

BRAKES, WHEELS AND TYRES

The brake fitted to Borgward "Isabella" cars is of the Borgward - Teves hydraulic four wheel brake type, front wheels are fitted with "Duplex" two leading shoe brake, the rear wheel brake is of the "Simplex" type.

The adjustment of the front wheel brake shoes, which are operated by two separate wheel cylinders for each front brake, is effected by one eccentric adjuster for each brake shoe. When adjusting rear brakes it must be discriminated between a simple adjustment, which is effected on the eccentric adjuster and the basic adjustment of the brake, for which both lower eccentric adjusters must be actuated. The basic adjustment of the brake is fully described under B 5.

Make	Borgward - Teves		
Type	Hydraulic four wheel front Duplex rear Simplex		
Effective friction lining area	744 cm ² or 119,2 sq. in.		
Brake drum diameter	230 mm or appr. 9" dia.		
Width of lining	50 mm or 1.9685"		
Material	"Perlit" casting		
Master brake cylinder dia.	25.4 mm or 1"		
Wheel brake cylinder front dia.	36 mm or 1.42" stroke		
Wheel brake cylinder rear dia.	2 x 28.57 mm or 2 x 1 1/8"		
Handbrake, operating on	1 x 22.2 mm or 1 x 7/8" rearwheels, mechanically by handbrake lever		
Wheeldisk, type	Steel wheel disk		
Number	4		
Disk size, front & rear	4 J x 13		
Hole (bolt) circle	112 mm or 4.409"		
Number of holes	5		
Tyre size / Saloon	5.90 x 13"		
	<u>Road</u>	<u>Convertible</u>	<u>Autobahn/ Highway</u>
Tyre pressures, front	1.5 Atü or 20 lb/sq. in.	1.4 Atü or 18 lb/sq. in.	1.9 Atü or 28 lb/sq. in.
Tyre pressures, rear	1.7 Atü or 24 lb/sq. in.	1.5 Atü or 20 lb/sq. in.	2.0 Atü or 30 lb/sq. in.
Effective tyre radius, dynamically	289 mm or 11 3/8"		
Tyre size, Station Wagon	6.40 x 13"		
Tyre pressures, front	Road		Auto Highway
	1.5 Atü or 20 lb/sq. in.		1.9 Atü or 28 lb/sq. in.
Tyre pressures, rear	1.9 Atü or 28 lb/sq. in.		2.5 Atü or 40 lb/sq. in.

Adjust eccentric bolt so that shoe rests again drum.

Lift off shoe on top by adjustment of lower eccentric bolt.

Shoe adjustment is correct when wheel rotates freely.

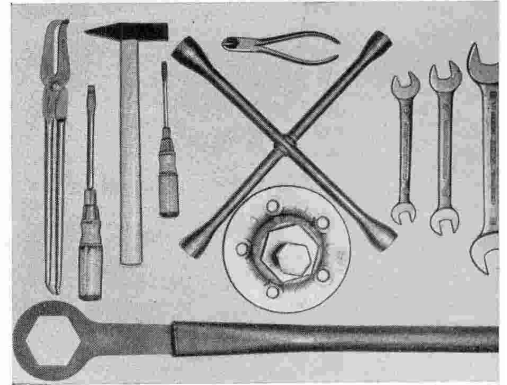
Eccentric bolt in centre position, secure with locking nut.

B. BRAKE

B 1. Brake removal and replacement
(including B 2, relining brake shoes)

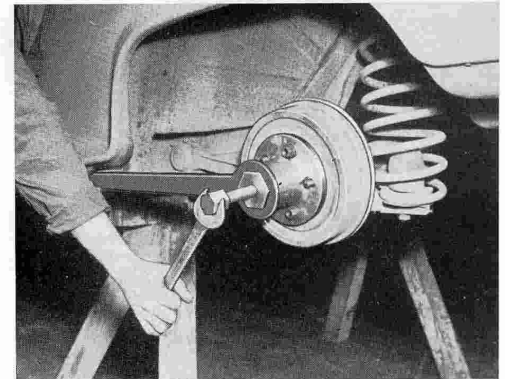
Tools: Wheelnut wrench, 2 large screwdrivers, spanner 14, 19, 27, 32 mm, hammer, punch, side cutting nippers, brake spring pliers, hub extractor WK 51, spanner for protection cap WK 102.

