

Document Title: Description brake system	Function Group: 500	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L20B [GB]			

Description brake system

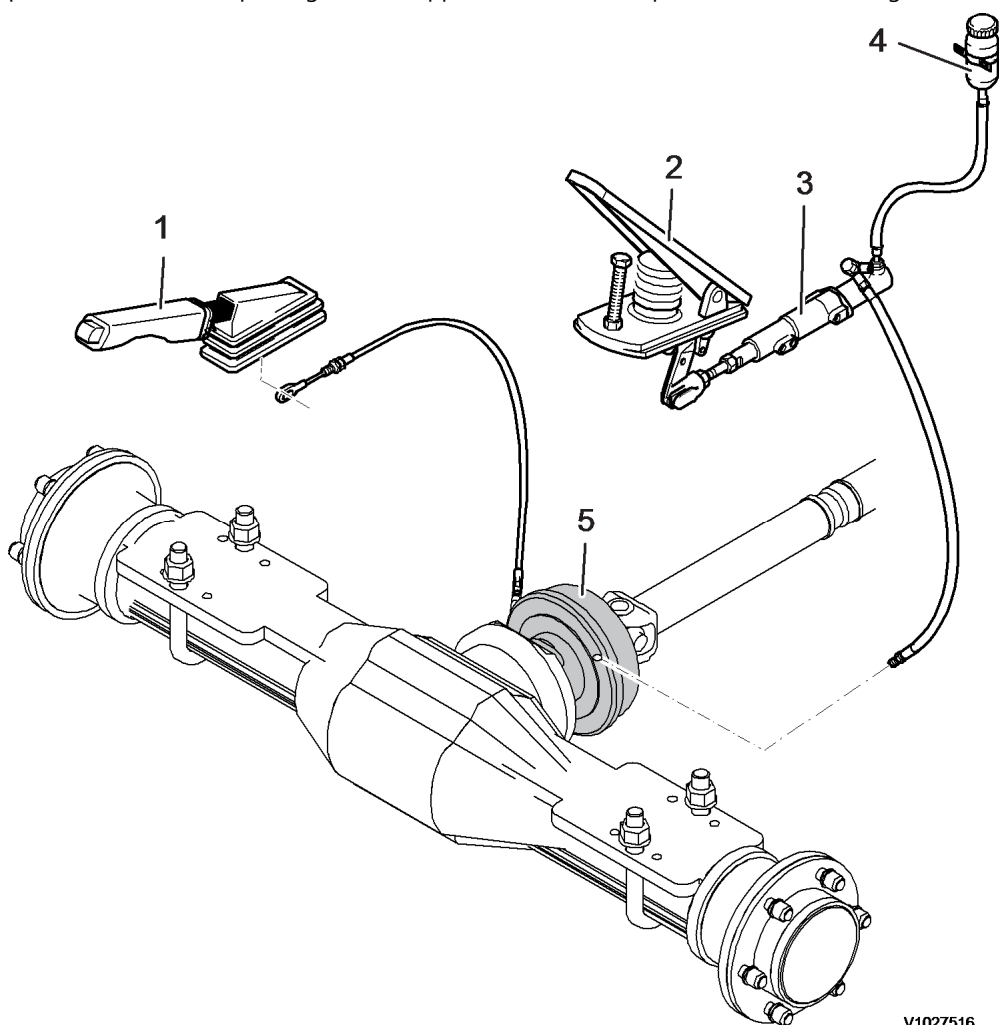
The service brake is a drum brake acting on the front axle and is operated via the inching brake pedal.

The braking effect is achieved by the drum brake via the front axle differential on the wheels of the front axle. At the same time, the braking effect is transmitted via the prop shaft to the gearbox / rear axle differential onto the wheels of the rear axle.

The parking brake acts by mechanical activation of the drum brake on the front axle.

The brake action therefore applies in the same way as for the service brake.

