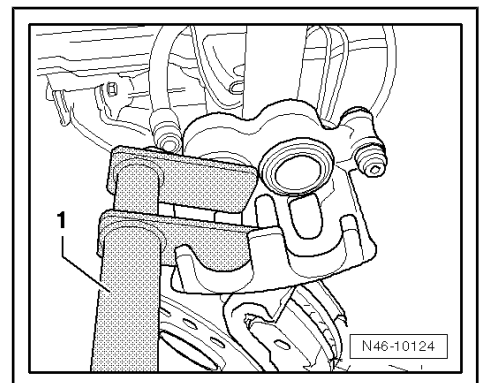
**Note**

*Only use methylated spirits to clean brake caliper housing.*

**Installing**

Before inserting new brake pads, press piston back into cylinder using piston resetting tool - T10145- . Before pressing piston back, draw off brake fluid from brake fluid reservoir with bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if reservoir has been topped up.

- Press both pistons back with piston resetting tool - T10145- -1-.

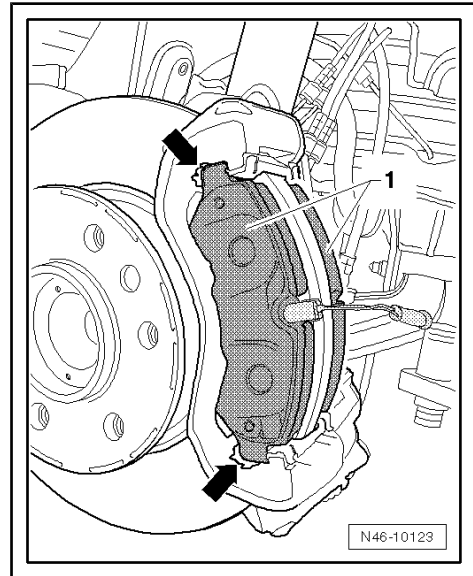




- Insert brake pads -1-.

Ensure that brake pads -1- are seated correctly in pad retainers -arrows-.

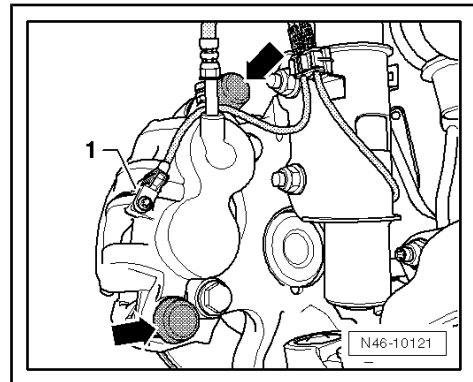
- Insert brake caliper housing. Make sure that guide pins engage correctly in brake carrier.
- Tighten new securing bolts to specified torque.



- Insert cover caps -arrows-.
- Connect connector -1- for brake pad wear indicator.
- Fit wheels.
- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Check brake fluid level after changing brake pads.

**Specified torques**

- ◆ ⇒ ["1.1 Assembly overview - front brakes", page 35](#)
- ◆ Running gear, axles, steering ⇒ Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

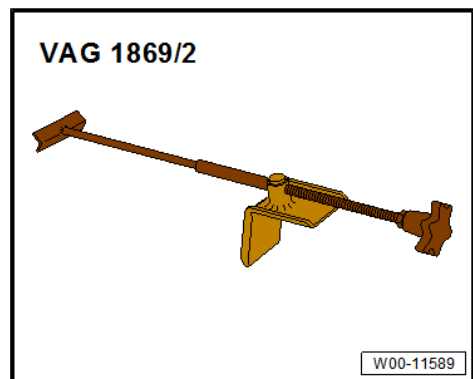


Component	Specified torque
Connector for brake pad wear indicator to brake caliper	8 Nm

**1.3 Removing and installing brake caliper**

**Special tools and workshop equipment required**

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





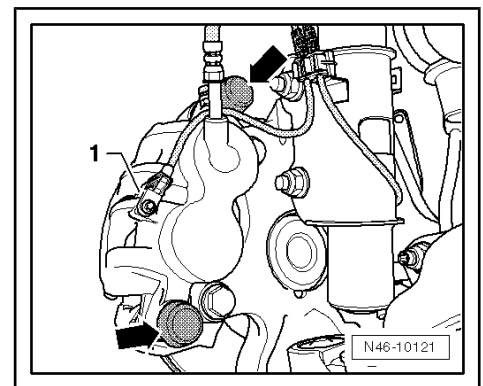
## Removing



### Note

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

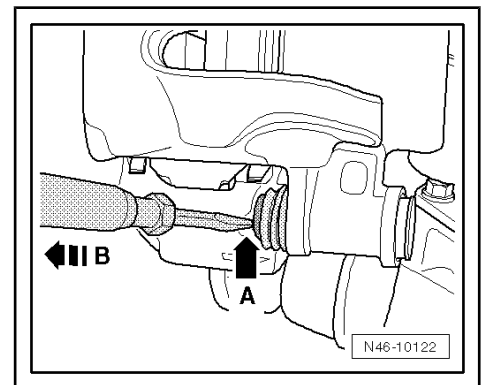
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.
- Connect bleeder bottle hose to brake caliper bleed valve and open bleed valve.
- Apply brake pedal depressor - V.A.G 1869/2- .
- Close bleed valve and remove bleed bottle.
- Unscrew brake hose.
- Disconnect connector -1- for brake pad wear indicator.
- Remove cover caps -arrows- and unscrew bolts for securing brake caliper.



- Insert screwdriver into notch -arrow A- on brake carrier.
- Press screwdriver in direction of -arrow B- to push guide pin out of brake carrier.
- Pull brake caliper from brake carrier.

## Installing

- Piston is pressed back.
- The brake pads are seated on the brake carrier.
- Insert brake caliper housing and make sure that guide pins engage correctly in brake carrier.
- Tighten new securing bolts to specified torque.





- Insert cover caps -arrows-.
- Connect connector -1- for brake pad wear indicator.
- Bolt brake hose to brake caliper.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system ⇒ [page 88](#) .
- Fit wheels.



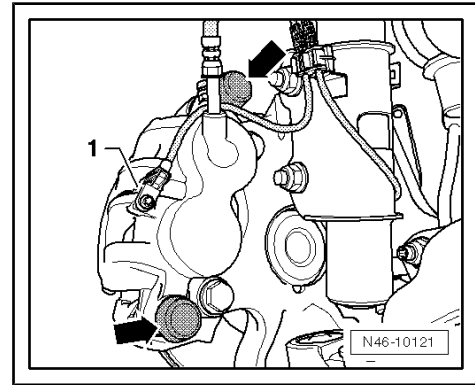
#### Note

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

#### Specified torques

- ◆ ⇒ [“1.1 Assembly overview - front brakes”, page 35](#)
- ◆ Running gear, axles, steering ⇒ Rep. gr. 44 ; Wheels, tyres;  
Specified torque for wheel bolts

Component	Specified torque
Connector for brake pad wear indicator to brake caliper	8 Nm





## 2 Rear brakes

⇒ [“2.1 Assembly overview - rear brake, Crafter 3.0 t and 3.5 t”, page 41](#)

⇒ [“2.2 Assembly overview - rear brake, Crafter 5.0 t”, page 43](#)

⇒ [“2.3 Assembly overview - brake shoes for handbrake, Crafter 3.0 t and 3.5 t”, page 44](#)

⇒ [“2.4 Assembly overview - brake shoes for handbrake, Crafter 5.0 t”, page 45](#)

⇒ [“2.5 Removing and installing brake pads, Crafter 3.0 t and 3.5 t”, page 45](#)

⇒ [“2.6 Removing and installing brake pads, Crafter 5.0 t”, page 47](#)

⇒ [“2.7 Removing and installing brake caliper, Crafter 3.0 t and 3.5 t”, page 50](#)

⇒ [“2.8 Removing and installing brake caliper, Crafter 5.0 t”, page 52](#)

⇒ [“2.9 Removing and installing brake shoes for handbrake, Crafter 3.0 t and 3.5 t”, page 54](#)

⇒ [“2.10 Removing and installing brake shoes for handbrake, Crafter 5.0 t”, page 55](#)

### 2.1 Assembly overview - rear brake, Crafter 3.0 t and 3.5 t



#### Note

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



**1 - Splash plate**

**2 - Rear axle shaft**

**3 - Brake disc**

- Brake disc, 288 mm in diameter
- Thickness: 16 mm
- Wear limit: 14 mm.
- When worn, renew on both sides of axle.
- Combined with drum for handbrake (Duo-Servo).

**4 - Bolt**

- 22 Nm

**5 - Brake carrier**

**6 - Pad retainer**

- Always renew when changing pads.
- Always set in place with angled lug pointing outwards.

**7 - Protective cap**

- Check for damage

**8 - Guide pin**

**9 - Brake pads**

- Thickness without backplate: 13 mm
- Pad wear limit: 2 mm without backplate (remaining pad thickness)
- Checking thickness  
⇒ Maintenance ; Booklet 10.2 .
- Always replace on both sides
- Removing and installing ⇒ [page 45](#) .

**10 - Brake pad wear indicator**

- Only on outer brake pad

**11 - Brake caliper**

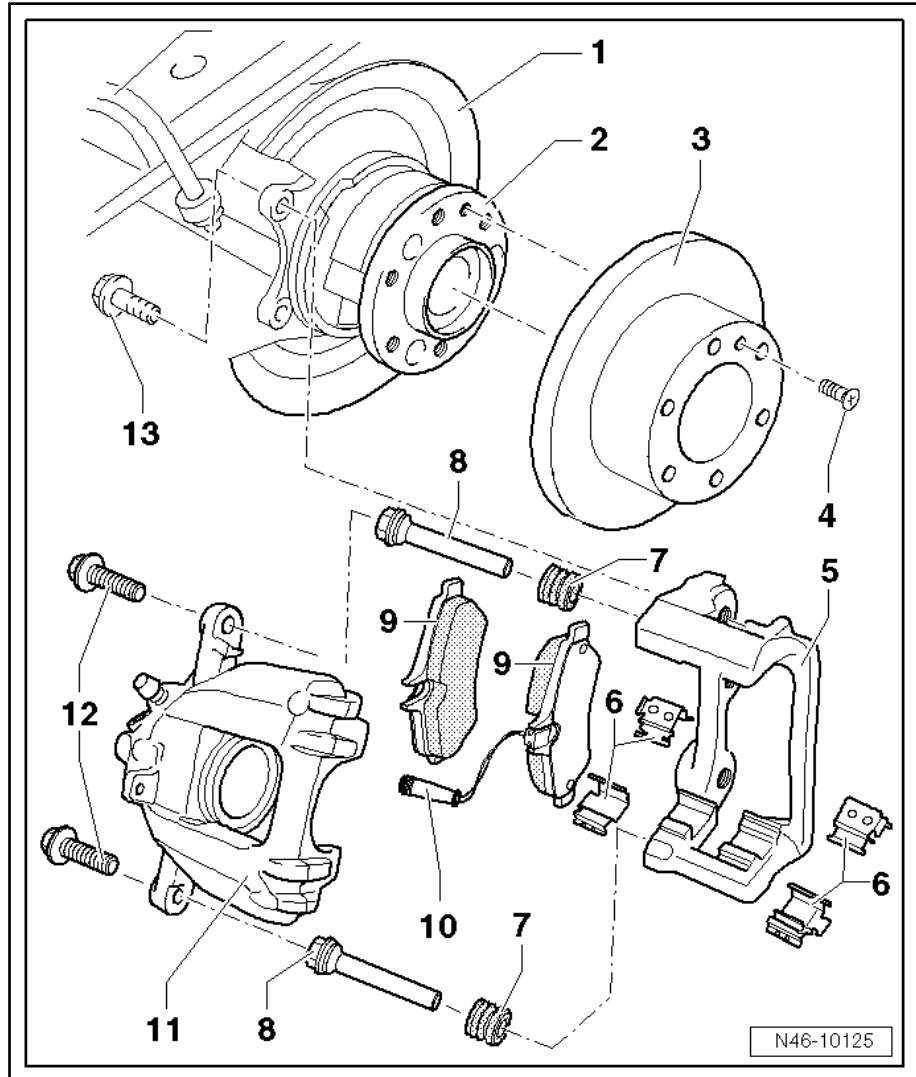
- Repairing ⇒ [page 69](#) .
- Removing and installing ⇒ [page 50](#) .

**12 - Bolt**

- Renew after removing
- 35 Nm

**13 - Bolt**

- Renew after removing
- 80 Nm +45°





## 2.2 Assembly overview - rear brake, Crafter 5.0 t

### Note

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

#### 1 - Splash plate

#### 2 - Rear axle shaft

#### 3 - Brake disc

- Brake disc, 303 mm in diameter
- Thickness: 28 mm
- Wear limit: 25 mm.
- When worn, renew on both sides of axle.
- Combined with drum for handbrake

#### 4 - Flange

#### 5 - Bolt

- Renew after removing
- 80 Nm +40°

#### 6 - Brake carrier

#### 7 - Pad retainers

- Always renew when changing pads.
- Always set in place with angled lug pointing outwards.

#### 8 - Protective cap

- Check for damage

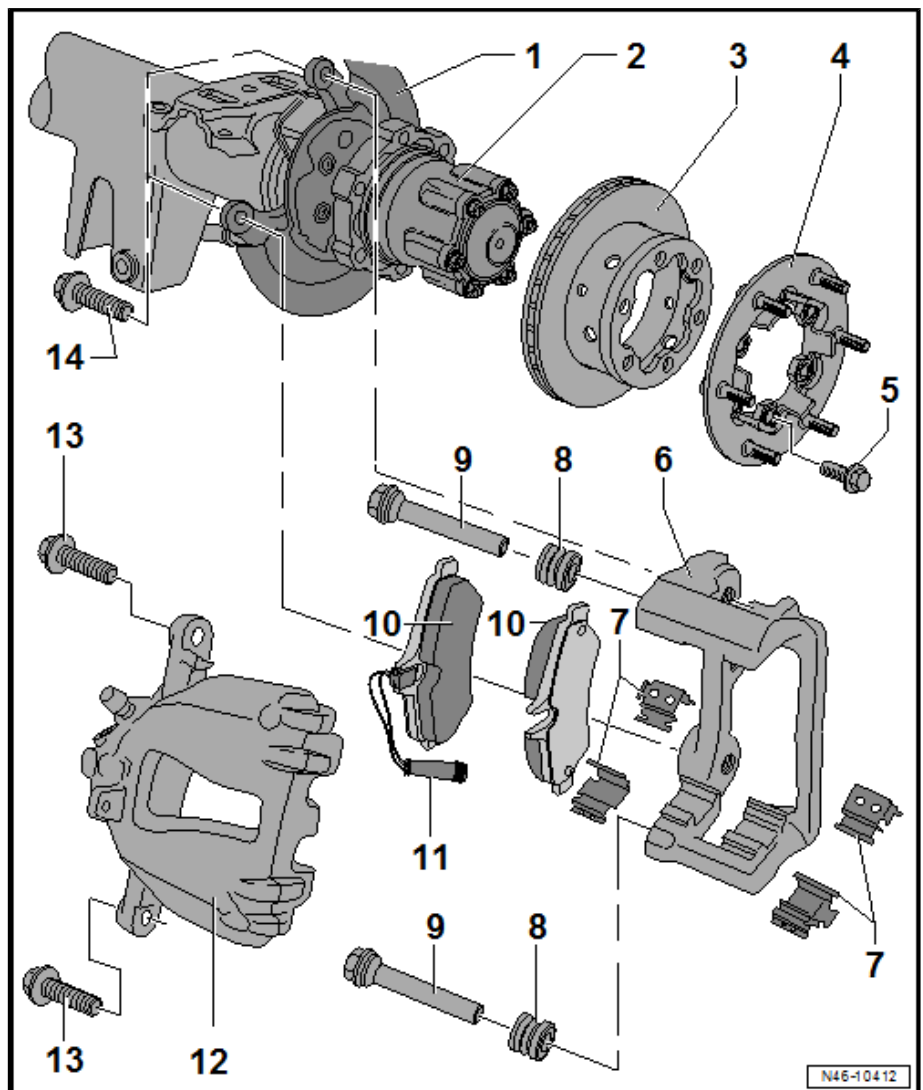
#### 9 - Guide pin

#### 10 - Brake pads

- Removing and installing ⇒ [page 47](#) .
- Thickness without backplate: 16 mm
- Pad wear limit: 2 mm without backplate (remaining pad thickness)
- Checking thickness ⇒ Maintenance ; Booklet 10.2 .
- Always replace on both sides

#### 11 - Brake pad wear indicator

- Only on inner brake pad





## 12 - Brake caliper

- Removing and installing ⇒ [page 52](#) .
- Repairing ⇒ [page 70](#) .

## 13 - Bolt

- Renew after removing
- 35 Nm

## 14 - Bolt

- Renew after removing
- 260 Nm

## 2.3 Assembly overview - brake shoes for handbrake, Crafter 3.0 t and 3.5 t

### 1 - Handbrake cable

### 2 - Pin

### 3 - Brake shoes for handbrake

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

### 4 - Retaining spring

### 5 - Expander

- Check for freedom of movement.
- Before installing brake shoes, attach to handbrake cable with pin ⇒ [Item 2 \(page 44\)](#) .