Figure 1



1. Remove hub cap, undo wheelnuts. (Screwdriver, wheelnut wrench)
2. Jack up car, take off wheels completely. (Wheelnut wrench)
3. a) Remove split pins for axle shaft nuts and undo nuts. (Side cutting nippers, spanner 27 mm)
- b) Undo protection cap of front wheel bearing, (Spanner for protection cap WK 102) remove the split pin from axle nut (Side cutting nippers) and unscrew the nut (Spanner 27 mm), pull off locking washer.
4. Extract brake drums with hubs. (Hub extractor WK 51)

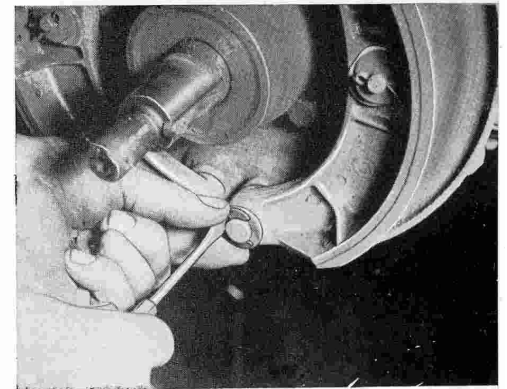
Figure 2



Caution: Do not separate hubs from brake drums resp. reassemble in same position only, for hub and drum are balanced together.

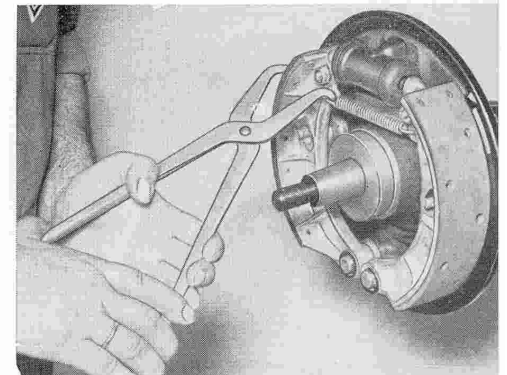
5. Remove horse shoe washers on brake anchoring bolt, remove shims. (Screwdriver)

Figure 3

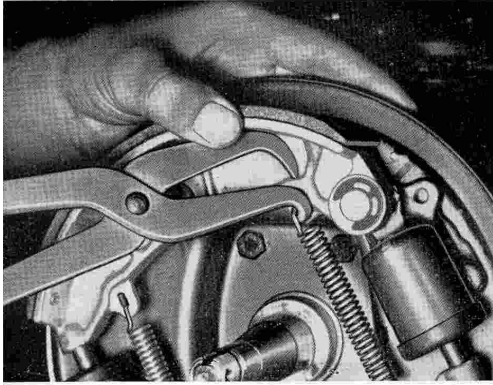


6. Remove split pins from eccentric bolt, remove washer and spring washer.
7. Take off springs - (Brake spring pliers)

Figure 4



Caution: Remove split pin and undo top nut on rear wheel brake shoe with hand brake lever. It is not essential to undo the remaining nuts on brake shoes. (Side cutting nippers, spanner 14 mm)

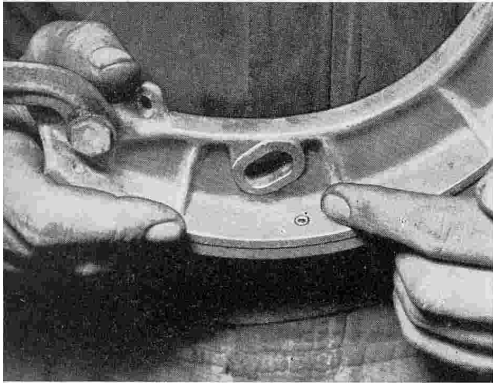


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8. Turn all eccentric bolts outwards, i. e. on highest position.
(Spanner 19 mm)
9. Remove brake shoes uniformly.
(2 screwdrivers)

Caution: It is not essential to remove brake cylinder. The frontwheel brake is equipped with 2 brake cylinders, therefore both brake pull off springs must be taken off.

Figure 5



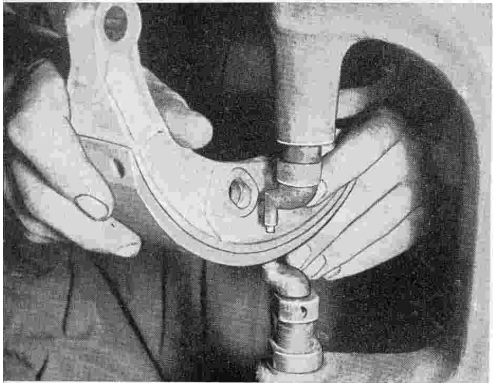
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Relining the brake shoes

1. Unrivet old brake lining.
2. Fit new lining and rivet diagonally, starting from the centre. Therefore the rivet in centre is the first to be riveted.