With the parking brake applied, the check lamp in the instrument panel lights. If a travel direction (forwards / reverse) is preselected while the parking brake is applied, the check lamp flashes and a warning buzzer sounds.



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Figure 1

1. Parking brake
2. Inch brake pedal
3. Brake cylinder
4. Expansion tank

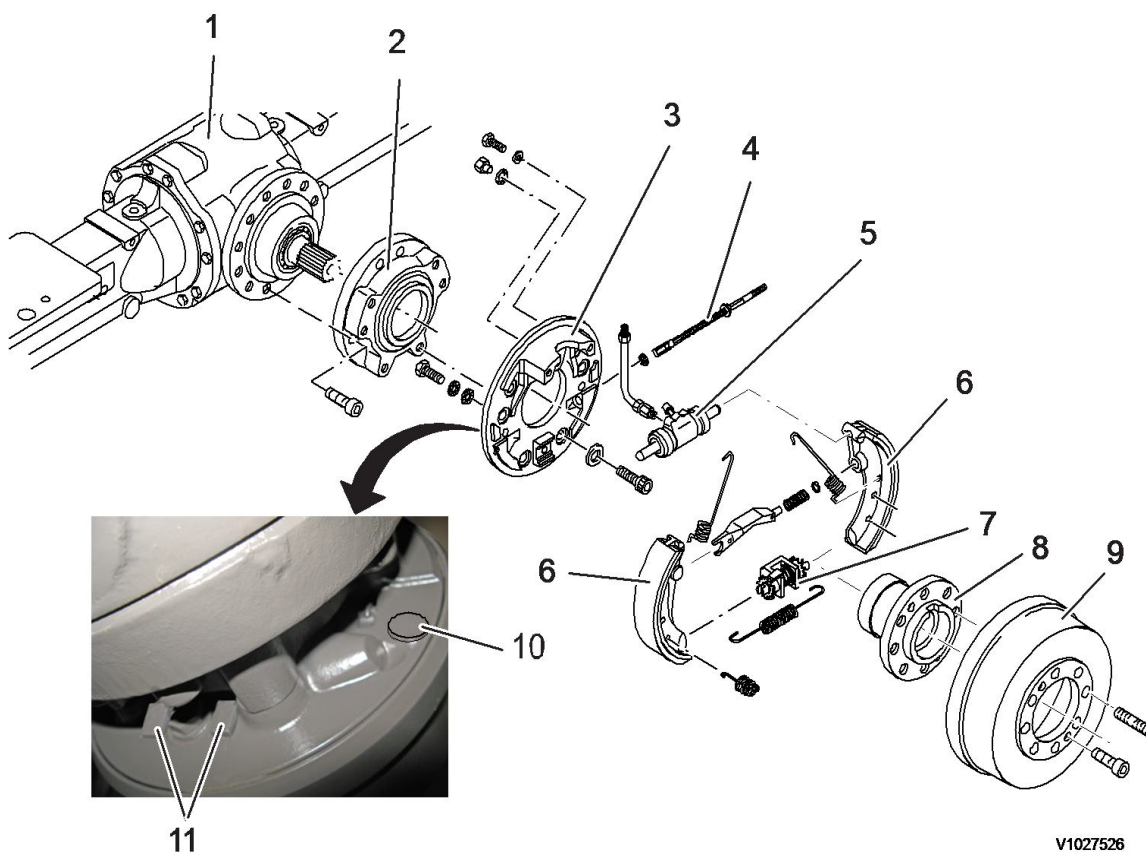
5. Drum brakes

Document Title: Brake design	Function Group: 500	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L20B [GB]			

Brake design

The brake pads must be replaced if worn unevenly and when the limit thickness is reached. To inspect the brake pads, remove the cover caps (10). For pad thickness, see [030 Brake specifications](#).

If severe scoring is evident on the run surface of the brake drum during inspection, the brake drum must be replaced.