### 6 - Brake disc

- When worn, renew on both sides of axle.
- Combined with drum for handbrake

### 7 - Bolt

- 22 Nm

### 8 - Rear return spring

### 9 - Front return spring

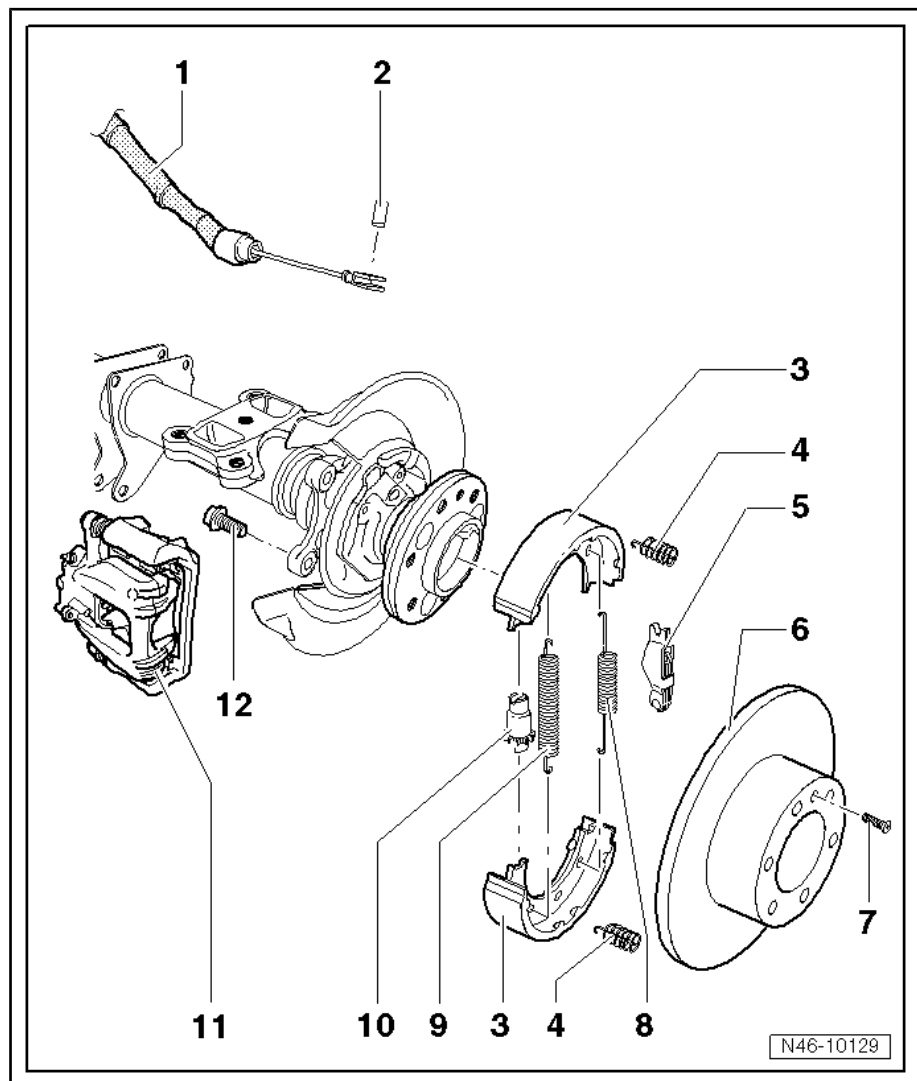
### 10 - Setting pinion for brake shoes

- Check for freedom of movement.

### 11 - Brake caliper

### 12 - Bolt

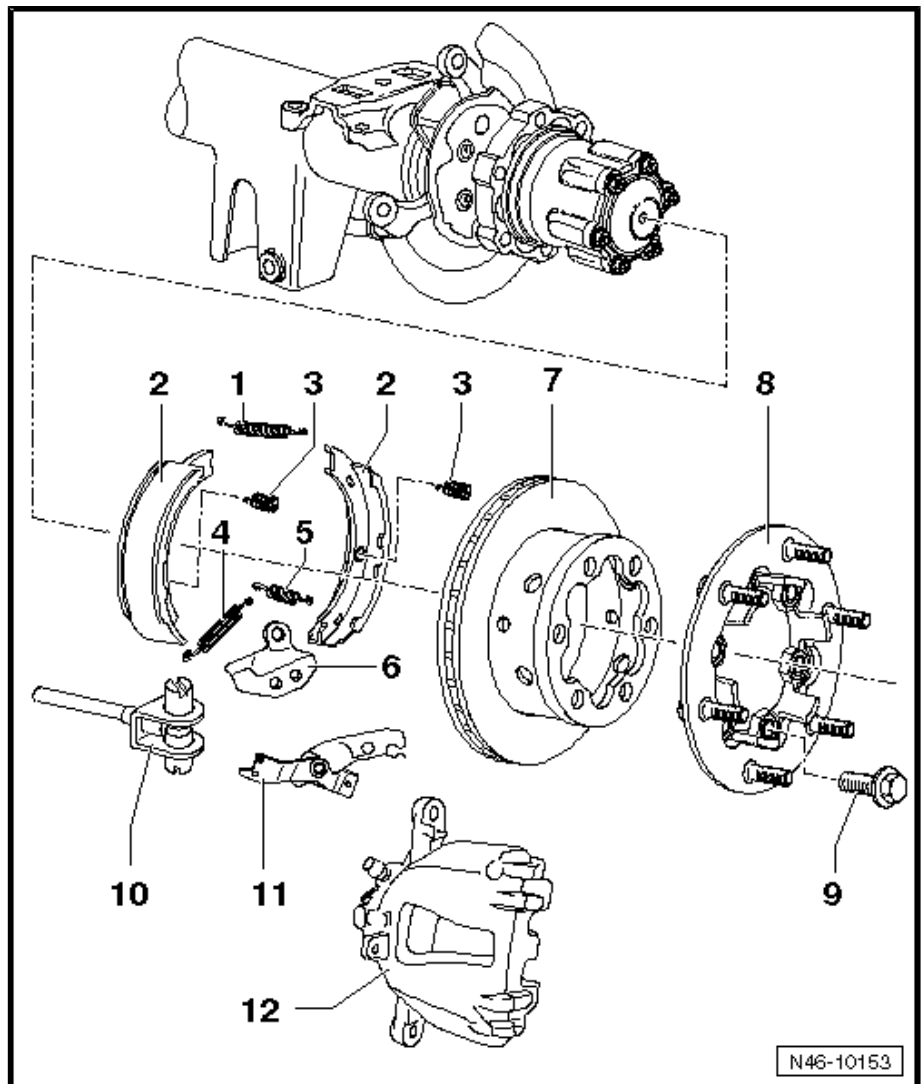
- Always renew after removing.
- 80 Nm +45°





## 2.4 Assembly overview - brake shoes for handbrake, Crafter 5.0 t

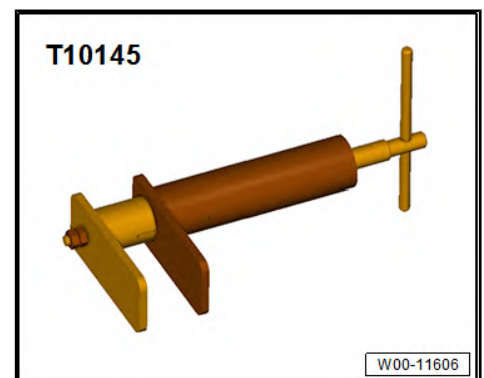
- 1 - Upper return spring
- 2 - Brake shoes for handbrake
  - Removing and installing  
⇒ [page 55](#) .
- 3 - Retaining spring
- 4 - Return spring
- 5 - Return spring
- 6 - Retaining plate
- 7 - Brake disc
  - When worn, renew on both sides of axle.
  - Combined with drum for handbrake
- 8 - Flange
- 9 - Bolt
  - Renew after removing
  - 80 Nm +40°
- 10 - Handbrake cable
- 11 - Expander
  - Check for freedom of movement.
  - Attach to handbrake cable ⇒ [Item 10 \(page 45\)](#) before installing brake shoes
- 12 - Brake caliper
  - Removing and installing  
⇒ [page 52](#) .



## 2.5 Removing and installing brake pads, Crafter 3.0 t and 3.5 t

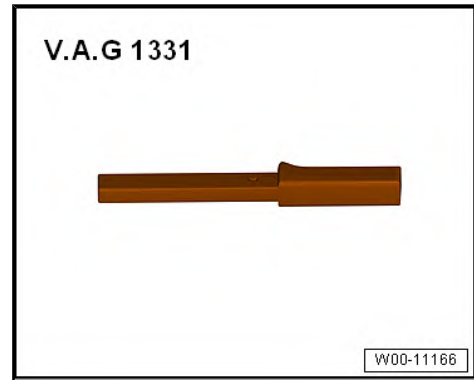
Special tools and workshop equipment required

- ◆ Piston resetting appliance - T10145-





- ◆ Torque wrench - V.A.G 1331-



## Removing



### Note

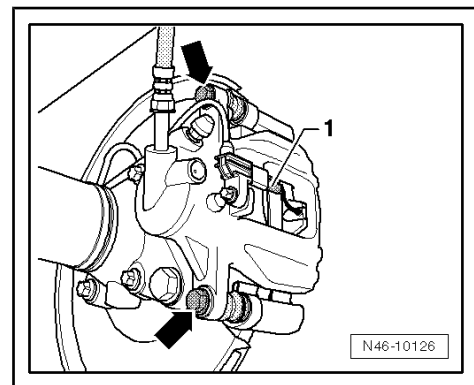
*Mark brake pads when removing if they are to be reused. Fit in same position when installing, or braking will be uneven.*

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.
- Disconnect connector -1- for brake pad wear indicator.
- Unscrew securing bolts -arrows- for brake caliper.
- Remove brake caliper, guiding wire for brake pad wear indicator through opening in brake caliper.
- Secure brake caliper with wire so that the weight of the brake caliper does not stress or damage the brake hose.
- Remove brake pads from brake carrier sideways.
- Clean brake carrier and brake caliper.



### Note

*Only use methylated spirits to clean brake caliper housing.*



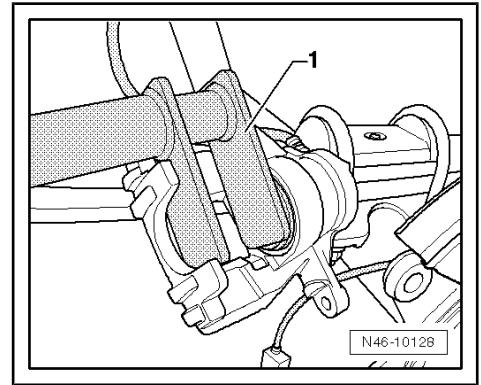
## Installing

Install in reverse order of removal, observing the following:

Before inserting new brake pads, press piston back into cylinder using piston resetting tool - T10145- . Before pressing piston back, draw off brake fluid from brake fluid reservoir with bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if reservoir has been topped up.



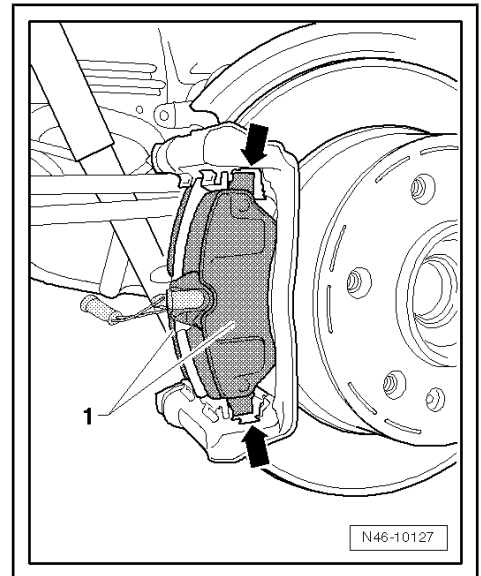
- Press pistons back with piston resetting tool - T10145- -1-.



- Insert brake pads -1-.

Ensure that brake pads -1- are seated correctly in pad retainers -arrows-.

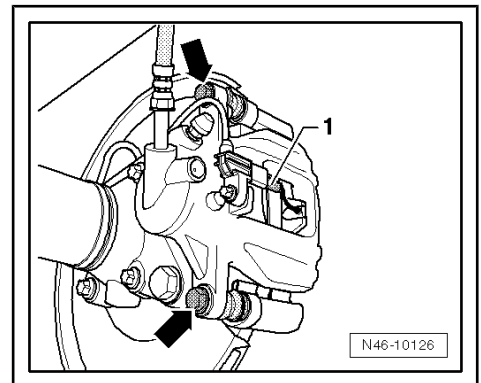
- Insert brake caliper housing.



- Tighten new securing bolts -arrows- to specified torque.
- Connect connector -1- for brake pad wear indicator.
- Fit wheels.
- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Check brake fluid level after changing brake pads.

#### Specified torques

- ◆ ⇒ ["2.1 Assembly overview - rear brake, Crafter 3.0 t and 3.5 t", page 41](#)
- ◆ Running gear, axles, steering ⇒ Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts



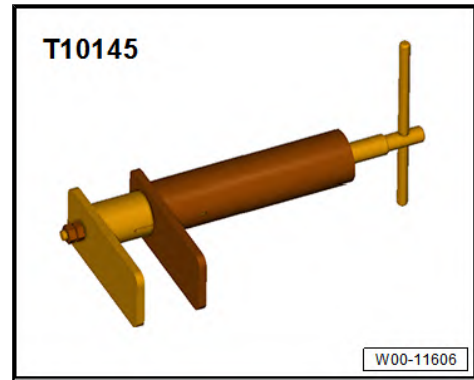
Component	Specified torque
Connector for brake pad wear indicator to brake caliper	8 Nm

## 2.6 Removing and installing brake pads, Crafter 5.0 t

Special tools and workshop equipment required



- ◆ Piston resetting appliance - T10145-



- ◆ Torque wrench - V.A.G 1331-



## Removing



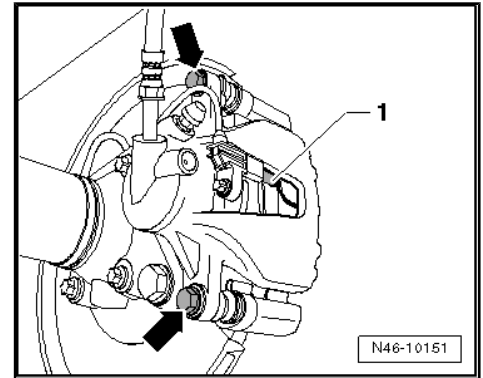
### Note

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

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.



- Disconnect connector -1- for brake pad wear indicator.
- Unscrew securing bolts -arrows- for brake caliper.
- Remove brake caliper, guiding wire for brake pad wear indicator through opening in brake caliper.
- Secure brake caliper with wire so that the weight of the brake caliper does not stress or damage the brake hose.
- Remove brake pads from brake carrier sideways.
- Clean brake carrier and brake caliper.



**i** Note

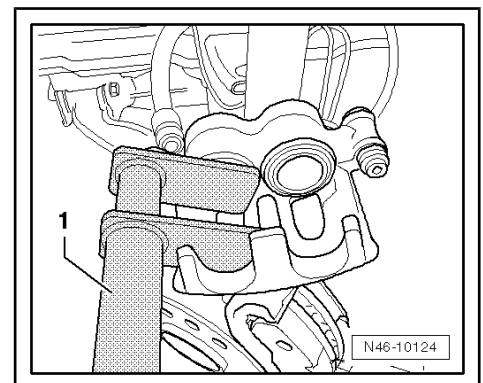
*Only use methylated spirits to clean brake caliper housing.*

**Installing**

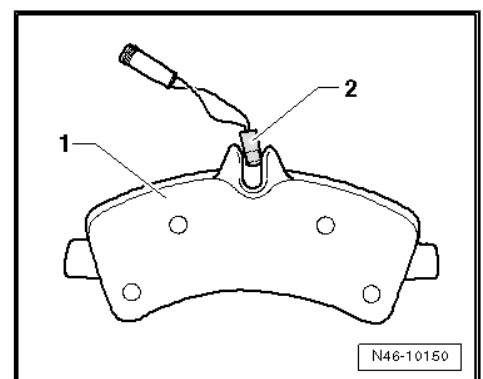
Install in reverse order of removal, observing the following:

Before inserting new brake pads, press piston back into cylinder using piston resetting tool - T10145- . Before pressing piston back, draw off brake fluid from brake fluid reservoir with bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if reservoir has been topped up.

- Press both pistons back with piston resetting tool - T10145- -1-.



- Carefully press brake pad wear indicator -2- onto stop in new brake pad -1-.

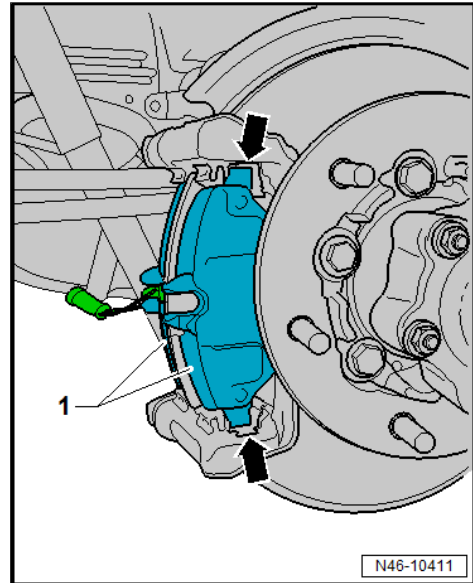




- Insert brake pads -1-.

Ensure that brake pads -1- are seated correctly in pad retainers -arrows-.

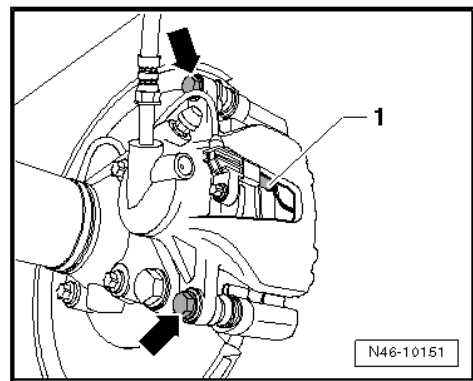
- Insert brake caliper housing.



- Tighten new securing bolts -arrows- to specified torque.
- Connect connector -1- for brake pad wear indicator.
- Fit wheels.
- ◆ After replacing brake pads/linings, depress brake pedal firmly several times with vehicle stationary so that the brake pads/linings are properly seated in their normal operating position.
- ◆ Check brake fluid level after changing brake pads.

