

# STUDY ON DRUM BRAKE

A drum brake is a brake in which the friction is caused by a set of shoes or pads that press against the inner surface of a rotating drum. The drum is connected to a rotating wheel.

## Mechanism

The modern automobile drum brake was invented in 1902 by Louis Renault, though a less-sophisticated drum brake had been used by Maybach a year earlier. In the first drum brakes, the shoes were mechanically operated with levers and rods or cables. From the mid-1930s the shoes were operated with oil pressure in a small wheel cylinder and pistons, though some vehicles continued with purely-mechanical systems for decades. Some designs have two wheel cylinders.

The shoes in drum brakes are subject to wear and the brakes needed to be adjusted regularly until the 1950s introduction of self adjusting drum brakes. Self adjusting brakes operate by a ratchet mechanism engaged as the hand brakes is applied. If the travel of the handbrake actuator lever exceeds a certain amount, the ratchet turns an adjuster screw that moves the brake shoes toward the drum.

## Characteristics

Drum brakes, depending on the way the shoes are hinged, can have a "self-servo" characteristic. This increases stopping power without any additional effort by the driver because the rotation of the drum drags the shoes around with it, increasing the force holding them together. This can be used to make a very powerful brake (as on the rear axles of large commercial vehicles), but it does reduce the ability of the driver

to modulate the brakes sensitively. The disc brake has no self-servo effect because the pads act perpendicularly to the rotating disc.

### Improvements

Early type brake shoes contained asbestos. When working on brake systems of older cars, care must be taken not to inhale any dust present in the brake assembly. Since the introduction of ceramic and kevlar linings, a majority of daily-driven older vehicles have been fitted with asbestos-free linings since.

Another type of drum brake is where a friction belt is wrapped around the outside of the drum and tightened. This type predated the modern drum brake, and was later often used for the parking brake on the centraldriveshaft. This type of band brake is also used in automatic transmissions and aerobic exercise cycling equipment.

In the 1960s and 1970s brake drums on the front wheels of cars were gradually replaced with disc brakes and now many cars use disc brakes on all wheels. Due to its inehrent disadvantages drum brakes have been superseded in most modern automobiles and light trucks with at least front wheel (often now four wheel) disc brakes.

### Disadvantages

Drum brakes with internal shoes have a particular disadvantage; when the drums are heated by hard braking the diameter of the drum increases due to the expansion of the material and the brakes must be further depressed to obtain effective braking action. This increase of pedal motion is known as brake fade and can lead to brake failure in extreme circumstances.

## Uses

Drum brakes are still used in some modern cars owing to weight and cost advantages.

An advanced technology hybrid car using drum rear brakes is the Toyota Prius.

(Hybrid vehicles greatly reduce everyday wear on braking systems owing to their energy recovery motor-generators.)

## Maintenance

Before 1984, it was common to re-arc brake shoes to match the arc within brake drums; the machinery used has been phased out.

Source : [http://engineering.wikia.com/wiki/Drum\\_brake](http://engineering.wikia.com/wiki/Drum_brake)