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Figure 1

1. Front axle
2. Brake anchorage
3. Brake plate
4. Adapter, parking brake actuator cable
5. Cylinder
6. Brake lining
7. Adjusting device
8. Drive flange
9. Brake drum
10. Bore for brake pad wear check (both sides)
11. Closing cap for adjustment device

Document Title: Troubleshooting and actions to fix problems	Function Group: 500	Information Type: Service Information	Date: 2014/3/8 0
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Troubleshooting and actions to fix problems

General

The table below should help operators and maintenance staff determine the possible cause of a malfunction in the drive system before damage occurs. It does not claim to be complete, but serves merely to support troubleshooting and diagnostics. The column "Malfunction/error" contains faulty functions or malfunction symptoms which can occur in practice. The column "Possible malfunction cause" lists assemblies, operating media or states which may cause the malfunction.

The malfunction is located or eliminated by testing or changing the components specified in the column "Malfunction elimination".

Troubleshooting chart

Malfunction/error	Possible cause	Malfunction elimination
The bottom edge of the sleeve is ragged. The rubber part is crushed. The sleeve shows signs of breaking. The slip surfaces of the sleeves show signs of breaking. Grooves are visible on the slip surfaces of the machine.	The piston play in the brake cylinder is too great. The running surface is rough from corrosion, soiling or angled piston travel.	Replace the entire brake cylinder.
The protective caps feel hard; the surface is cracked or wrinkled; the inner and outer seat can be deformed plastically.	Insufficient shoe play. Seized brake pistons. Lack of piston rod play on brake cylinder.	Determine the cause and repair. Replace protective caps. Hot running usually damages other rubber parts. Replace these rubber parts, ideally the whole cylinder.
The protective caps are broken. The damage is visible on the caps.	Damage due to falling, impact or slipping installation tool.	Dirt which has penetrated is removed with methanol. Clean cylinder. Replace protective caps. If the running surface is scored, replace the entire cylinder.
Dirt has settled in the interior of the brake cylinder on the sleeves, in the piston bores, in the suction valve and on the rubber parts of the pressurization valve. In the low pressure area, the pedal can be pressed slowly. The prepressure is too low or falls away gradually.	Dirt due to various causes.	Use only clean mineral oil from original containers. The protective caps fitted for transport on the brake system connections must be removed before attaching the connection line. When fitting the follow-up line or expansion tank, ensure maximum cleanliness. Check that the protective caps are firmly secured.
When tightening the pipes, part of the screw flange on the cylinder has become detached.	Excessive tightening caused oversteering of the cast housing. The permitted tightening torque has been exceeded.	The connection parts should be tightened to max. torque 20 Nm (14.8 lbf ft) for thread M10x1 and 30 Nm (22.1 lbf ft) for M12x1. When tightening without a torque wrench, work with great care. Ensure the screw connections are positioned vertically. The screw connections must be able to be turned by hand.

Brake drum becomes hot.	Difficult actuation. Lever, linkage, brake cylinder sleeves swollen. Return springs broken. Incorrect setting of parking brake system. Incorrect setting of inch brake system.	Clean, free off, grease. Replace and adjust brake cylinders, see 520 Inching and brake, adjusting .
Poor or no braking effect of operating or parking brakes.	Difficult actuation. Lever, linkage, brake cylinder faulty.	Clean, free off, grease. Replace.
Noise when driving.	Torn actuation cable, difficult to move. Brake oil level incorrect or too low. Inching system not actuated. Linkage detached. Brake drum and linings oiled. Pads burned, brake drum glazed, pads broken. Brake drum overextended, pads worn.	Replace it. Replace brake fluid, bleed system. Attach linkage, check inching system, adjust inching system as specified. Seal leakage points, replace brake drum and pads, check/adjust inch brake setting, see 520 Inching and brake, adjusting .