#### Specified torques

- ◆ ⇒ ["2.2 Assembly overview - rear brake, Crafter 5.0 t", page 43](#)
- ◆ Running gear, axles, steering ⇒ Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

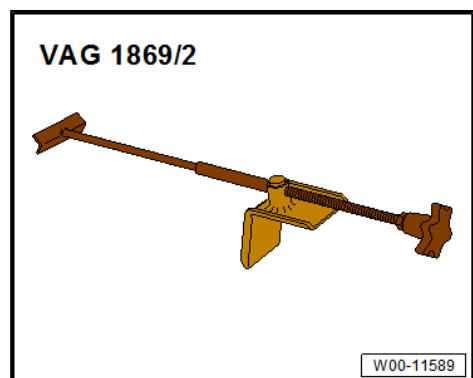


Component	Specified torque
Connector for brake pad wear indicator to brake caliper	8 Nm

## 2.7 Removing and installing brake caliper, Crafter 3.0 t and 3.5 t

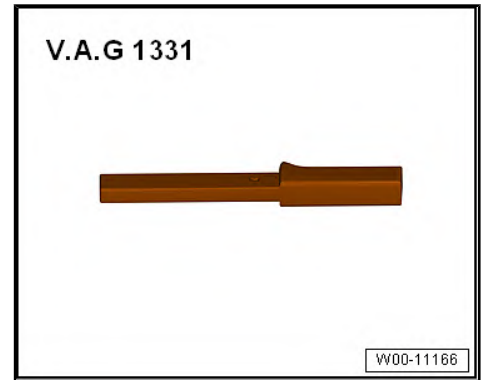
#### Special tools and workshop equipment required

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





- ◆ Torque wrench - V.A.G 1331-



## Removing

### Note

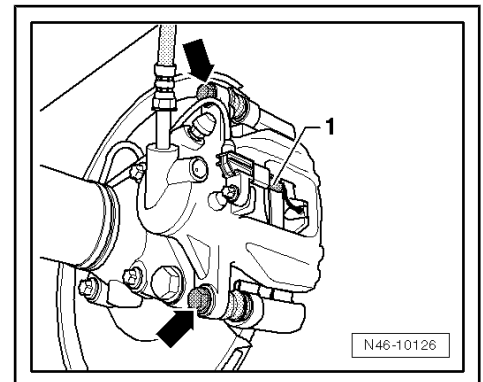
*This procedure applies only to exchanging the brake caliper or the following repair work on the brake caliper.*

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.
- Connect bleeder bottle hose to brake caliper bleed valve and open bleed valve.
- Apply brake pedal depressor - V.A.G 1869/2- .
- Close bleed valve and remove bleed bottle.
- Unscrew brake hose.
- Disconnect connector -1- for brake pad wear indicator.
- Unscrew securing bolts -arrows- for brake caliper.
- Remove brake caliper, guiding wire for brake pad wear indicator through opening in brake caliper.
- Pull brake caliper from brake carrier.

## Installing

Install in reverse order of removal, observing the following:

- Piston is pressed back.
- The brake pads are seated on the brake carrier.
- Insert brake caliper housing.





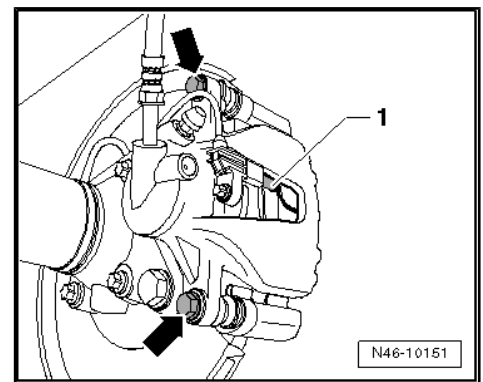


## Removing

### Note

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

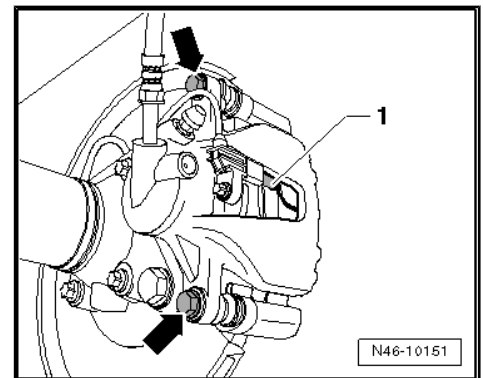
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.
- Connect bleeder bottle hose to brake caliper bleed valve and open bleed valve.
- Apply brake pedal depressor - V.A.G 1869/2- .
- Close bleed valve and remove bleed bottle.
- Unscrew brake hose.
- Disconnect connector -1- for brake pad wear indicator.
- Unscrew securing bolts -arrows- for brake caliper.
- Remove brake caliper, guiding wire for brake pad wear indicator through opening in brake caliper.
- Pull brake caliper from brake carrier.



## Installing

Install in reverse order of removal, observing the following:

- The pistons are pressed back.
- The brake pads are seated on the brake carrier.
- Insert brake caliper housing.
- Tighten securing bolts -arrows- to specified torque.
- Connect connector -1- for brake pad wear indicator.
- Screw brake line to brake caliper.
- Bleed brake system ⇒ [page 88](#) .
- Fit wheels.



### Note

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

## Specified torques

- ◆ ⇒ [page 43](#)
- ◆ Running gear, axles, steering ⇒ Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

Component	Specified torque
Brake hose to brake caliper	35 Nm



## 2.9 Removing and installing brake shoes for handbrake, Crafter 3.0 t and 3.5 t

Special tools and workshop equipment required

- ◆ Hook - 3438-



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

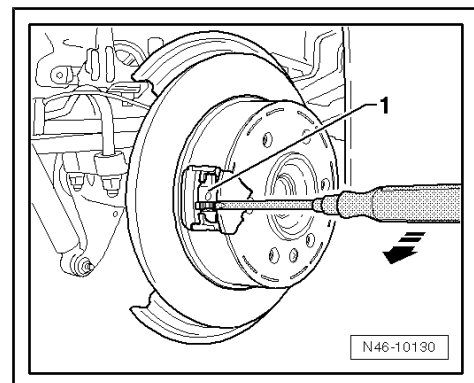
### Removing



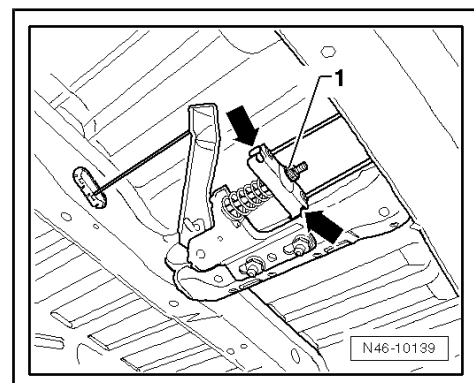
#### Note

*Brake shoes may come apart, fall and be damaged.*

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose.
- Reset brake in order to be able to remove brake disc.
- To do this, insert a screwdriver through hole in brake disc and position it on setting pinion for brake shoes -1-.
- Turn setting pinion for brake shoes -1- by moving screwdriver in direction of -arrow-.
- Remove brake discs.

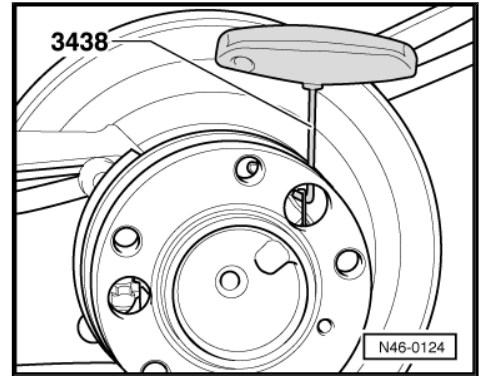


- Turn nut -1- to relieve rear handbrake cables.
- Detach handbrake cables -arrows-.





- Unhook return springs with hook - 3438- .



- Press retaining spring -1- with pliers -2- in direction of -arrow A- and turn so that hook -3- can be removed through slot -arrow B- on rear side of cover plate.

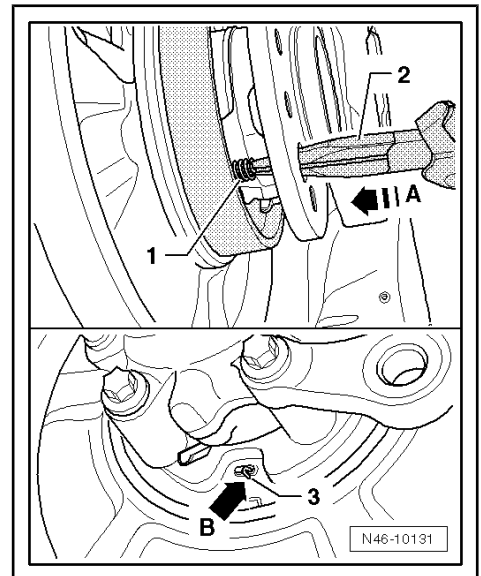
**i Note**

*Only the lower retaining spring is shown on the illustration. A retaining spring is also installed in the upper section of the brake shoes; this also has to be removed.*

- Pull brake shoes apart as far as necessary and remove forwards (in direction of travel).

**Installing**

Install in reverse order of removal, observing the following:



- Preassemble brake shoes.

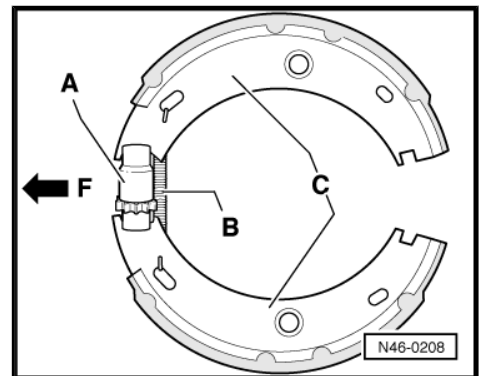
- A - Setting pinion
- B - Front return spring
- C - Brake shoes
- F - Direction of travel

- Pull brake shoes apart as far as necessary and insert backwards (opposite direction of travel).

Continue installation in reverse order.

**Specified torques**

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

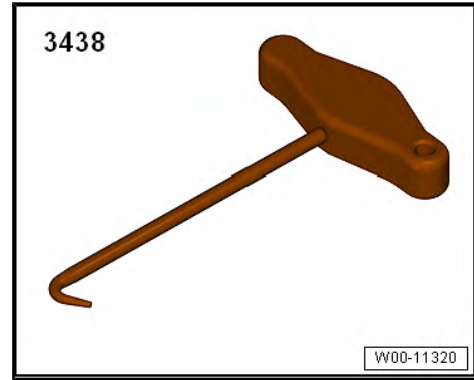


## 2.10 Removing and installing brake shoes for handbrake, Crafter 5.0 t

Special tools and workshop equipment required



◆ Hook - 3438-



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

**Removing**



**Note**

*Brake shoes may come apart, fall and be damaged.*

- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Remove wheels.
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose.

Reset brake in order to be able to remove brake disc.

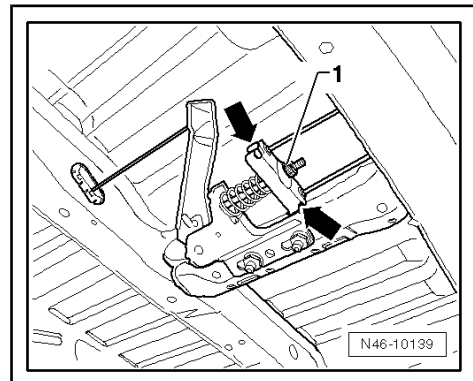
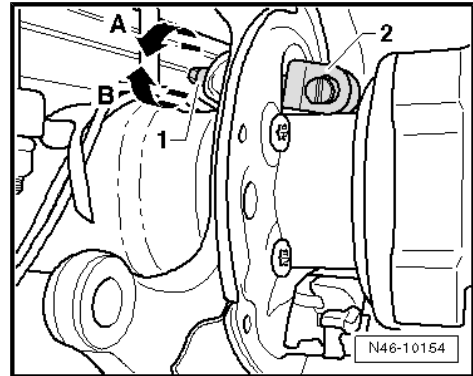
- To reset brake, turn adjuster screw -1- of adjustment jig -2- in direction of -arrow B- using a commercially available spanner.



**Note**

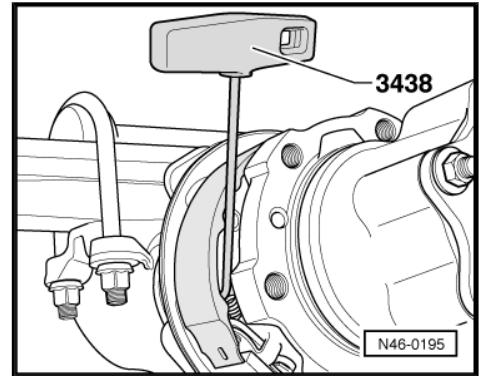
*The brake shoes are not shown to improve the illustration clarity of the adjustment jig -2-.*

- Remove brake discs.
- Turn nut -1- to relieve rear handbrake cables.
- Detach handbrake cables -arrows-.





- Unhook return springs with hook - 3438- .



- Press retaining spring -1- with pliers -2- in direction of -arrow A- and turn so that hook -3- can be removed through slot -arrow B- on rear side of cover plate.

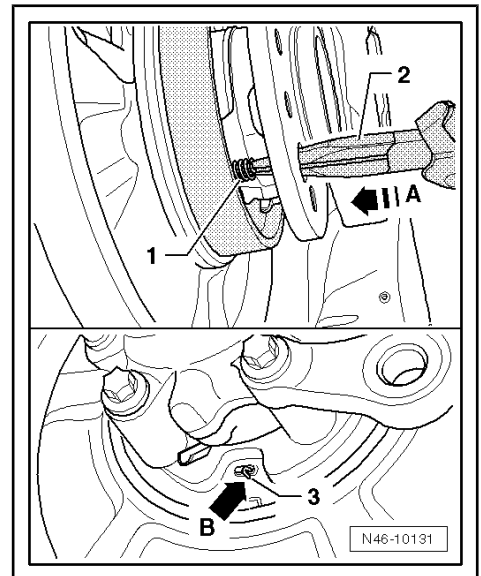
**i Note**

*Only one retaining spring is shown on the illustration. The other brake shoe is also fitted with a retaining spring that must be removed as well.*

- Pull brake shoes apart as far as necessary and remove forwards (in direction of travel).

**Installing**

Install in reverse order of removal, observing the following:



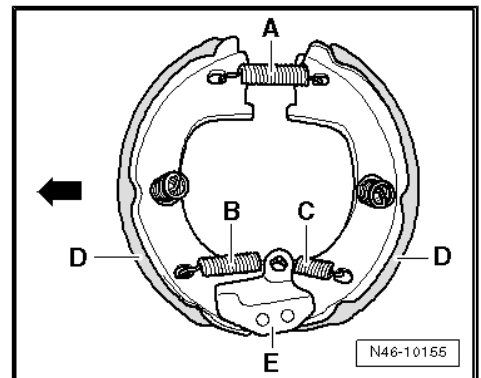
- Preassemble brake shoes.
- A - Return spring with "longest length"
- B - Return spring with "middle length"
- C - Return spring with "shortest length"
- D - Brake shoes
- E - Retaining plate
- Pfeil - Direction of travel

- Pull brake shoes apart as far as necessary and insert backwards (opposite direction of travel).

Continue installation in reverse order.

**Specified torques**

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





### 3 Handbrake

⇒ [“3.1 Assembly overview - handbrake lever”, page 58](#)

⇒ [“3.2 Removing and installing handbrake lever”, page 59](#)

⇒ [“3.3 Removing and installing front handbrake cable”, page 60](#)

⇒ [“3.4 Note on adjusting handbrake”, page 60](#)

⇒ [“3.5 Adjusting front handbrake cable”, page 60](#)

⇒ [“3.6 Adjusting brake shoes for handbrake and rear handbrake cables, Crafter 3.0 t and 3.5 t”, page 61](#)

⇒ [“3.7 Adjusting brake shoes for handbrake and rear handbrake cables, Crafter 5.0 t”, page 62](#)

#### 3.1 Assembly overview - handbrake lever

1 - Front trim

2 - Rear trim

3 - Bolt

□ 60 Nm

4 - Bolt

□ 10 Nm

5 - Handbrake warning switch  
- F9-

6 - Handbrake cable, front

□ Adjusting ⇒ [page 60](#) .

