

# The brake system of a motor vehicle



With advances in automobile technology, braking systems have also been constantly evolving to offer precision braking facility in modern cars. The two prime braking technologies developed over the course of time are drum brakes and disc brakes. In the following essay I am going to describe the two different types and point out the advantages and disadvantages of drum and disc brakes. Before we make a distinction between discs and drums, let me explain the basic working principle of any braking system installed in cars.

When brakes are applied, vehicles come to a halt through application of friction against the wheels. Heat is generated in the process. The conversion of kinetic energy of the rotating wheels into heat slows down the wheel. Early automotive brake systems used a drum design at all four wheels. They were called drum brakes because the components were housed in a round drum that rotated along with the wheel. Inside was a set of shoes that, when the brake pedal was pressed, would force the shoes against the drum and slow the wheel.

Fluid was used to transfer the movement of the brake pedal into the movement of the brake shoes. The newer one, the disc brake, works on the same basic principles to slow a vehicle, but their design is far superior to that of drum brakes. Instead of housing the major components within a metal drum, disc brakes use a slim rotor and small caliper to halt wheel movement. Within the caliper are two brake pads, one on each side of the rotor, that clamp together when the brake pedal is pressed. Once again, fluid is used to transfer the movement of the brake pedal into the movement of the brake pads.

Now I will highlight the difference between drum and disc brakes. Which brake system are better and why, if any?! Disc brakes operate better than drum brakes because of the difference in dissipation of heat in both systems. The drum brake is an internal system, with the brake pads being held inside of the brake drum. As such, it is easy for heat to build up inside the unit. When heat builds up, the brakes fade and lose their stopping power. Disc brakes, on the other hand, are more exposed. This allows for the brake disc and pads to cool much easier and for the brakes to hold their stopping power.

Disc brakes also perform better in wet weather, because centrifugal force tends to fling water off the brake disc and keep it dry, whereas drum brakes will collect some water on the inside surface where the brake shoes contact. The advantage of drum brakes is that they are much cheaper to manufacture than disc brakes. Also when having brake work done, the replacement of drums or shoes is less expensive than that of calipers or discs. As well, drums can double as a parking brake, further reducing the cost of production of a vehicle.

With disc brakes on all four wheels, manufacturers have to build a separate parking brake in the brake rotor, adding to its cost. All in all, the main reason that drum brakes are still in use is because of cost. Today most cars have a combination of disc brakes and drum brakes in their functioning. Braking causes the car's weight to shift forward, and as a result about 70% of the work is done by the front brakes. By fitting disc brakes to the front wheels and drum brakes to the rear wheels, manufacturers can provide most of the benefits of disc brakes while lowering costs.