Document Title: Brake pads, replacing	Function Group: 511	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L20B [GB]			

Brake pads, replacing

Op nbr 511-006

1. Bring machine to service position. Block wheels with chocks.
2. Turn OFF the battery disconnect switch.

Removing

3. Remove universal shaft (1) at brake drum.

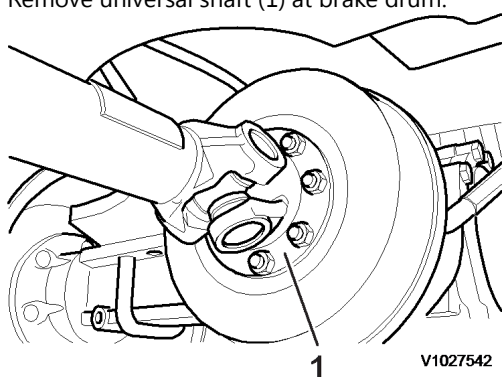


Figure 1

4. Unscrew cylinder bolts (1) and remove brake drum (2).

NOTE!

Turn adjuster back. To do this, remove the closing caps (arrow) on the back of the brake plate and turn adjuster back with a suitable tool.

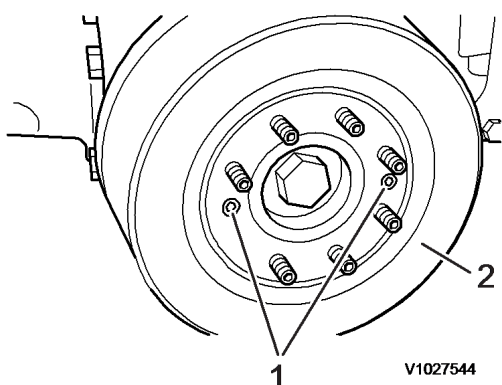
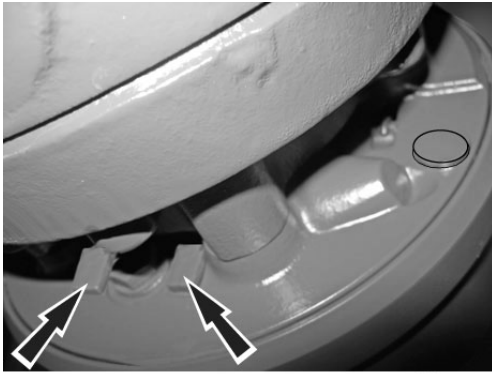


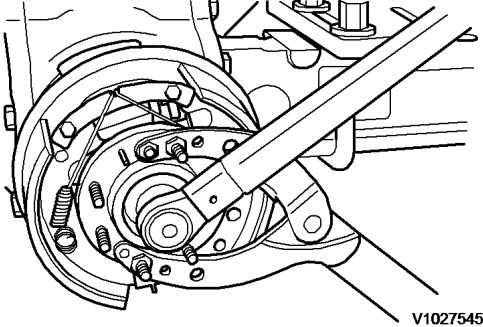
Figure 2



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Figure 3
Closing caps, adjustment device

5. Mount clamping fork. Unscrew bolt and remove drive flange.



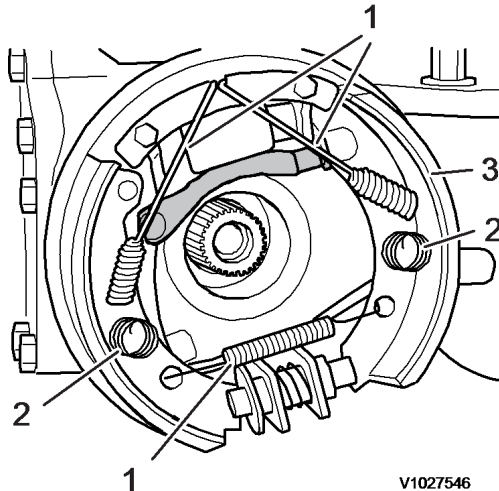
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Figure 4

NOTE!

Insert screw with Loctite, heat if necessary.