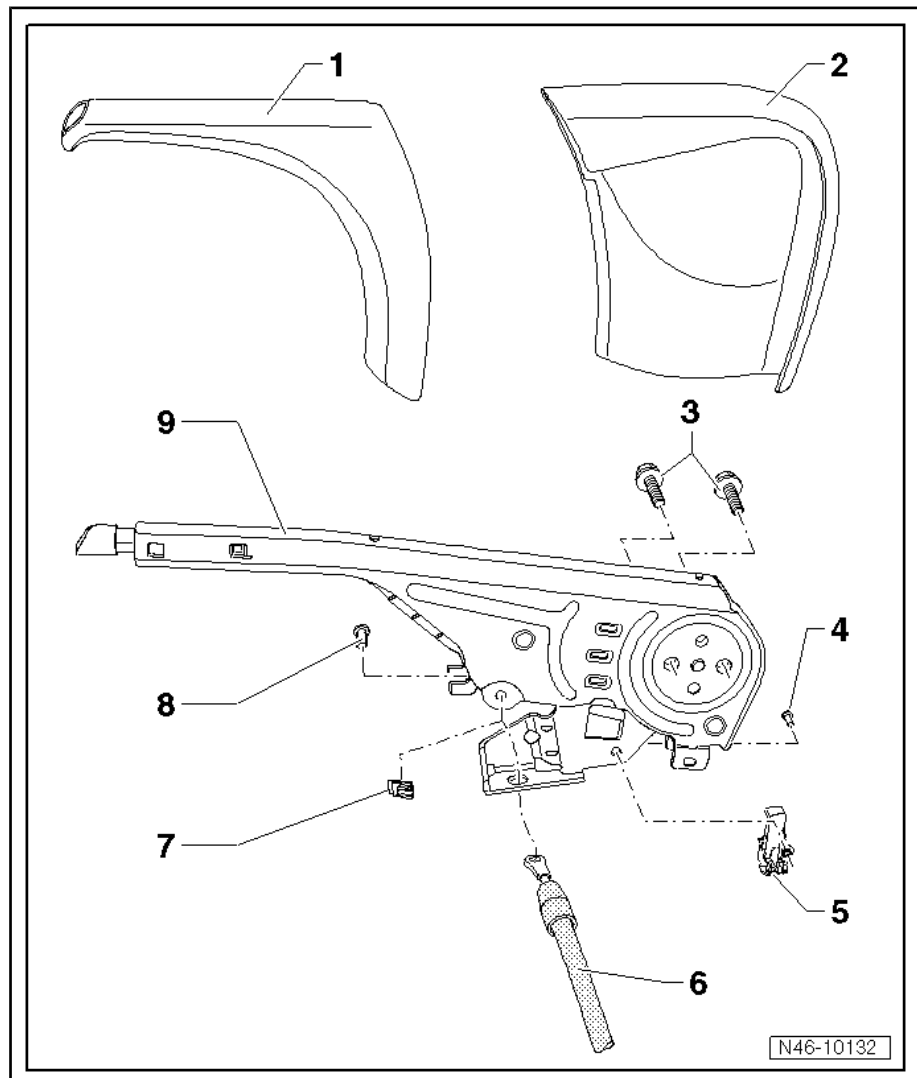
□ Removing and installing  
⇒ [page 60](#) .

7 - Retaining clip

8 - Pin

9 - Handbrake lever

□ Removing and installing  
⇒ [page 59](#) .

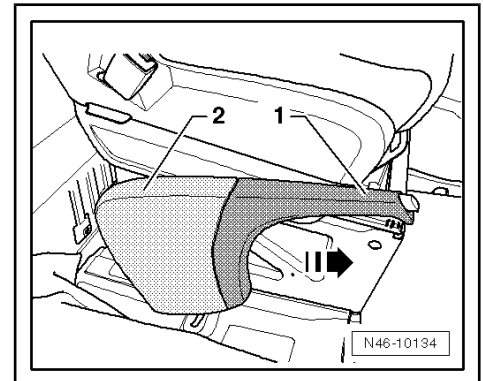




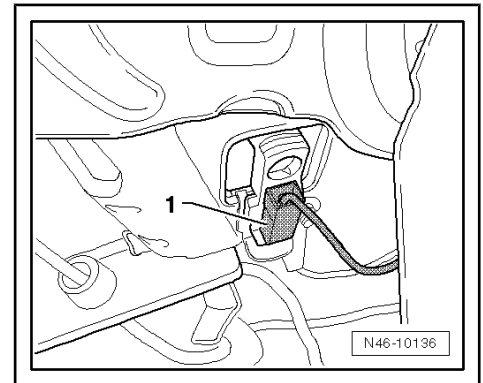
## 3.2 Removing and installing handbrake lever

### Removing

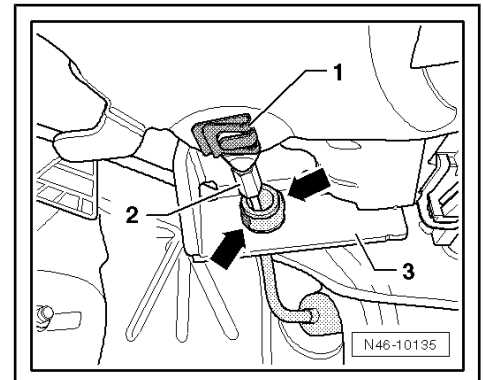
- Pull front trim -1- off handbrake lever in -direction of arrow-.
- Remove rear trim -2- from handbrake lever.
- The handbrake lever is in its lowest position, and is not applied.



- Disconnect connector -1- on handbrake warning switch - F9- .



- Remove retaining clip -1- and pull out securing pin for front handbrake cable out of handbrake lever.
- Press both lugs -arrows- together and slide front handbrake cable -2- out of handbrake lever -3-.



- Separate connection -1-.
- Unscrew bolts -arrows- and remove handbrake lever -2-.

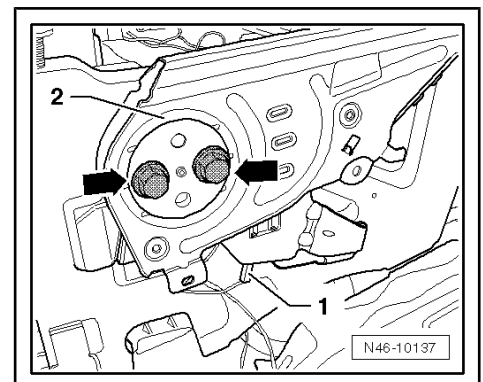
### Installing

Install in reverse order.

- Adjusting front handbrake cable ⇒ [page 60](#) .

### Specified torques

- ◆ ⇒ [“3.1 Assembly overview - handbrake lever”, page 58](#)

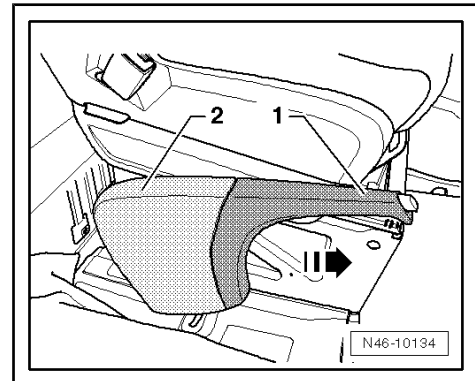




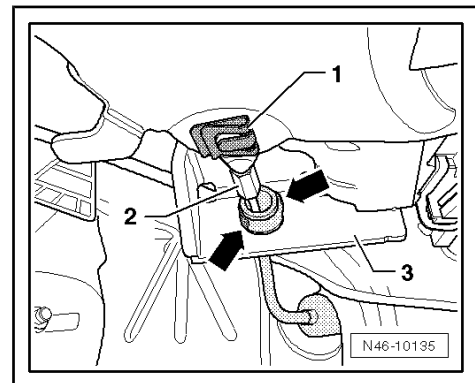
### 3.3 Removing and installing front handbrake cable

#### Removing

- Remove rear trim -2- from handbrake lever.
- The handbrake lever is in its lowest position, and is not applied.



- Remove retaining clip -1- and pull out securing pin for front handbrake cable out of handbrake lever.
- Press both lugs -arrows- together and slide front handbrake cable -2- out of handbrake lever -3-.
- Push boot of handbrake cable and handbrake cable out through underbody.
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .

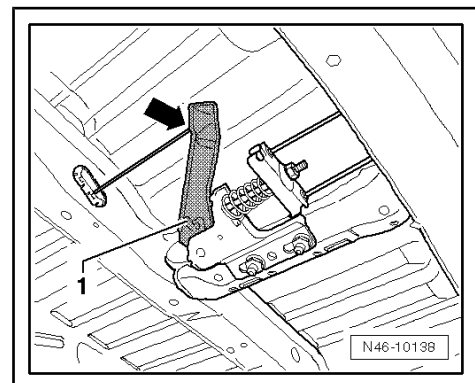


- Detach front handbrake cable from lever -1- -arrow-.
- Pull out front handbrake cable through underbody, in direction of travel.

#### Installing

Install in reverse order of removal, observing the following:

- Adjusting front handbrake cable ⇒ [page 60](#) .



### 3.4 Note on adjusting handbrake



#### Note

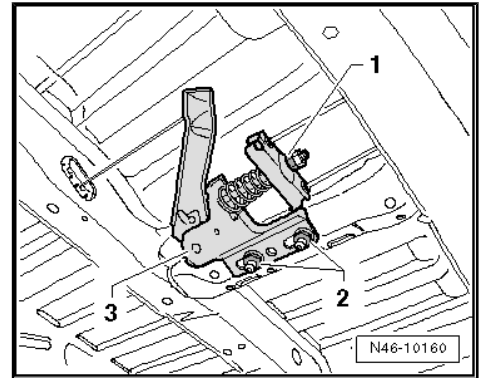
*Before adjusting handbrake, first adjust brake shoes for handbrake, then adjust front handbrake cable.*

### 3.5 Adjusting front handbrake cable

- Release handbrake lever.
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .



- Unscrew nuts -2- from bracket -3-, and push bracket in direction of travel.



- Push bracket backwards until there is 6 mm clearance between lever -1- and bracket -3-.

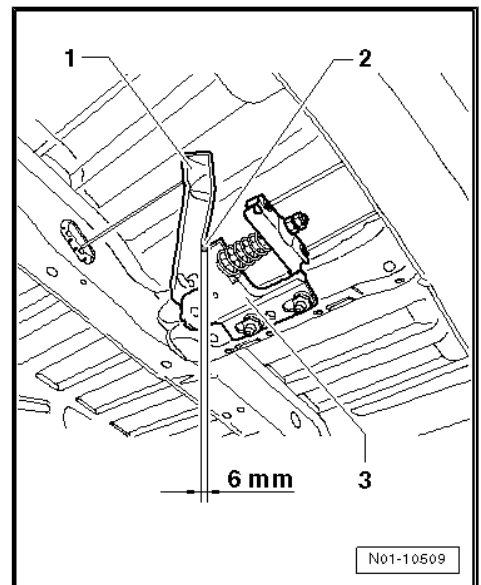
**i** Note

*A 6 mm drill may be used as gauge.*

- Tighten nuts of bracket.
- Pull handbrake lever on 4 notches.
- Release handbrake lever.
- Check that both wheels turn freely.

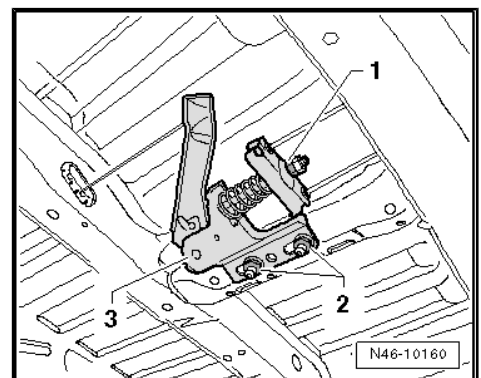
**Specified torques**

Component	Specified torque
Nut for bracket to body	40 Nm



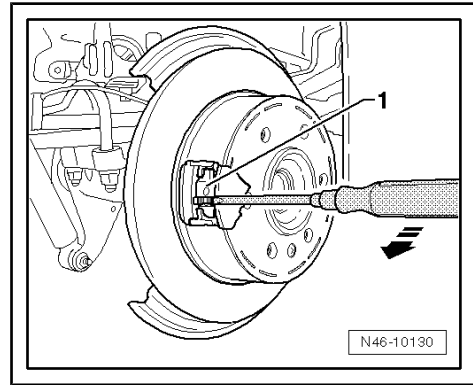
### 3.6 Adjusting brake shoes for handbrake and rear handbrake cables, Crafter 3.0 t and 3.5 t

- Unscrew and remove one wheel bolt from each of the rear axle wheels.
- Release handbrake.
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Unscrew nuts -2- from bracket -3-, and push bracket in direction of travel.

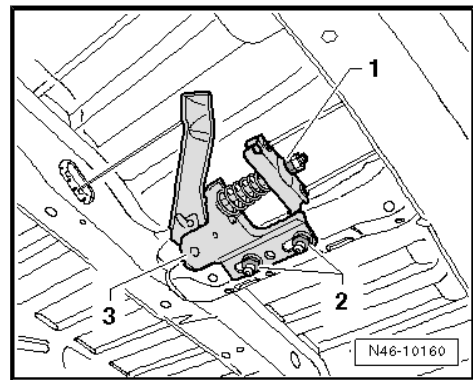




- Turn wheel until setting pinion -1- can be seen through hole for wheel bolt.
- Use screwdriver to turn setting pinion -1- counter to direction of -arrow- until wheel is fixed.
- Turn back setting pinion by 3 teeth in direction of -arrow-.
- Adjust front handbrake cable ⇒ [page 60](#) .



- Loosen lock nut, and tighten nut -1- until rear handbrake cables no longer sag.
- Pull handbrake lever on 4 notches.
- Release handbrake lever.
- Check that both wheels turn freely.
- Lock loosened nuts again.
- Install removed wheel bolts.



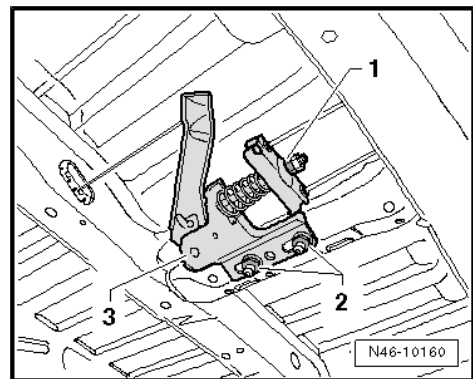
#### Specified torques

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

Component	Specified torque
Nut for bracket to body	40 Nm

### 3.7 Adjusting brake shoes for handbrake and rear handbrake cables, Crafter 5.0 t

- Release handbrake.
- Raise vehicle ⇒ Maintenance ; Booklet 10.2 .
- Loosen nuts -2- of bracket -3-.
- Push bracket -3- in direction of travel.





- Turn adjuster screw -1- of adjustment jig -2- in direction of -arrow A- using a commercially available spanner until wheel is fixed.

**i Note**

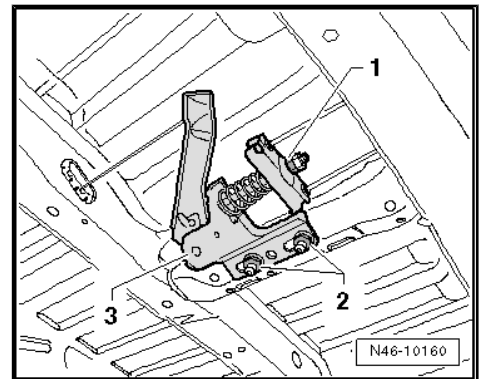
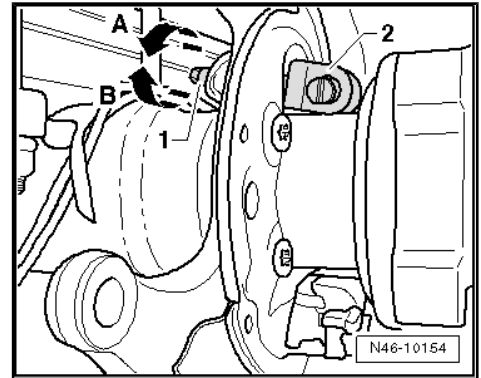
*The brake shoes are not shown to improve the illustration clarity of the adjustment jig.*

- Loosen adjustment jig by approx. 3 notches in direction of -arrow B-.
- Tighten nut -1- until rear handbrake cables no longer sag.
- Tighten lock nut.
- Adjust front handbrake cable => [page 60](#) .
- Pull handbrake lever on 4 notches.
- Release handbrake lever.
- Check that both wheels turn freely.

**Specified torques**

- ◆ Running gear, axles, steering => Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

Component	Specified torque
Nut for bracket to body	40 Nm





## 4 Brake pedal

⇒ "4.1 Assembly overview - brake pedal", page 64

⇒ "4.2 Removing and installing brake pedal", page 64

### 4.1 Assembly overview - brake pedal



#### WARNING

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

#### 1 - Brake light switch - F-

- ❑ Removing and installing  
⇒ [page 76](#) .

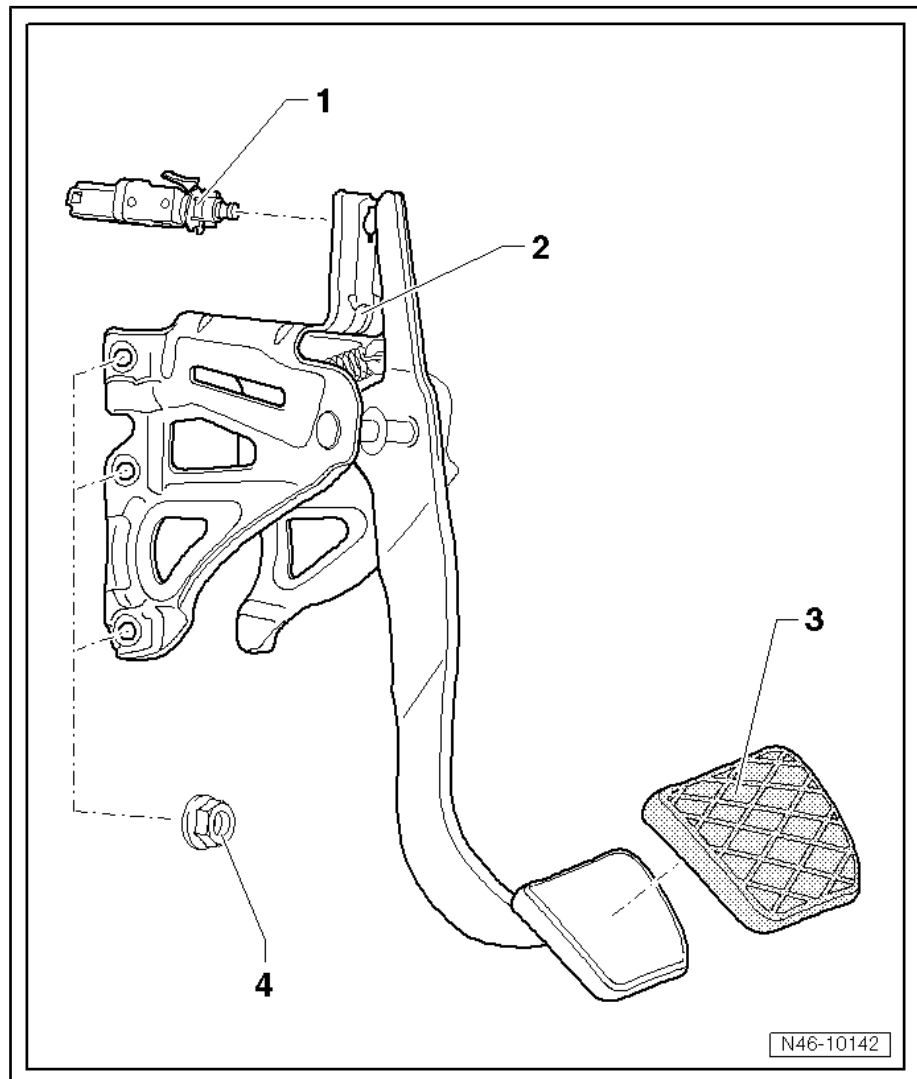
#### 2 - Brake pedal with mounting bracket

- ❑ Removing and installing  
⇒ [page 64](#) .