Figure 6

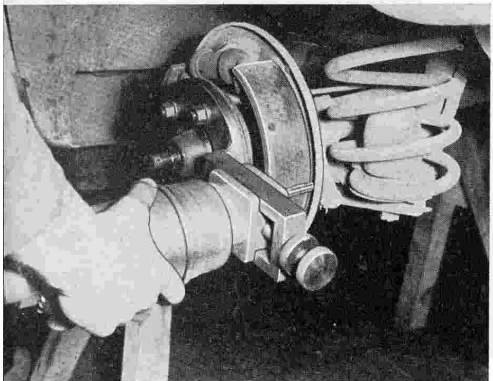
Caution: Do not allow grease, paint, oil or brake fluid to come in contact with the new brake lining. Do not touch with oily or greasy fingers.



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3. Rivet brake lining with all rivets, use only correct hollow brass rivets.

Figure 7



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4. It is expedient to regrind brake shoes after reassembly with a brake shoe grinding apparatus to ensure a uniform bearing surface and to remove traces of grease if any.

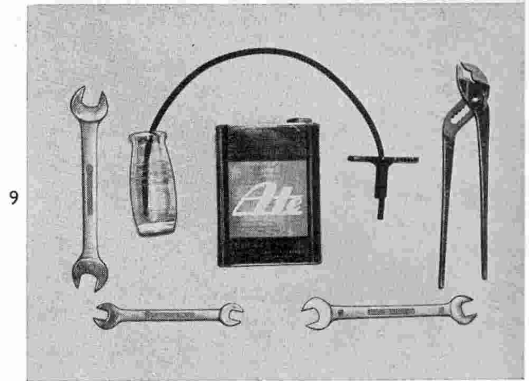
Figure 8

Brake reassembly in reversed sequence. Brake system must be bled after reassembly and basically adjusted. (See B 5)

B 5. Adjustment of brake and hand brake
Bleeding of brake system

Tools: "ATE" brake fluid, glass, bleeder, tube with socket spanner, spanner 14, 19 mm, gland nut pliers.

Figure 9

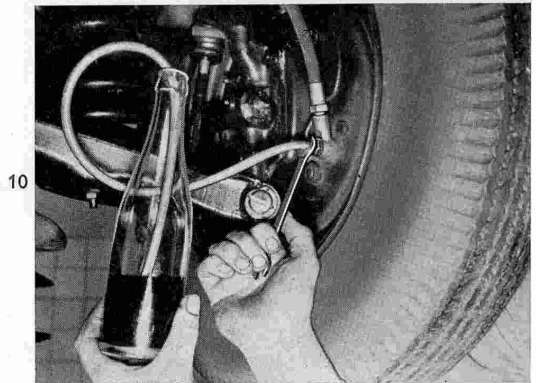


Caution: Brake must be adjusted with warmed up brake drums, i. e. after a prolonged drive with sufficient application of the brake. This is of great importance and must by no means be neglected!

1. Jack up car, front and rear, to allow wheels to rotate freely.
2. Both brake cylinders of the front brake must be bled, first top, then bottom.

Caution: Attention must be paid to the fluid level in the master cylinder when bleeding, replenish if necessary. Depress the brake pedal quickly and allow it to return slowly without assistance.

Figure 10



When tightening bleeder valve the brake pedal must remain depressed.

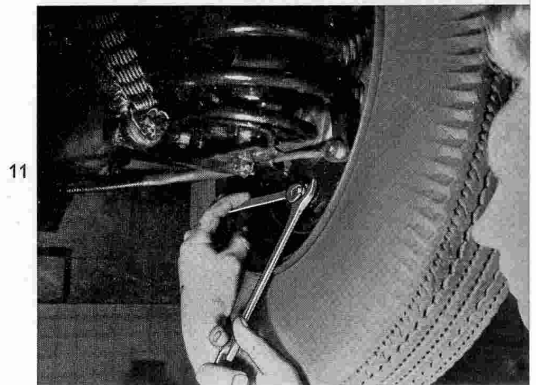
Caution: A discrimination must be made between basic adjustment and simple readjustment. The working process for both kinds of front brake adjustment is the same and as follows:

3. Undo lock nut of eccentric bolt for adjustment. (Spanner 19 mm)
4. Rotate eccentric bolts so far outwards till the brake shoe begins to bind, turn back again until the brake shoe is just free again.

a) Basic adjustment of rear brake

5. Undo lower eccentric bolt. (Spanner 14, 19 mm)
6. Undo upper eccentric bolt in the same manner and turn outwards till the wheel binds.
7. Adjust lower eccentric bolt until the wheel is free to rotate.