6. Detach draw springs (1) and thrust springs (2). Remove brake shoe (3).



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Figure 5

7. Remove thrust spring and washer on push rod.

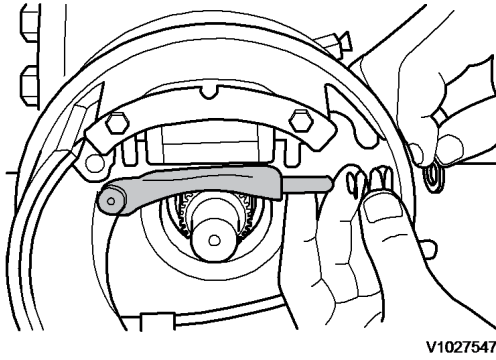


Figure 6

8. Detach handbrake cable (1) at brake shoe yoke.

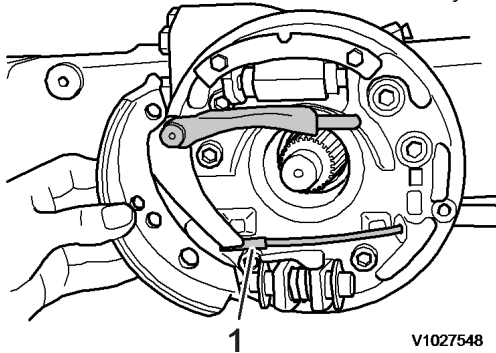


Figure 7

9. Clean cylinder and adjuster thoroughly. Check cylinder and connection parts for leaks. Lightly grease the adjustment device with heat-resistant grease.