#### 3 - Cap

#### 4 - Nut

- ❑ Always renew after removing.
- ❑ 25 Nm



### 4.2 Removing and installing brake pedal

#### Removing

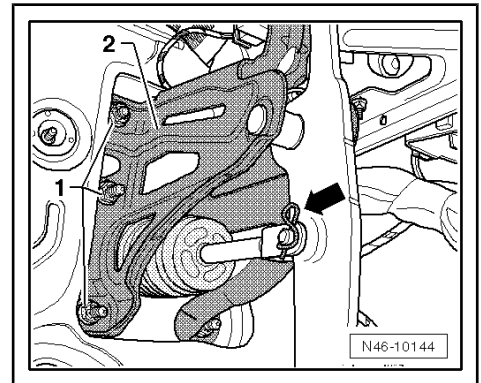
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - steering column trim .



- Remove brake light switch - F- from mounting bracket  
⇒ [page 76](#) .
- Remove securing spring -arrow- on pin for connecting fork head to brake pedal.
- Remove pin for connecting fork head to brake pedal.
- Unscrew nuts -1- on both sides of mounting bracket.
- Remove brake pedal together with mounting bracket -2-.

### Installing

Install in reverse order.





## 47 – Brakes - hydraulics

### 1 Front brake caliper

⇒ [“1.1 Assembly overview - front brake caliper”, page 66](#)

⇒ [“1.2 Removing and installing front brake caliper piston”, page 67](#)

#### 1.1 Assembly overview - front brake caliper



#### Note

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

#### 1 - Brake caliper housing

#### 2 - Brake hose

- Tighten at brake caliper to 35 Nm.

#### 3 - Bleeder valve

- 14 Nm

#### 4 - Dust cap

#### 5 - Protective cap

- Take care not to damage when inserting.

#### 6 - Guide pin

**! WARNING**

Two different types of guide bushes are installed. Always ensure that the guide bush with the moulded insert is installed »on top« (on bleeder valve).

#### 7 - Sealing ring

- Removing and installing ⇒ [page 67](#) .

#### 8 - Piston

- Removing and installing ⇒ [page 67](#) .

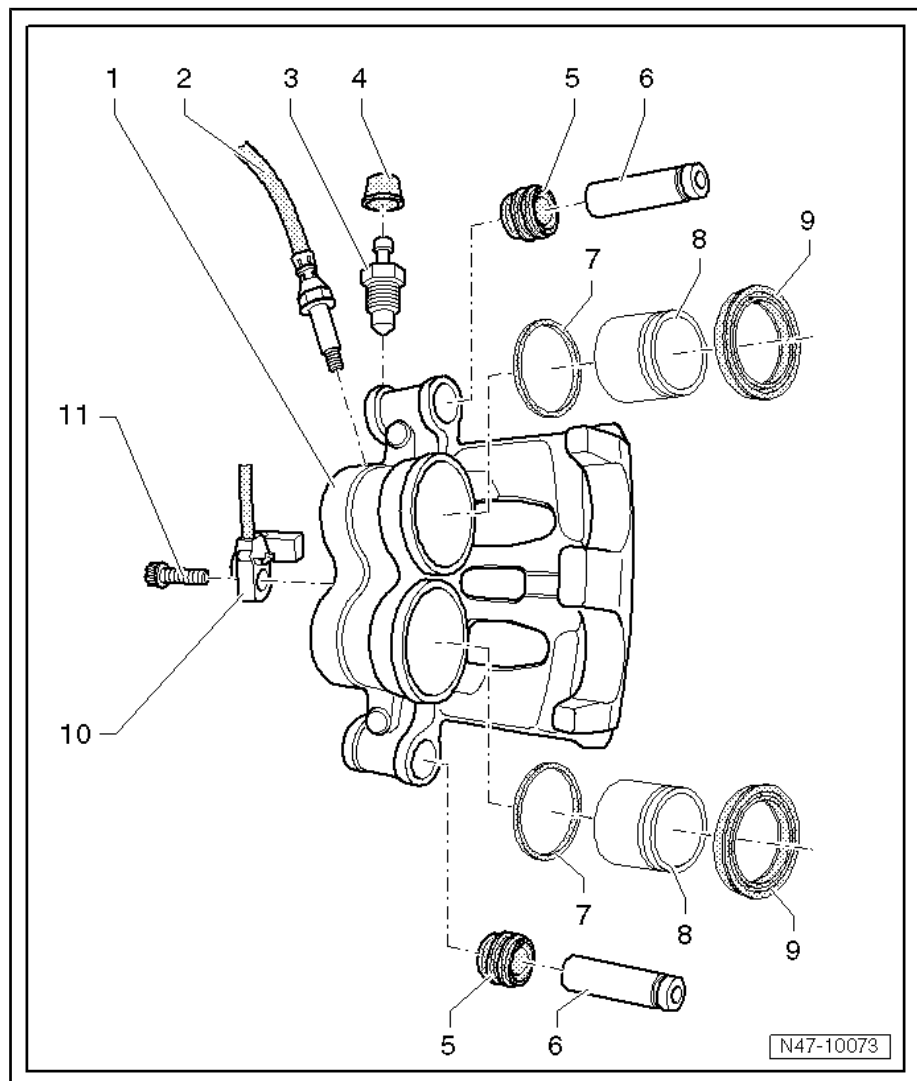
#### 9 - Protective cap

- Take care not to damage when inserting piston.

#### 10 - Connector for brake pad wear indicator

#### 11 - Bolt

- 8 Nm

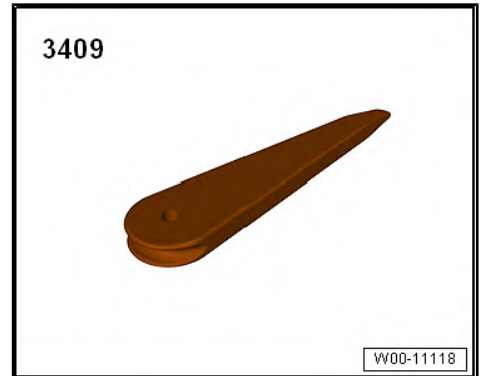




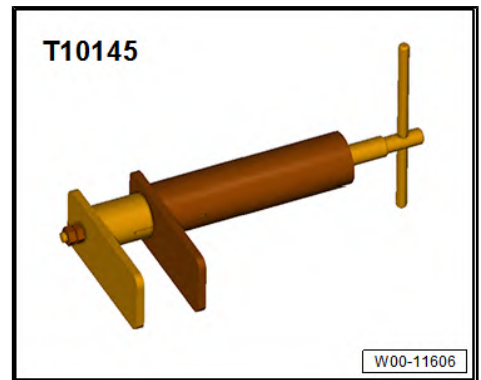
## 1.2 Removing and installing front brake caliper piston

### Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



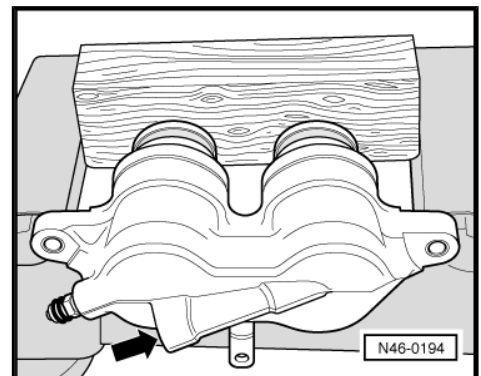
- ◆ Piston resetting appliance - T10145-



### Removing

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

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



- Remove seal using removal wedge - 3409- .

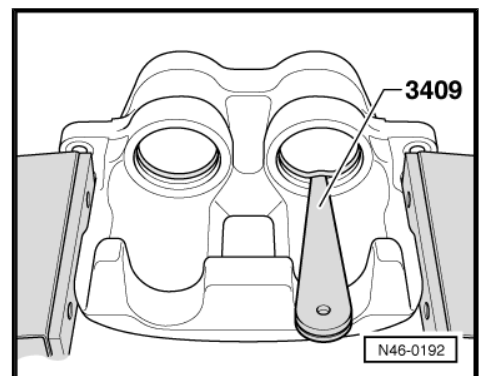
When removing ensure that the surface of the cylinder is not damaged.

### Installing



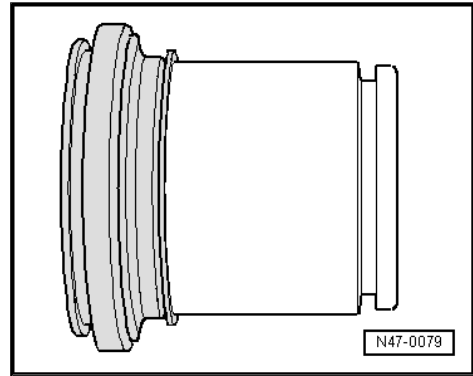
*Only use methylated spirits to clean brake caliper housing.*

- Apply thin coat of assembly paste - G 052 150 A2- to piston and seal before installing.
- Insert oil seal in brake caliper housing.



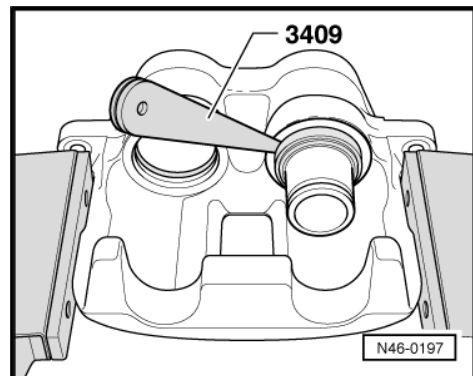


- Place protective cap with outer sealing lip on piston.



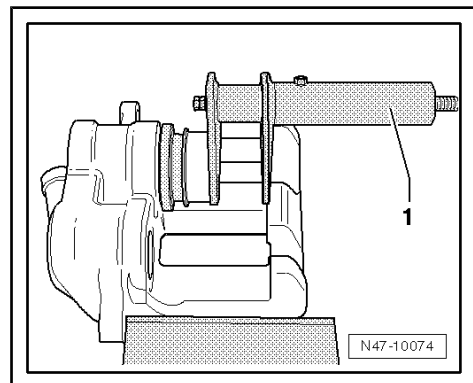
- Using removal wedge - 3409- , insert inner sealing lip into cylinder groove.

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



- Press piston into brake caliper housing using piston resetting tool - T10145- -1-.

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





## 2 Rear brake caliper

⇒ [“2.1 Assembly overview - rear brake caliper, Crafter 3.0 t and 3.5 t”, page 69](#)

⇒ [“2.2 Assembly overview - rear brake caliper, Crafter 5.0 t”, page 70](#)

⇒ [“2.3 Removing and installing rear brake caliper piston, Crafter 3.0 t and 3.5 t”, page 70](#)

⇒ [“2.4 Removing and installing rear brake caliper piston, Crafter 5.0 t”, page 72](#)

### 2.1 Assembly overview - rear brake caliper, Crafter 3.0 t and 3.5 t



#### Note

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

#### 1 - Protective cap

#### 2 - Bleeder valve

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

#### 3 - Brake caliper housing

#### 4 - Sealing ring

- Removing and installing ⇒ [page 70](#) .

#### 5 - Piston

- Removing and installing ⇒ [page 70](#) .

#### 6 - Dust boot for piston

- Removing and installing ⇒ [page 70](#) .

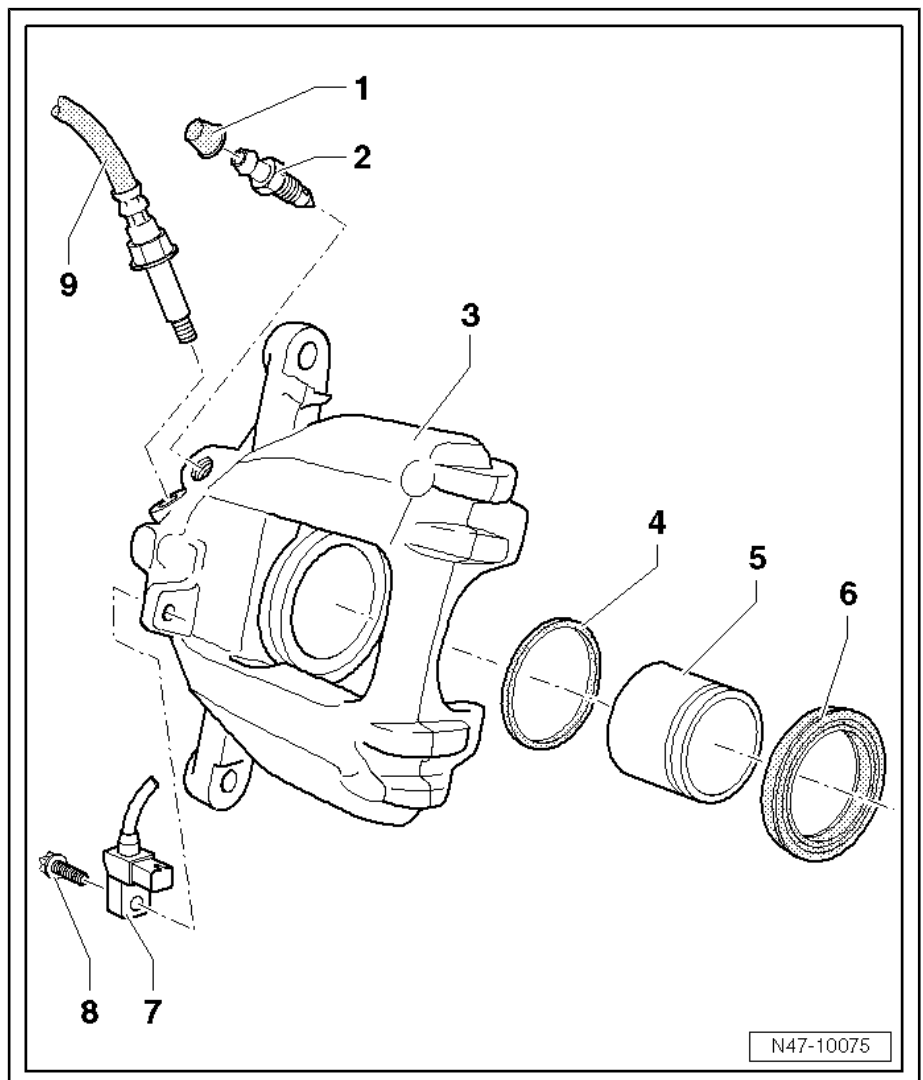
#### 7 - Connector for brake pad wear indicator

#### 8 - Bolt

- 8 Nm

#### 9 - Brake hose

- Secured to brake caliper.
- 35 Nm





## 2.2 Assembly overview - rear brake caliper, Crafter 5.0 t



### Note

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

#### 1 - Dust cap

#### 2 - Bleeder valve

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

#### 3 - Sealing ring

- Removing and installing ⇒ [page 72](#).

#### 4 - Protective cap

#### 5 - Piston

- Removing and installing ⇒ [page 72](#).

