Tips & Technology
For Bosch business partners

Current topics for successful workshops No. 07/2014

Brake Technology

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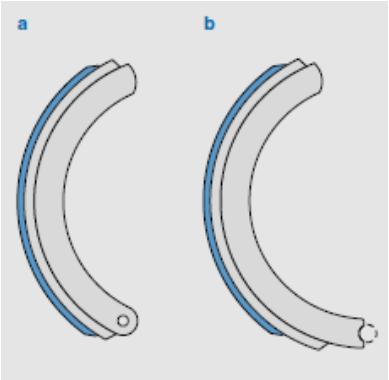
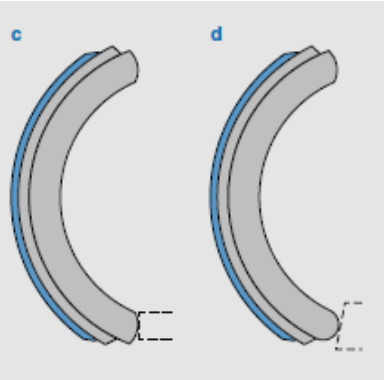
Drum Brakes

Drum brake business is frequently underestimated by automotive workshops. After all, drum brakes are featured on the rear axle of more than 40 % of registered passenger cars. One important reason for this besides their exceptional reliability is their great flexibility: drum brakes combine well with driver-assist systems such as ABS or ESP®. This is why they will continue to be found in a significant portion of the new-car market in the lower- and mid-priced segments – and thus assure new jobs in your workshop.

Designs

Drum brake designs are divided into two types on the basis of how the brake shoes are guided:
- Brake shoes with a fixed pivot point
- Brake shoes as floating shoes, parallel-guided and obliquely guided



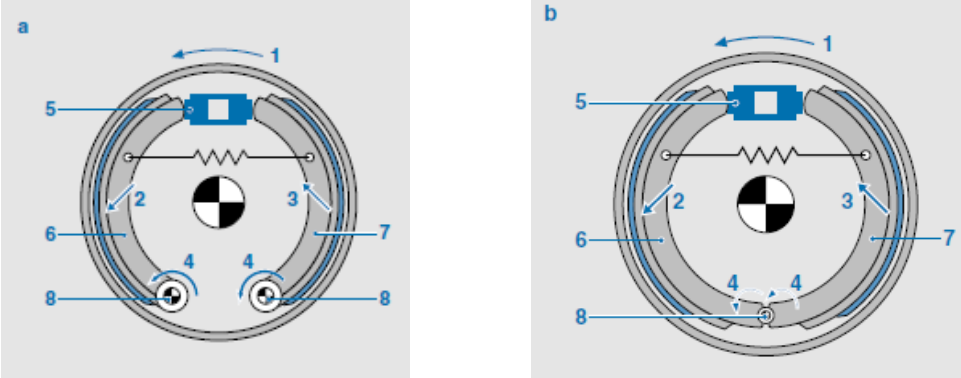


a) Brakes shoe with a fixed pivot point (single pivot point)
b) Brake shoe with a fixed pivot point (double pivot point)
c) Parallel-guided brake shoe
d) Obliquely guided brake shoe

Brake shoes with a fixed pivot point may wear unevenly, since these brake shoes are not self-centering like floating brake shoes. In addition, the trailing brake shoe may experience self-reduction (reduction of the braking force applied, opposite of self-amplification).

For the most part, drum brakes with floating brake shoes where self-reduction does not occur are used in automobiles today.

The most commonly encountered drum brake design today is the simplex drum brake.



a) Brakes shoes with 2 single pivot points

b) Brakes shoes with 1 double pivot point

1 Direction of brake drum rotation (driving forward)
2 Self-amplification
3 Self-reduction
4 Torque
5 Double-acting wheel cylinder
6 Leading brake shoe
7 Trailing brake shoe
8 Brake shoe bearing (pivot point)

In the driving position, tension springs pull the two brake shoes away from the brake drum so that there is an air gap between the contact surface of the drum and the brake linings. On simplex brakes, a double-acting hydraulic wheel brake cylinder generates the braking force applied by the brake shoes when braking by converting the hydraulic pressure into a mechanical force. This causes the brake linings on leading and trailing brake shoes to be pressed against the brake drum. On the side opposite the wheel brake cylinder, the brake shoes are mounted on a support bearing attached to the anchor plate.

The leading brake shoe (primary shoe) generates a higher percentage of the braking torque than the trailing brake shoe (secondary shoe). Wear on the primary lining is consequently higher. To compensate, this lining is thicker or longer.

Tips for replacing parts on drum brakes

When checking the braking action, pay attention to all details; this will allow you to identify numerous typical deficiencies already on the test stand. If, for instance, the braking force fluctuates, this is a sign of warped brake drums.

The brake drum must be replaced when the thickness has dropped below the minimum value or cracks appear. The important point is to always change all drums on the axle!

Wheel brake cylinders must be replaced when the dust boots are defective or leaking at some spots. Otherwise, brake fluid can get onto the brake shoes and compromise the braking action.

Brake shoes in drum brakes should be replaced every 5 years at the latest. When replacing

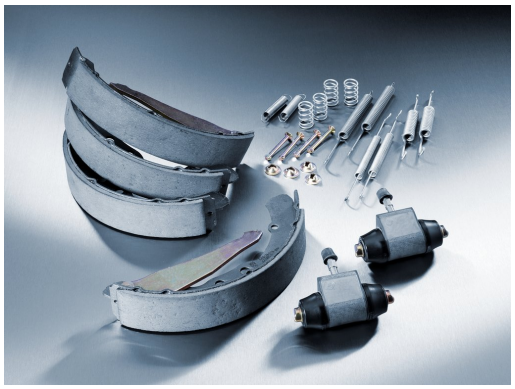
the brake shoes, it is important to use complete repair kits. The initial position of the brake shoes is set by the automatic adjuster. For it to work properly, the hand brake cables must be entirely slack. Under no circumstances should the air gap be adjusted by tightening the hand brake cables.

Brake shoes in drum brakes and wheel brake cylinders have similar service life expectancies. They should thus be replaced together – every 5 years at the latest. This is more cost-effective for customers than a follow-up repair within a short period of time. For this work, Bosch offers Kit Pro and Kit Super Pro.

Bosch Kit Pro and Kit Super Pro

Kit Pro offers all required parts plus the installation instructions. Kit Super Pro is supplied with pre-adjusted components, including the adjuster.

Pro Kit



2 Wheel brake cylinder
2 Brake shoe sets
Fasteners

Super Pro Kit

2 Wheel brake cylinder
2 Brake shoe sets
Adjuster and fasteners
All individual components are pre-assembled

Drum brake kits simplify ordering, since only one item number is needed for all parts. They can be stored in less space. Incorrect assembly can be avoided with such kits. Moreover, the time needed for installation is about 50 percent less with the Super Pro Kit.

With the Pro Kit you can repair 85 percent of all vehicles; with the Super Pro Kit, 95 percent.