Installation

10. Attach handbrake cable (1) at brake shoe yoke.

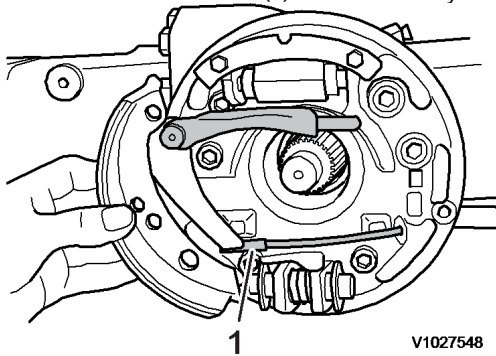


Figure 8

11. Position brake shoe and fix with thrust spring.

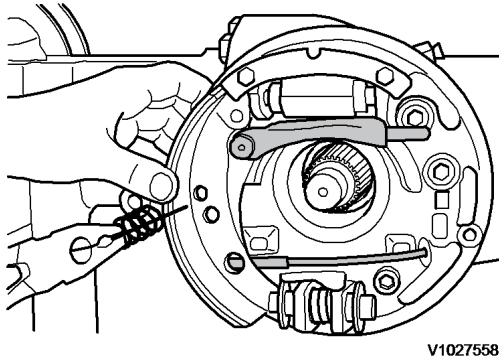


Figure 9

12. Push thrust spring and washer onto push rod.

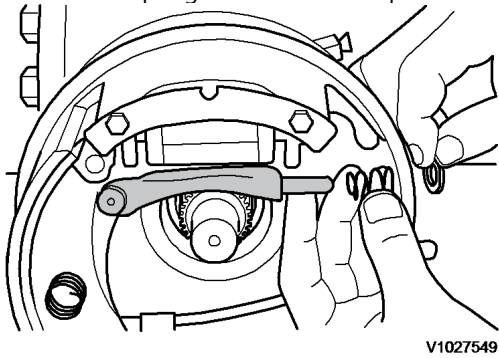


Figure 10

13. Position second braked shoe on push rod and fix with thrust spring.

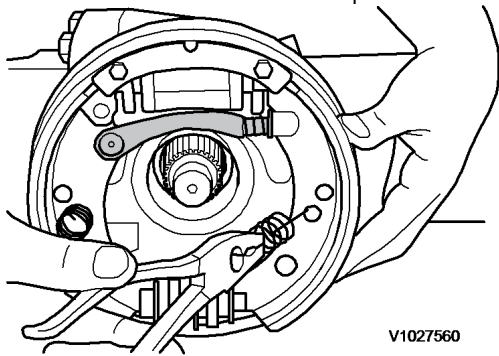


Figure 11

14. Attach draw springs (1).

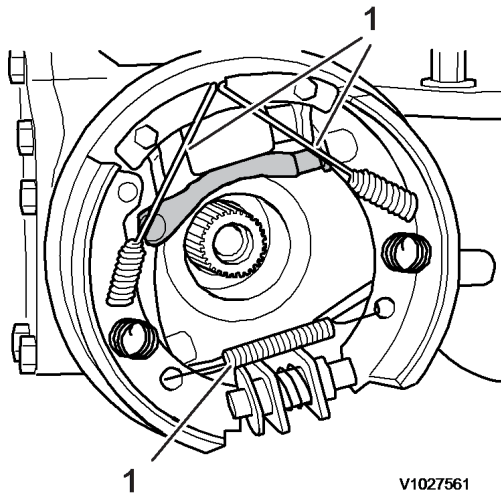


Figure 12

15. Push drive flange onto drive shaft. Mount clamping bracket. Screw in screw with Loctite no. 262, and tighten with torque **400 Nm (295 lbf ft)**.

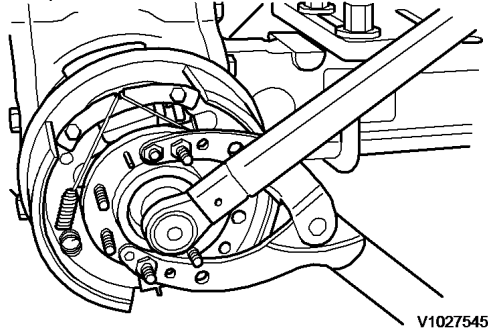


Figure 13

16. Position brake drum (2) and tighten with cylinder bolts (1). Tightening torque (**9,5 Nm (7 lbf ft)**).

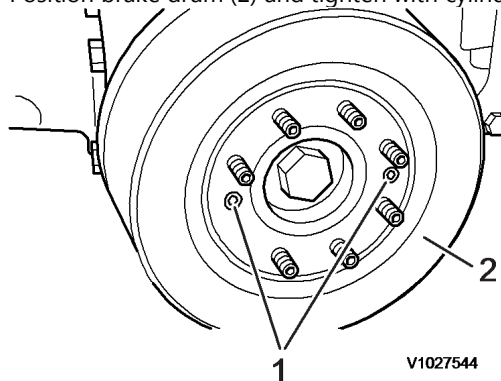
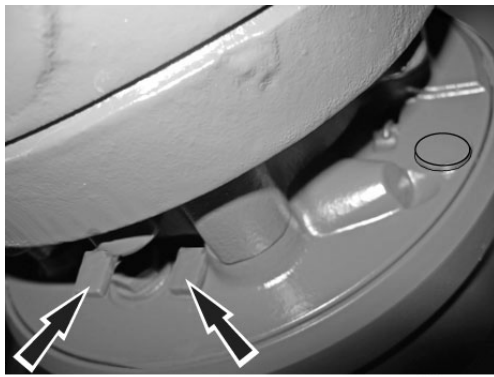


Figure 14

17. Remove closing caps (arrows) on back of brake plate. Tighten the adjustment gear with a suitable tool until the brake drum can be turned without audible grinding. Fit closing cap.



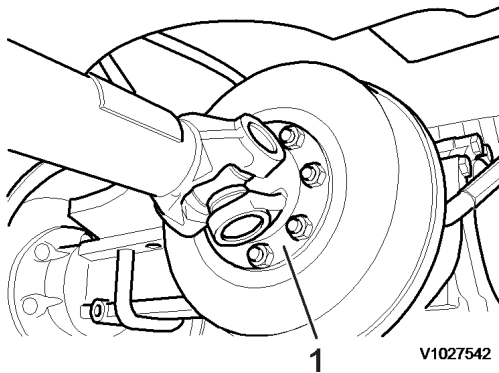
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Figure 15

18. Mount universal shaft (1) at brake drum. Tighten lock nuts. Tightening torque **72 Nm (53 lbf ft)**.

NOTE!