#### 6 - Brake caliper housing

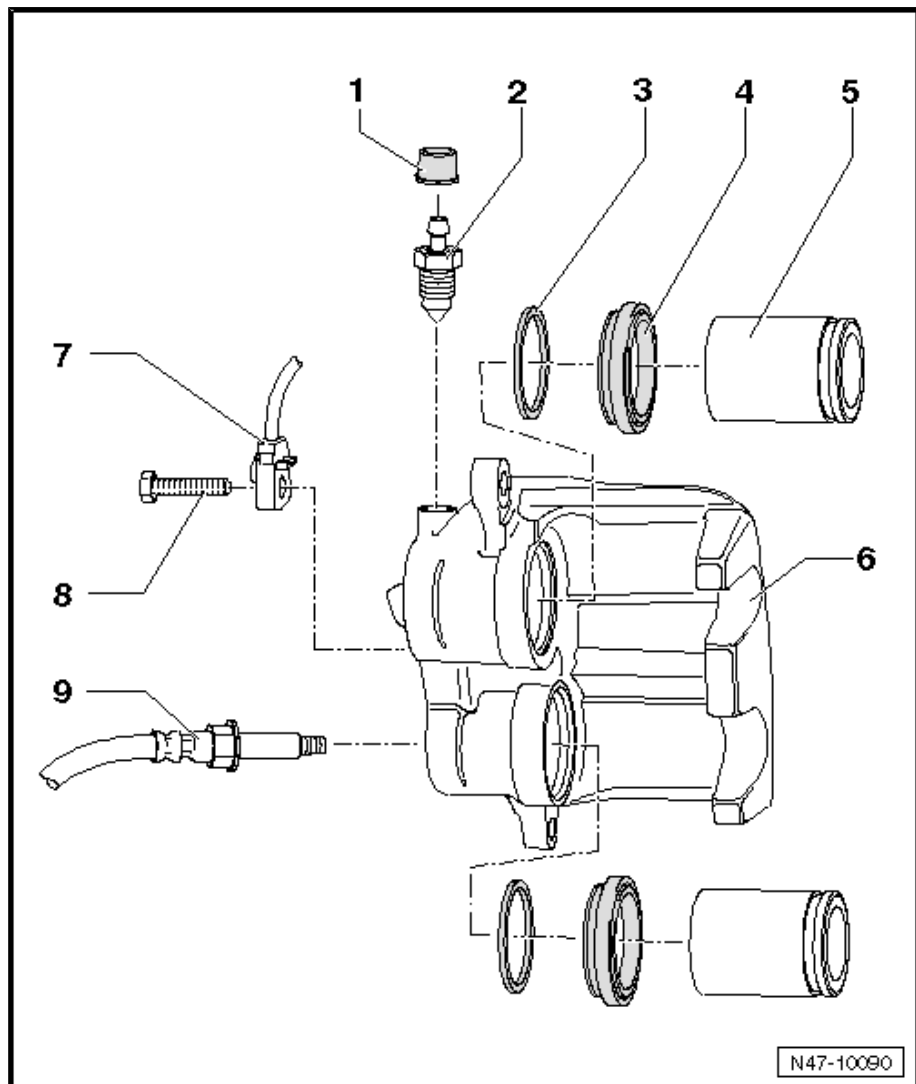
#### 7 - Connector for brake pad wear indicator

#### 8 - Bolt

- 8 Nm

#### 9 - Brake hose

- Secured to brake caliper.
- 35 Nm

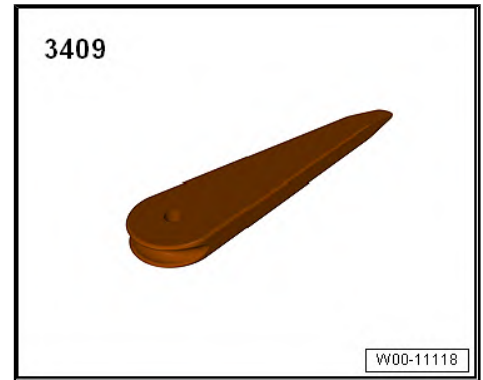


## 2.3 Removing and installing rear brake caliper piston, Crafter 3.0 t and 3.5 t

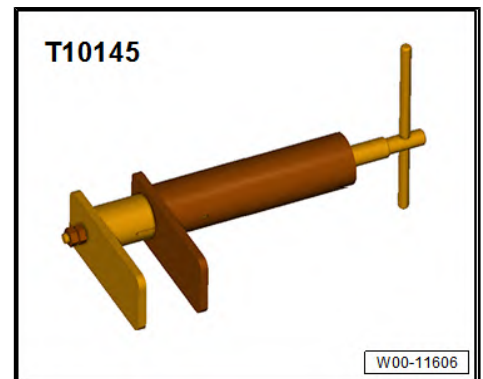
Special tools and workshop equipment required



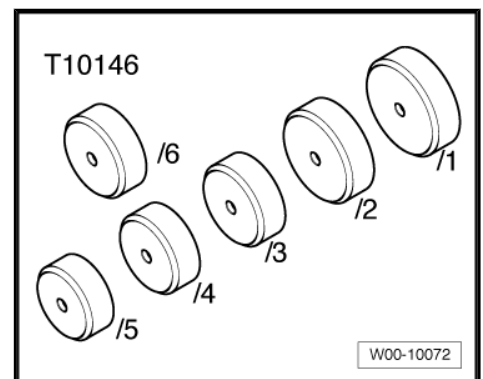
- ◆ Removal wedge - 3409-



- ◆ Piston resetting appliance - T10145-



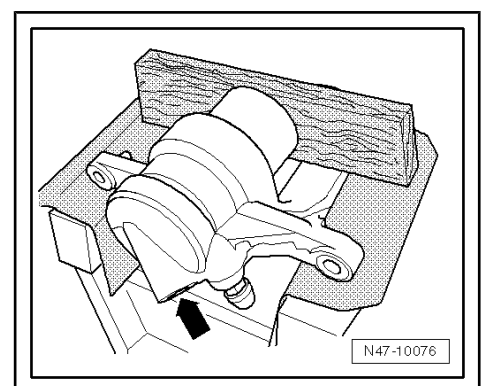
- ◆ Assembly tool for protective caps - T10146/3-



### Removing

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

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





- Remove seal using removal wedge - 3409- .

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

### Installing



#### Note

*Only use methylated spirits to clean brake caliper housing.*

- Apply thin coat of assembly paste - G 052 150 A2- to piston and seal before installing.
- Insert oil seal in brake caliper housing.
- Place protective cap with outer sealing lip on piston.

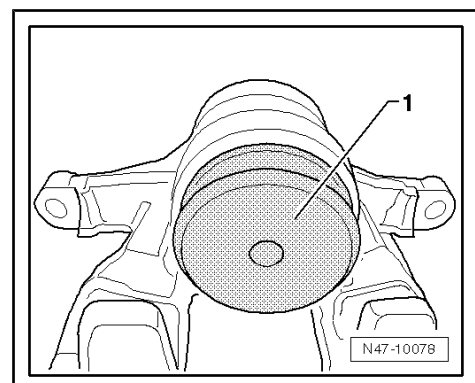
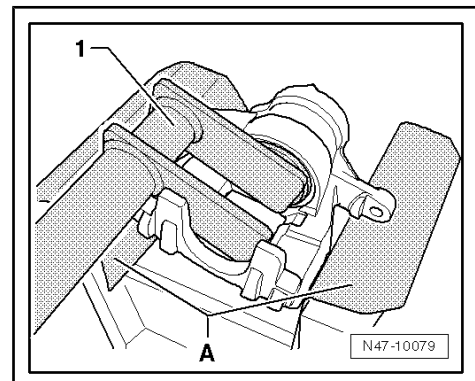
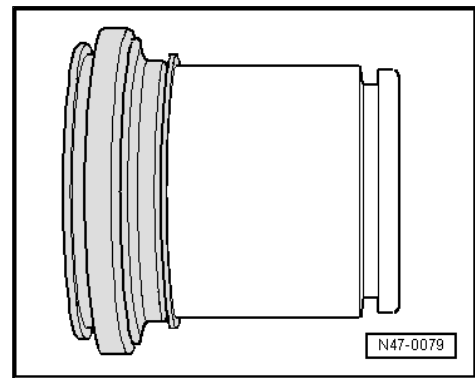
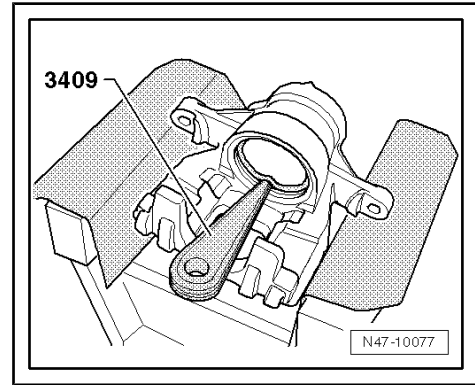
Hold piston in front of brake caliper housing.

- Press piston into brake caliper housing using piston resetting tool - T10145- -1-.

A - Vice clamp

- Using assembly tool for protective caps - T10146/3- -1- and piston resetting appliance - T10145- , press protective cap into brake caliper so that cap is fitted correctly all round.

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

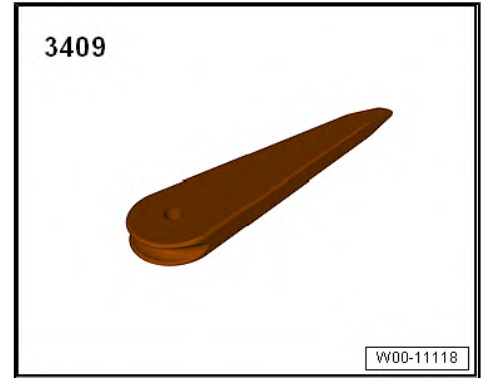


## 2.4 Removing and installing rear brake caliper piston, Crafter 5.0 t

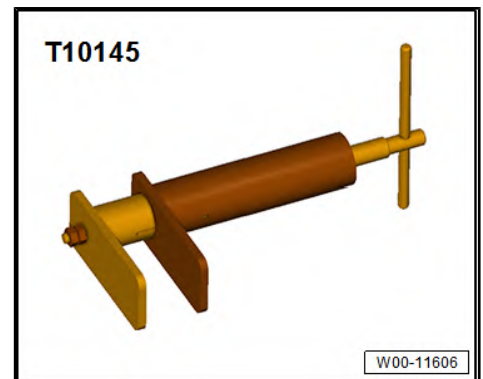
Special tools and workshop equipment required



◆ Removal wedge - 3409-



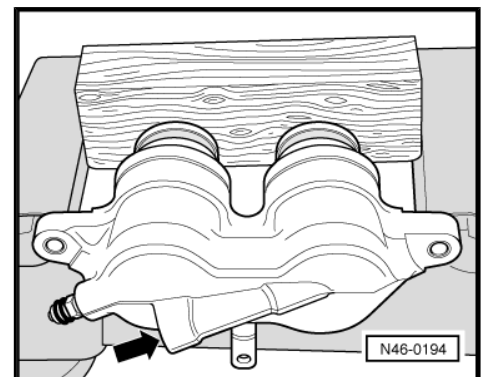
◆ Piston resetting appliance - T10145-



**Removing**

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

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



- Remove seal using removal wedge - 3409- .

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

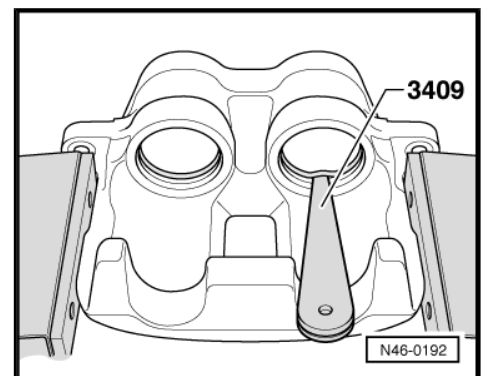
**Installing**



**Note**

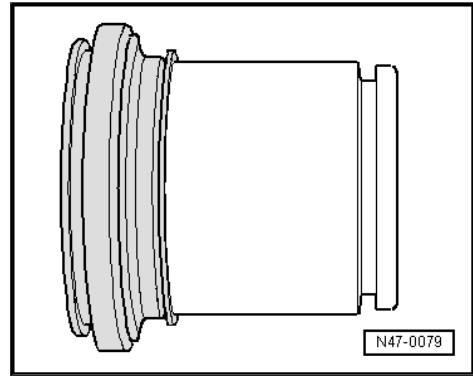
*Only use methylated spirits to clean brake caliper housing.*

- Apply thin coat of assembly paste - G 052 150 A2- to piston and seal before installing.
- Insert oil seal in brake caliper housing.



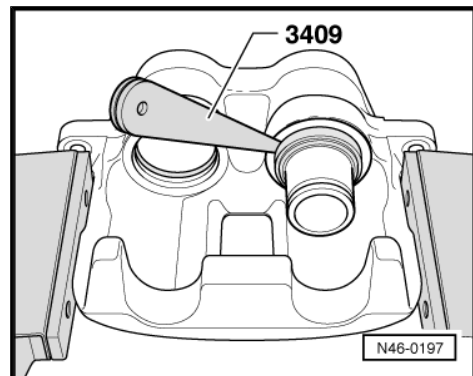


- Place protective cap with outer sealing lip on piston.



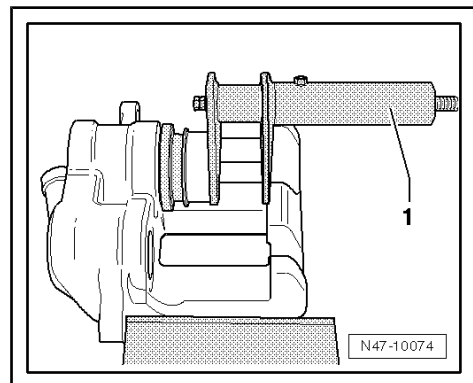
- Using removal wedge - 3409- , insert inner sealing lip into cylinder groove.

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



- Press piston into brake caliper housing using piston resetting tool - T10145- -1-.

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





### 3 Brake servo and brake master cylinder

⇒ [“3.1 Assembly overview - brake servo/brake master cylinder”, page 75](#)

⇒ [“3.3 Removing and installing brake servo”, page 77](#)

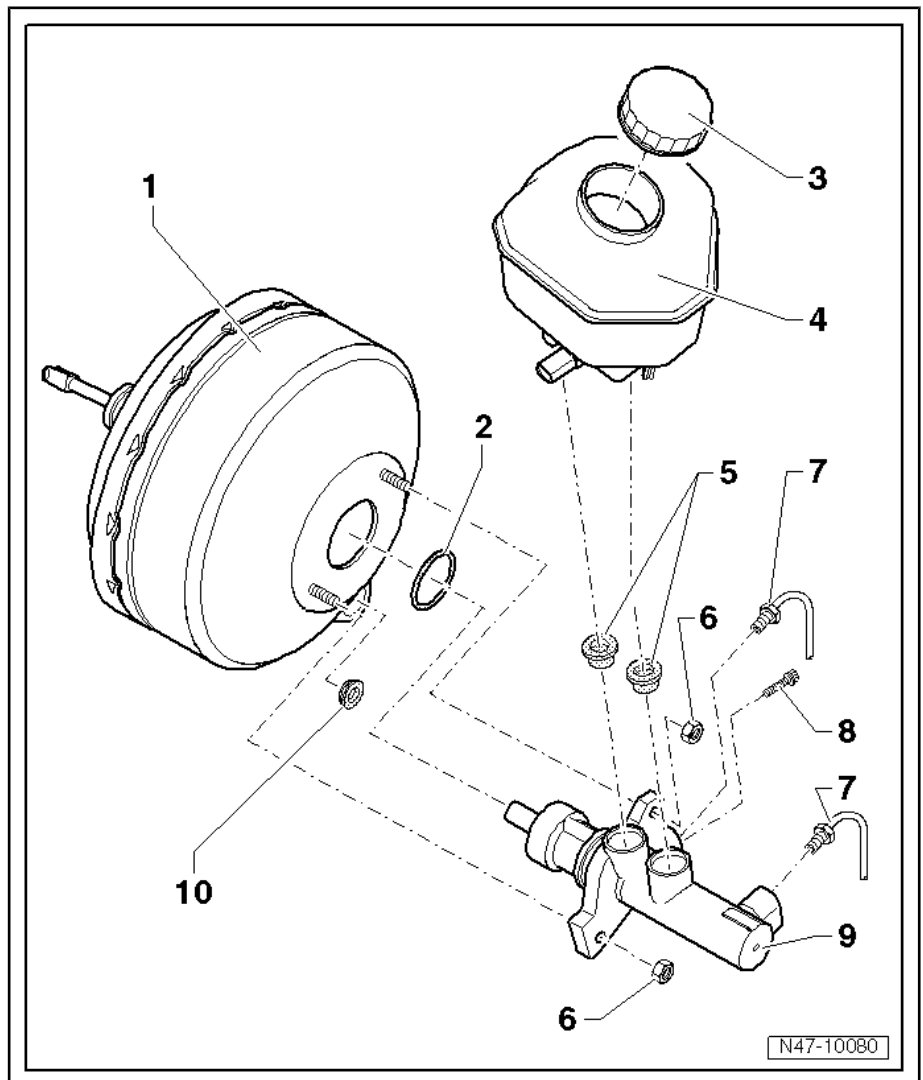
⇒ [“3.4 Removing and installing brake master cylinder”, page 78](#)

⇒ [“3.2 Removing and installing brake light switch F”, page 76](#)

#### 3.1 Assembly overview - brake servo/brake master cylinder

##### 1 - Brake servo

- Diesel engines are fitted with a vacuum pump to generate the necessary vacuum.
- A vacuum reservoir is additionally installed in certain vehicle types.
- Checking function
- With engine switched off, depress brake pedal firmly several times (to deplete vacuum in unit).
- Now step on and hold brake pedal with medium pressure and start engine. If the brake servo is functioning properly, the brake pedal will be felt to go down as the servo takes effect.
- If faulty, renew as a complete unit.
- Checking non-return valve (in vacuum hose) ⇒ [page 80](#).
- Separating from brake pedal ⇒ [page 64](#), Removing and installing brake pedal.
- Removing and installing brake servo ⇒ [page 77](#).



##### 2 - Sealing ring

##### 3 - Cap

##### 4 - Brake fluid reservoir

- With switch for brake fluid level

##### 5 - Sealing plug

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

##### 6 - Nut

- Renew after removing
- 20 Nm



## 7 - Brake line

## 8 - Bolt

## 9 - Brake master cylinder

- Removing and installing ⇒ [page 78](#) .
- Cannot be repaired, renew complete when faulty.

## 10 - Sealing plug

- Connection for vacuum hose.

## 3.2 Removing and installing brake light switch - F-

⇒ [“3.2.1 Removing and installing brake light switch F ▶ 05.2011”, page 76](#)

⇒ [“3.2.2 Removing and installing brake light switch F 06.2011 ▶”, page 76](#)

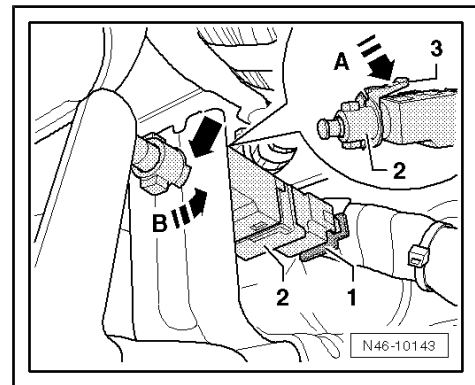
### 3.2.1 Removing and installing brake light switch - F- ▶ 05.2011

#### Removing

- Pull connector -1- off brake light switch - F- -2-.
- Press lever -3- in direction of -arrow A- and turn brake light switch - F- -2- to stop in direction of -arrow B-.
- Remove brake light switch - F- -2- from recess -arrow-.