Figure 11



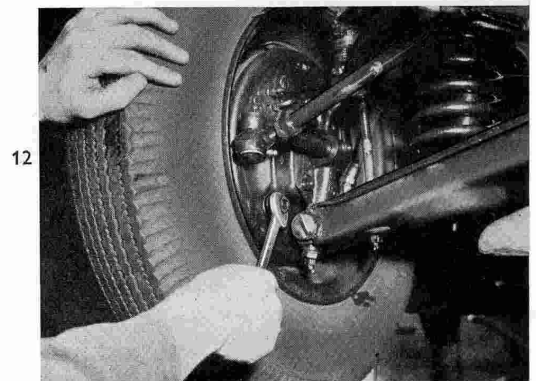
8. Repeat this method with the upper and lower eccentric bolt as long as further readjustment of the lower eccentric bolt will no longer free the wheel.
9. Adjust lower eccentric bolt by turning to the left or right to the most favourable position so that the wheel can be rotated dragingly. Fix eccentric bolt in this position by lock nut.
10. Lift off shoe from brake drum diameter with upper eccentric bolt.

Caution: This adjustment must be carried out on all four brake shoes of the rear wheels.

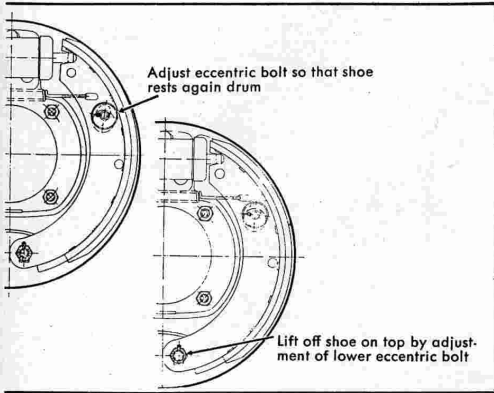
Figure 12

b) Ordinary brake adjustment

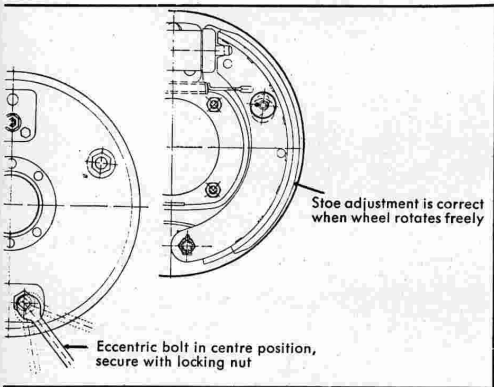
5. Undo upper adjustment eccentric bolt, i. e. eccentric bolt directly next to the brake cylinder. (Spanner 19 mm)
6. Adjust upper eccentric bolt by rotation outwards till the brake binds, then again inwards until the brake just runs free.
7. Secure eccentric bolt in this position by lock nut.



Isabella



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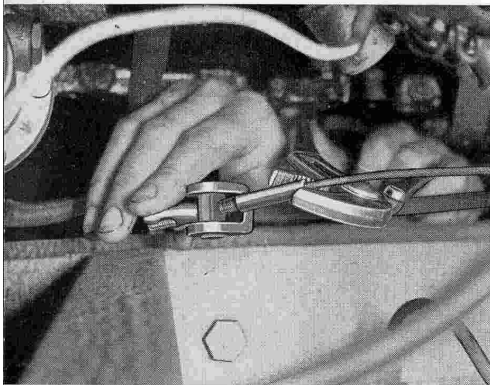
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Caution: Both drawings L 13 and L 14 show again the possibilities of adjustment.

8. Readjustment of the handbrake is possible in two places.

a) Adjuster bolt for both brakes, hold brake cable with gland nut pliers.

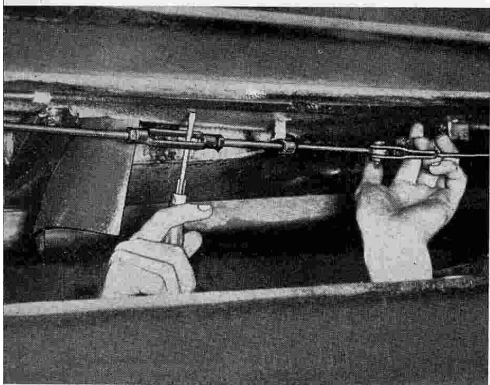
Figure 15



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b) Readjustment on turnbuckle underneath the vehicle.

Figure 16



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Caution: The hand brake is correctly adjusted when a tangible brake effect is present on the toothed rack when pulling the handbrake cable up to 1/3 travel length.