Use new lock nuts.



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Figure 16

19. Check brake fluid level and top up if necessary. For grade, see [160 Recommended lubricants](#).
20. Carry out test drive and check brake function.

Document Title: Brake cylinder, replacing	Function Group: 511	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L20B [GB]			

Brake cylinder, replacing

Op nbr 511-007

1. Bring machine to service position. Block wheels with chocks.
2. Turn OFF the battery disconnect switch.
3. Remove universal shaft (1) at brake drum.

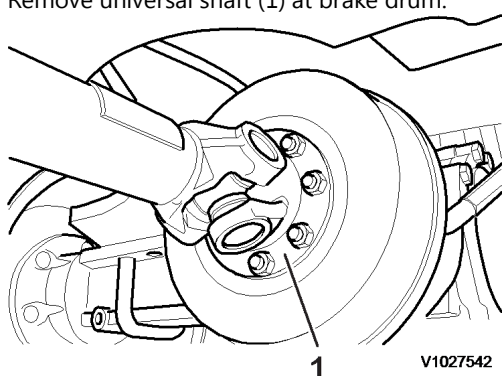


Figure 1

4. Remove brake drum and brake pads, see [511 Brake pads, replacing](#).
5. Remove spring holder (1).

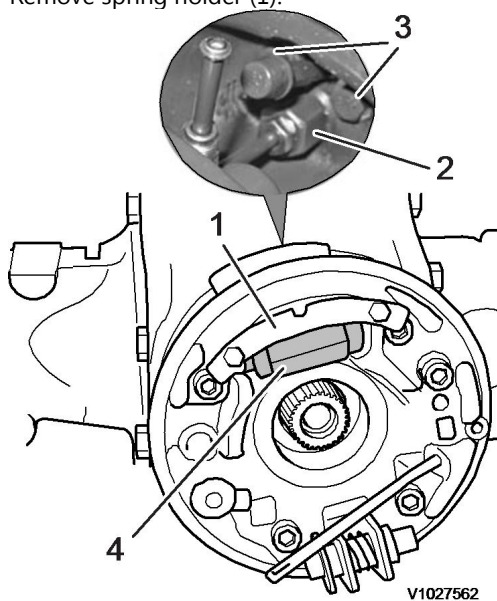


Figure 2

6. Remove brake line (2) from cylinder at the back of the brake plate.

NOTICE

Collect draining oil.

7. Unscrew bolts (3) and remove brake cylinder (4).
8. Clean the brake plate and adjustment device thoroughly. Grease the adjuster lightly with heat-resistant grease.
9. Insert new brake cylinder in bore and fasten with bolts (3). Tightening torque max. **25 Nm (18.4 lbf ft)**.
10. Mount brake line (2) on cylinder.
11. Mount spring holder (1).
12. Install brake pads and mount universal shaft, see [511 Brake pads, replacing](#).

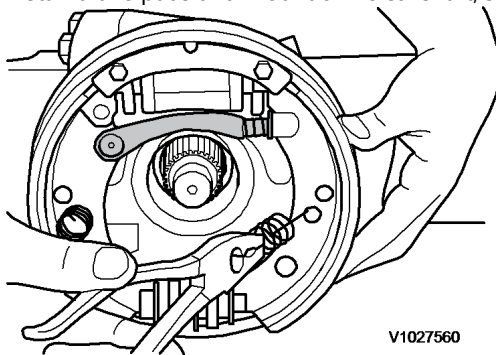


Figure 3

13. Bleed the brake system, see [520 Brake system, bleeding](#).
14. Check brake fluid level and top up if necessary. For grade, see [160 Recommended lubricants](#).
15. Carry out test drive and check brake function.

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