#### Installing

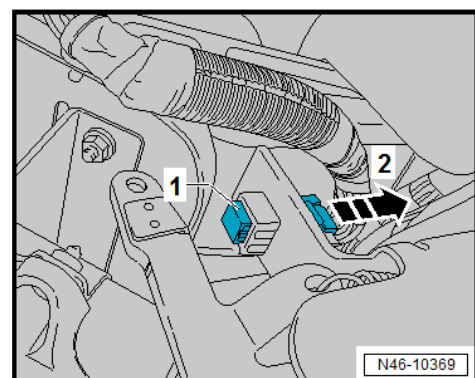
Install in reverse order.



### 3.2.2 Removing and installing brake light switch - F- 06.2011 ▶

#### Removing

- Pull brake light switch - F- -1- out of mounting in direction of arrow -2-.

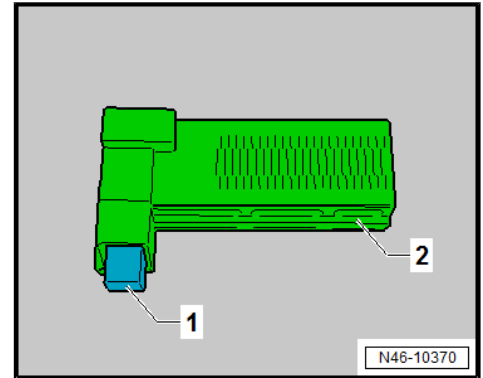




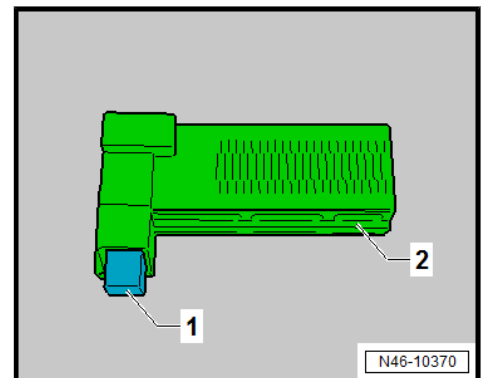
- Pull connector -1- off brake light switch - F- -2-.

**Installing**

- Brake pedal in rest position (not depressed).

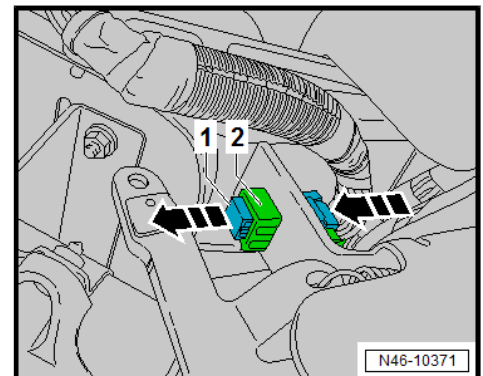


- Connect connector -1- to brake light switch - F- -2-.



- Insert brake light switch - F- -1- from behind and through detents of mounting -2- in -direction of arrow- until switch contacts brake pedal (in rest position). Other adjustments are not required.

In the figure the brake pedal is shown depressed for clarity



### 3.3 Removing and installing brake servo

**Removing**

- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Remove brake master cylinder ⇒ [page 78](#) .
- Remove driver footwell cover ⇒ General body repairs, interior; Rep. gr. 70 .

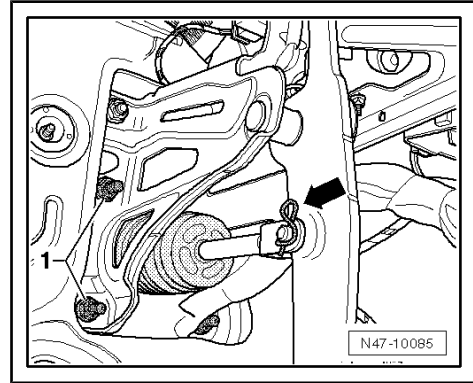


- Remove securing spring -arrow- on pin for connecting fork head to brake pedal.
- Remove pin for connecting fork head to brake pedal.
- Unscrew nuts -1- on both sides of mounting bracket.
- Remove brake servo.

#### Installing

Install in reverse order of removal, observing the following:

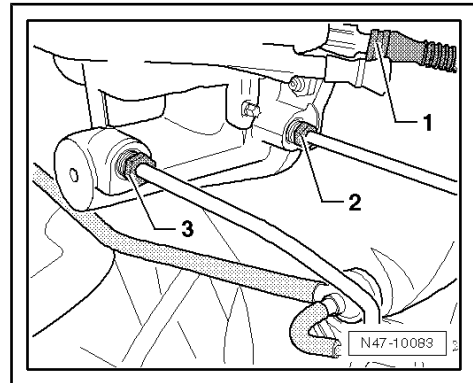
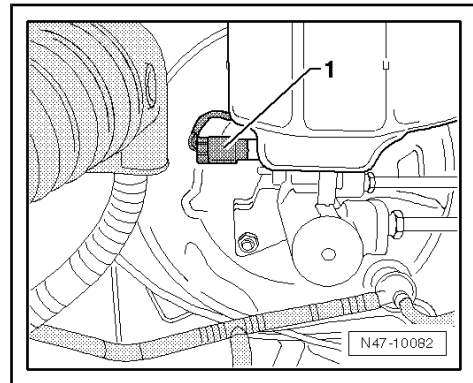
- Bleed brake system ⇒ [page 88](#) .



### 3.4 Removing and installing brake master cylinder

#### Removing

- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Pull connector -1- off brake fluid level sender.
- Place sufficient lint-free cloths in area of plenum chamber, engine and gearbox.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- or extraction unit - V.A.G 1869/4- .
- Pull off supply hose for clutch master cylinder -1-.
- Mark and unscrew brake lines -2- and -3- from brake master cylinder. Seal brake lines using sealing plugs from repair kit - 1H0 698 311 A- .





- Unscrew nuts -arrows- from brake master cylinder -1-.

**i** Note

*For ease of illustration, brake master cylinder is shown without brake fluid reservoir.*

- Carefully take brake master cylinder out of brake servo.

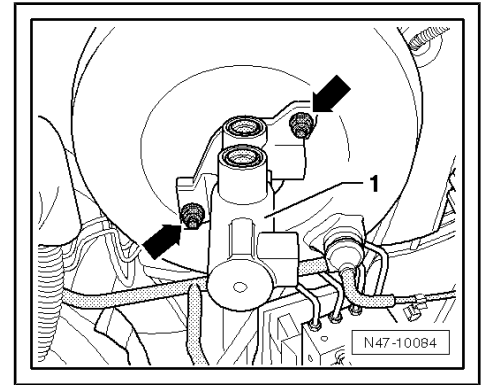
**Installing**

Install in reverse order of removal, observing the following:

- Bleed brake system ⇒ [page 88](#) .

**Specified torques**

- ◆ ⇒ [“3.1 Assembly overview - brake servo/brake master cylinder”, page 75](#)



## 4 Vacuum system

⇒ [“4.1 Assembly overview - vacuum pump for vehicles with 5-cylinder diesel engine”, page 80](#)

⇒ [“4.2 Checking non-return valve”, page 80](#)

⇒ [“4.3 Removing and installing vacuum pump”, page 81](#)

### 4.1 Assembly overview - vacuum pump for vehicles with 5-cylinder diesel engine

#### 1 - Vacuum pump

- ❑ Removing and installing  
⇒ [page 81](#).

#### 2 - Vacuum hose

- ❑ Before connecting, apply lubricant (e.g. tyre fitting lubricant) to connection on vacuum pump.

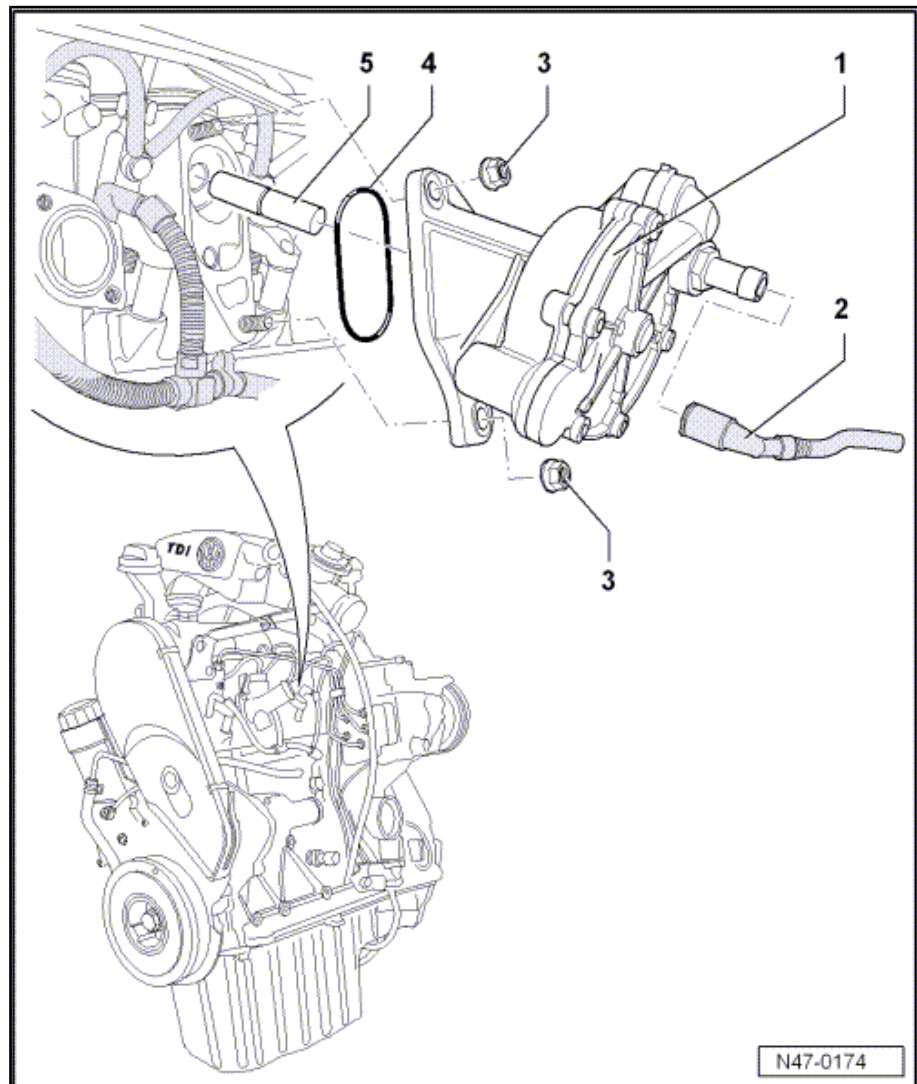
#### 3 - Nut

- ❑ 20 Nm

#### 4 - Sealing ring

- ❑ Renew after removing
- ❑ Check for correct seat when installing

#### 5 - Plunger



### 4.2 Checking non-return valve

The non-return valve is installed directly at brake servo vacuum connection.

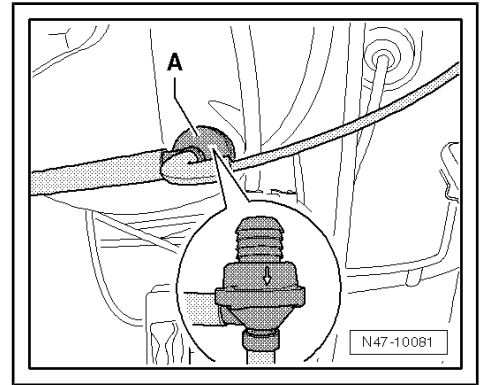


- Check non-return valve -A-.

The air must pass through the valve in the direction of -arrow-.

The valve must remain closed in the opposite direction.

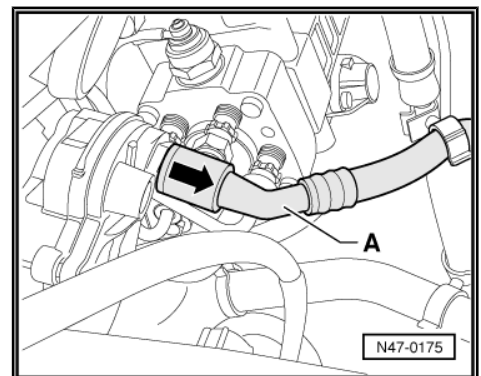
Observe correct installation position. Arrow must point in direction of vacuum pump or engine.



### 4.3 Removing and installing vacuum pump

#### Removing

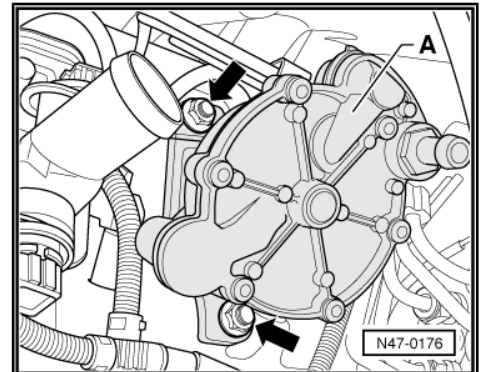
- Pull vacuum hose -A- off vacuum pump.



- Unscrew nuts -arrows- and remove vacuum pump -A-.

#### Installing

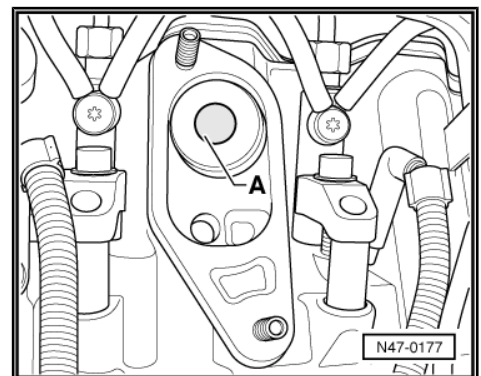
Install in reverse order of removal, observing the following:



- If necessary, continue turning engine until plunger -A- is flush with cylinder head.

#### Specified torques

- ◆ ⇒ ["4.1 Assembly overview - vacuum pump for vehicles with 5-cylinder diesel engine", page 80](#)





## 5 Brake lines

⇒ ["5.1 Assembly overview - flanging tool", page 82](#)

⇒ ["5.2 Notes for repairs to brake lines", page 83](#)

⇒ ["5.3 Repairing brake lines", page 84](#)

⇒ ["5.4 Additional brake line on Crafter 4MOTION with Achleitner four-wheel drive", page 86](#)

### 5.1 Assembly overview - flanging tool

#### 1 - Flanging tool upper part

- ❑ Unbolt to change flanging jaws .

#### 2 - Fastening for handle

- ❑ Must be unbolted to access securing bolt for upper part

#### 3 - Securing bolt

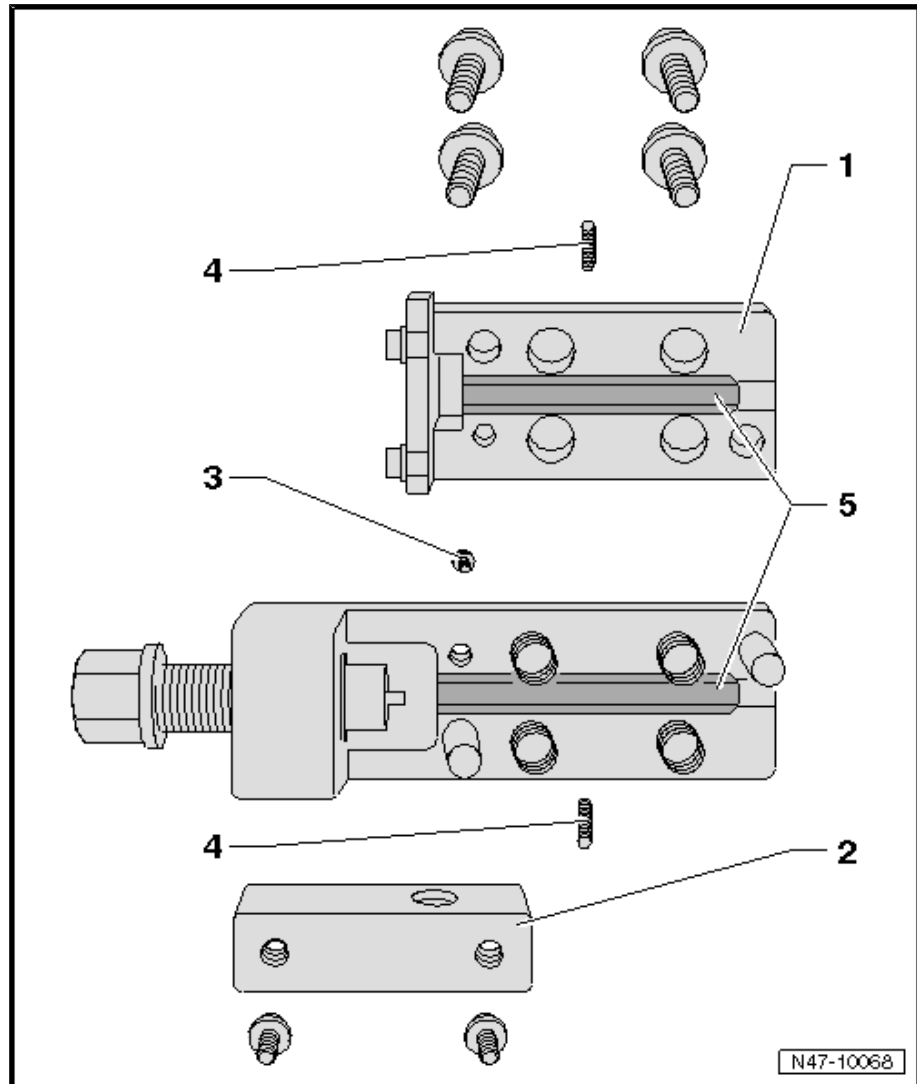
- ❑ For flanging tool upper part

#### 4 - Grub screws for flanging jaws

- ❑ Centring and holding flanging jaws .
- ❑ Hexagon socket head bolt, 2 mm

#### 5 - Flanging jaws

- ❑ Various
- ❑ Assembly instructions  
⇒ [page 83](#)



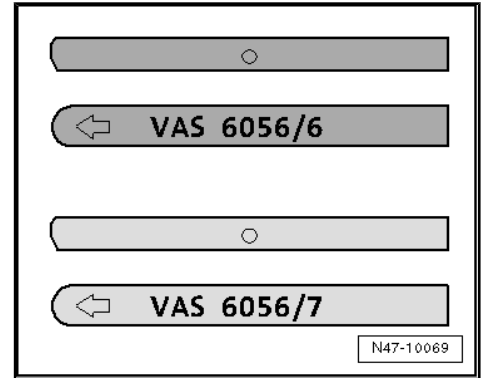


**Flanging jaw assembly instructions:**

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

**i Note**

*The arrow on the rounded side of the flanging jaws must point to the edge of the housing, and the straight side of the flanging jaws must be installed towards the spindle, or the flange will not be formed correctly.*



**5.2 Notes for repairs to brake lines**

The flanging tool for brake lines - VAS 6056- can be used to flange brake lines with an outer pipe diameter of 5 mm without damaging the coating. In certain cases, this allows sections of brake lines to be renewed at less expense.

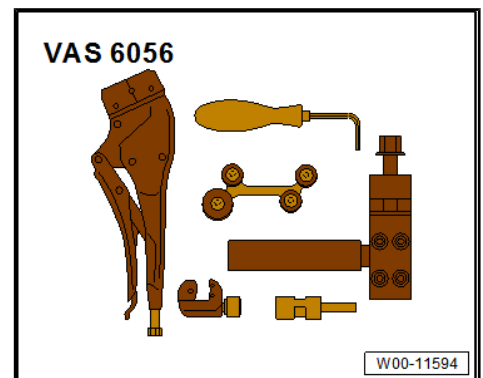
The use of flanging tool - V.A.G 1356- is not permitted due to the coating and the diameter of the black brake lines.

**i Note**

- ◆ *Brake lines may only be bent to max. 90°, as they otherwise kink or display deformations which constrict the cross-section of the line to an impermissible degree.*
- ◆ *Preferably separate brake lines at underbody.*
- ◆ *The positions of the intermediate pieces must be selected so that they cannot chafe on moving parts.*
- ◆ *Do not grease spindle; merely clean with methylated spirits.*

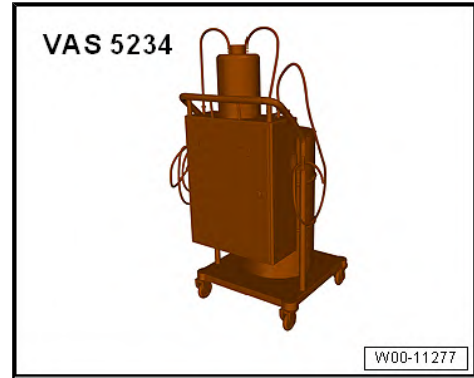
**Special tools and workshop equipment required**

- ◆ Flanging tool for brake lines - VAS 6056-





◆ Brake filling and bleeding equipment - VAS 5234-



List of individual tools:

1 - Flanging tool - VAS 6056/1-

- Flanging jaws - VAS 6056/6- are installed in flanging tool - VAS 6056/1- .

2 - Pipe cutter - VAS 6056/2-

3 - Brake line scraper - VAS 6056/3-

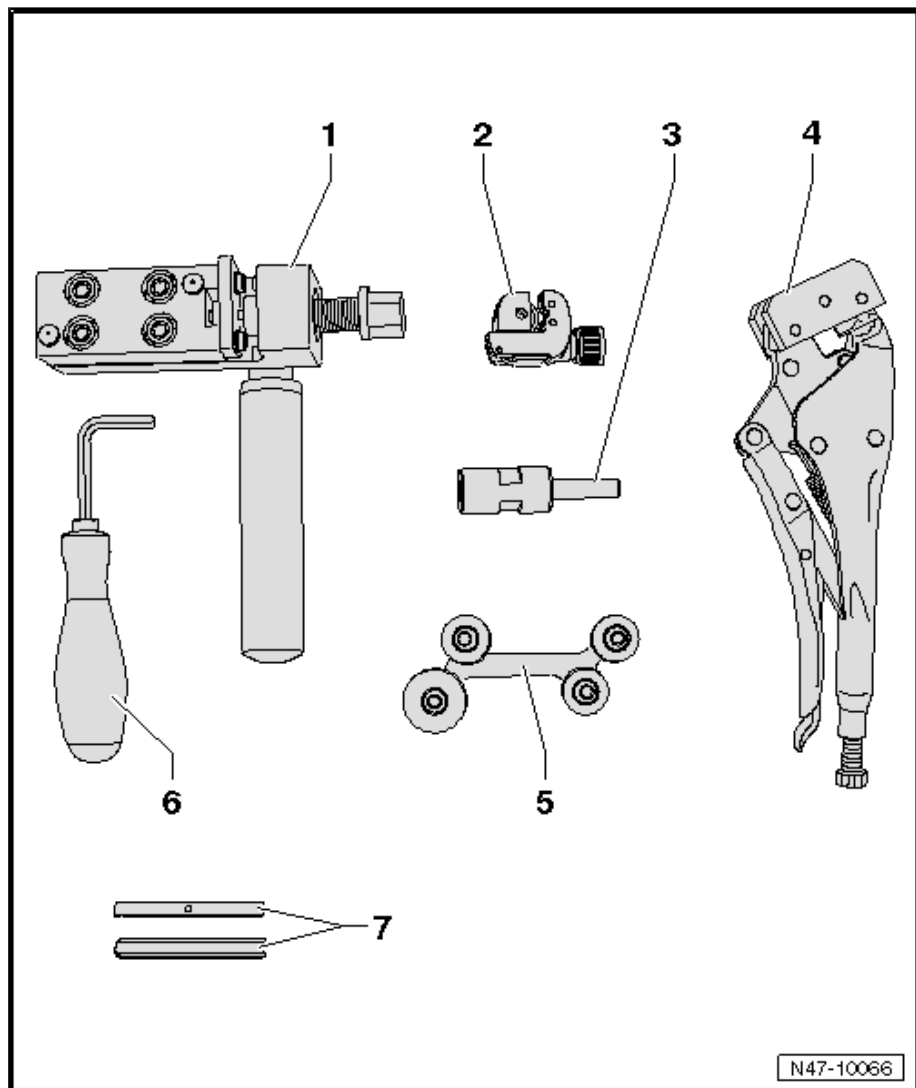
- Grub screws (in shaft and at side) are adjusted and must not be readjusted!

4 - Set of grips with plastic jaws - VAS 6056/4-

5 - Pipe bending tool - VAS 6056/5-

6 - Special wrench, 6 mm

7 - Flanging jaws - VAS 6056/7-

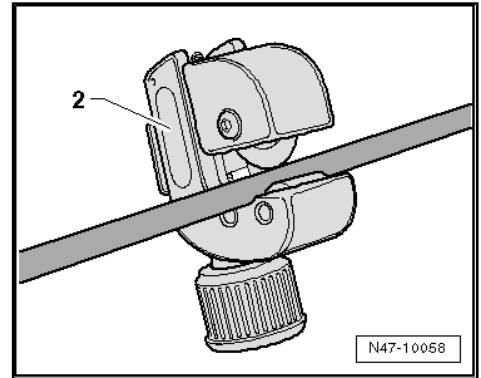


### 5.3 Repairing brake lines

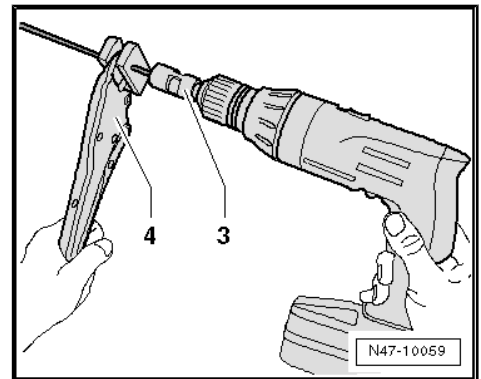
- Unbolt respective brake line from brake caliper or wheel brake cylinder. Catch escaping brake fluid and dispose of this as per regulations.



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



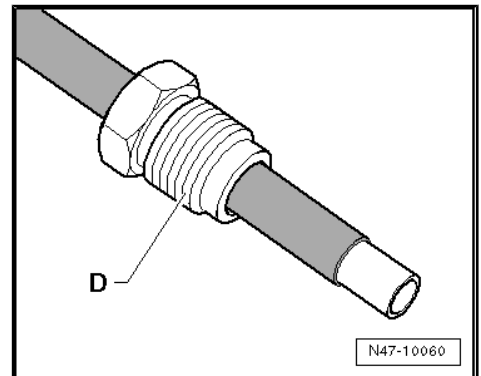
- Clamp brake line in a grip wrench -4- so that approx. 50 mm project from plastic jaws.
- Clamp scraper -3- into drill and position on brake line.
- At slow drill speed and with gentle pressure on brake line, scrape coating off brake line.



**i** Note

*Length of scraping is determined by stop in scraper.*

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

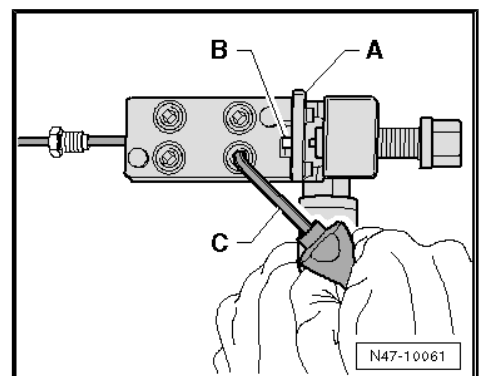


- Slide brake line -B- to stop -A- in flanging tool.

**i** Note

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

- Pre-tension brake line in flanging tool until brake line can no longer be moved. Then fold up stop -A- and use angled driver -C- to tighten hexagon socket head bolts in diagonal sequence.

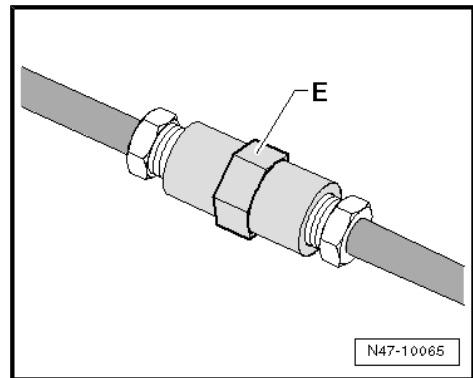
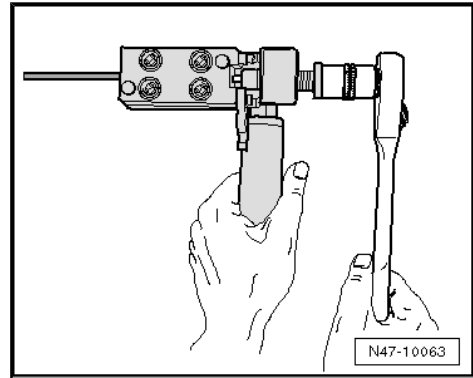




- Turn spindle to stop in flanging tool.
- Turn spindle back again.
- Release hexagon socket head bolts diagonally.
- Remove brake line from flanging tool. Clean and check brake line and flange.

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

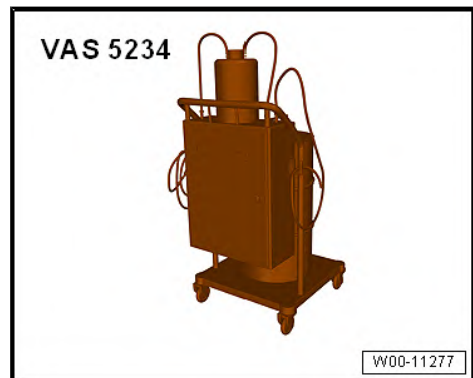
- Connect brake filling and bleeding equipment - VAS 5234- , connect bleeder bottle hose to brake line flange and allow brake filling and bleeding equipment - VAS 5234- to run briefly until a little brake fluid has run through.
- Blow out new brake line to be inserted with compressed air.
- Join brake lines using connector -E-.
- Install brake line.
- Bleed brake system ⇒ [page 88](#) .



## 5.4 Additional brake line on Crafter 4MOTION with Achleitner four-wheel drive

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-



### Note

- ◆ Crafter 4MOTION with Achleitner four-wheel drive is equipped with extended brake line to front brake calipers.
- ◆ When e.g. removing subframe of Crafter 4MOTION with Achleitner four-wheel drive, this extended brake line needs to be removed and reinstalled accordingly.



### Note

The connecting piece of the brake line can be found on the right side, behind the heat shield.

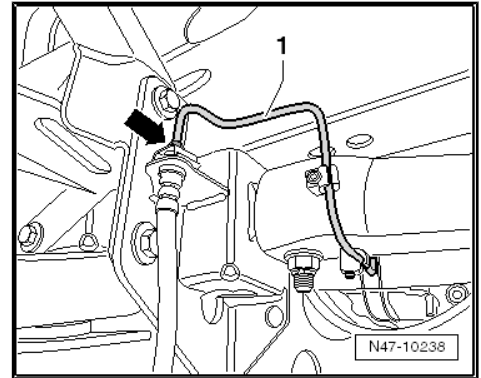


## Removing

### Note

Observe safety notes when handling brake fluid ⇒ [page 88](#) .

- Extract brake fluid using brake filling and bleeding equipment - VAS 5234- .
- Unbolt brake lines -1- from brake hose -arrow-, and seal brake lines using sealing plugs from repair kit - 1H0 698 311 A- .
- Disconnect brake line -1- from connecting piece -2-.
- Seal brake lines on connecting piece -2- using sealing plugs from repair kit - 1H0 698 311 A- .
- If necessary, unbolt heat shield on right side.



- Unclip brake line -1- by releasing clips -3- and remove it.

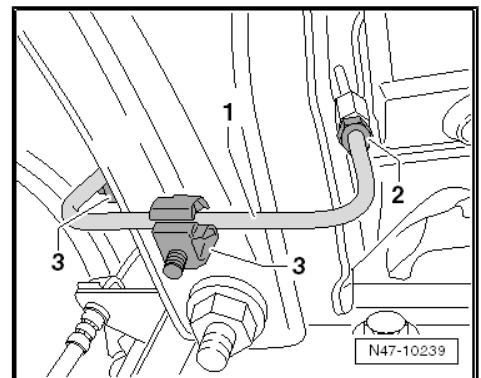
### Note

Brake pipes may only be bent up to max. 90°. They otherwise kink or reveal deformations which impermissibly constrict the pipe cross-section.

## Installing

Install in reverse order. Note the following points:

- Bleed brake system using brake filling and bleeding equipment - VAS 5234- ⇒ [page 88](#) .
- Carry out a road test.



### Note

Perform controlled brake test during road test (pulsations must be felt at brake pedal).



## 6 Hydraulic system

⇒ ["6.1 Bleeding hydraulic system following standard procedure", page 88](#)

⇒ ["6.2 Testing for leaks", page 89](#)

### 6.1 Bleeding hydraulic system following standard procedure



#### Note

*Bleeding the brake system is described for brake filling and bleeding equipment VAS 5234.*

- ◆ Bleeding brake system on vehicles with ABS is performed in the same way as on vehicles with a conventional brake system.
- ◆ While bleeding rear wheel brake, move lever of brake pressure regulator.
- ◆ Only use new brake fluid - B 000 700 A- (please specify the container index for the point).
- ◆ Brake fluid is poisonous. Also due to its corrosive effect brake fluid must not come into contact with paintwork.
- ◆ Brake fluid is hygroscopic, which means it absorbs moisture from the ambient air and should therefore always be stored in air-tight containers.
- ◆ Rinse off spilled brake fluid using plenty of water.

#### Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-



Bleeding brake system on vehicles with ABS is performed in same way as vehicles with a conventional brake system.

- Connect brake filling and bleeding equipment - VAS 5234- .
- Open bleeder valves in specified order and bleed brake calipers.

#### Bleeding sequence

- 1 - Rear right brake caliper
- 2 - Rear left brake caliper
- 3 - Front right brake caliper
- 4 - Front left brake caliper



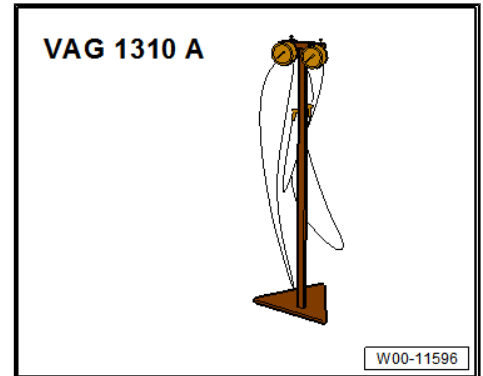
- Leave bleeder valve open with bleeder bottle hose connected until brake fluid free of air bubbles flows out.

Changing brake fluid ⇒ Maintenance ; Booklet 10.2 ; Work sequences; Changing brake fluid

## 6.2 Testing for leaks

Special tools and workshop equipment required

- ◆ Tester for brake pressure regulator - V.A.G 1310 A-



- ◆ Adapter M10 - V.A.G 1310/6-

**Test prerequisites:**

- Brake system (hydraulic unit, brake hoses, brake lines and brake calipers) operating properly and free of leaks.

**Checking**

- Remove bleeder valve at one of front brake calipers. Connect tester for brake pressure regulator - V.A.G 1310 A- and bleed.
- Apply pressure to brake pedal until gauge indicates a pressure of 50 bar. The pressure must not drop by more than 4 bar within the test period of 45 seconds. Renew brake master cylinder if drop in pressure exceeds specification.