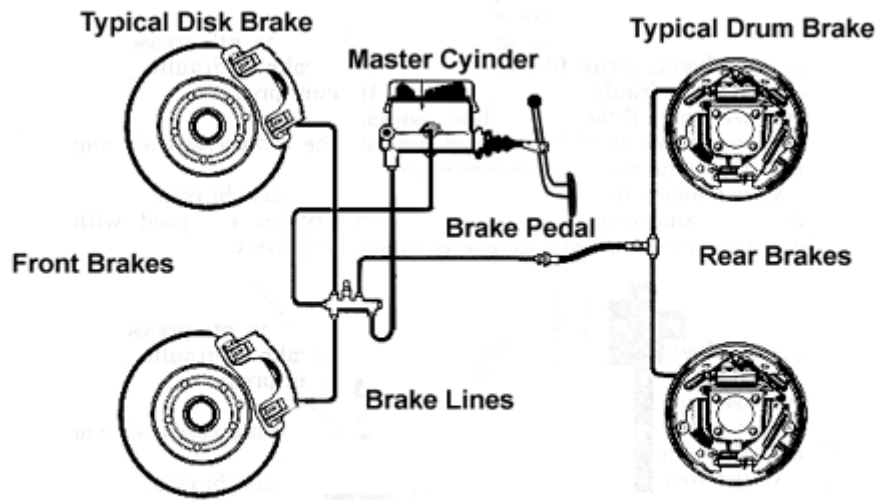
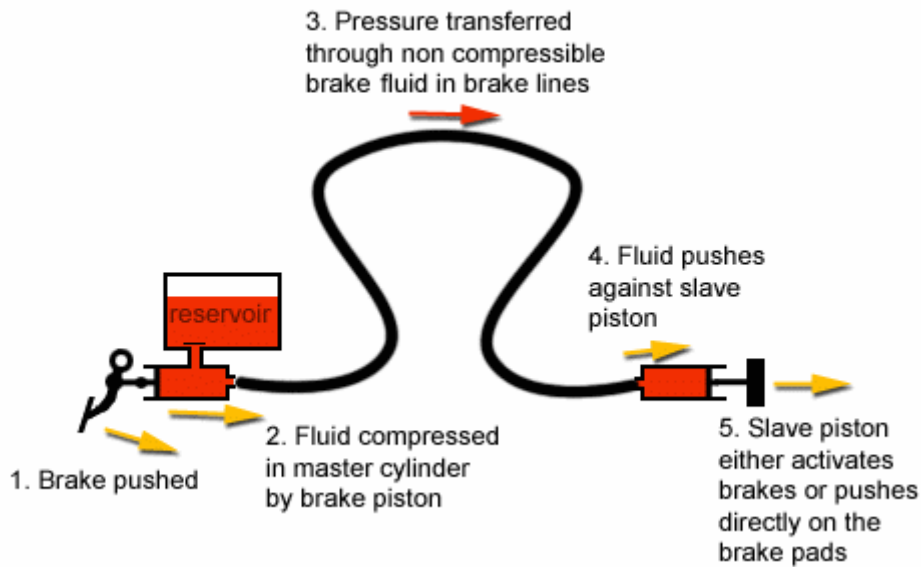


# Hydraulic braking system



Typical Automotive Braking System



## Basics

1. The old system of mechanical brakes gave way to the use of hydraulics in order to achieve a smoother and faster stoppage of the vehicle. Hydraulic systems have pedals that are connected to pistons. These pistons are housed in cylinders by tubes with flexible sections. These are then connected to separate cylinders found in the wheels. In more modern designs, the front and rear portions are separated.

## Leverage

2. One of the principles that work in hydraulic car brakes is leverage. With leverage, the force given at one section is transmitted to another location using an incompressible fluid which is usually an oil-based substance. Like other brake systems, hydraulics work by multiplying the force exerted. In the case of a hydraulic system, applying a downward force on one piston transmits it to another through the oil found in the cylinder. Hydraulic systems have pipes that can be of any length or shape which makes it easier to reach the pistons.

## Mechanism

3. When the driver of the vehicle presses the brake pedal, he is actually exerting force on the brake's master cylinder. The master cylinder is a device that allows two pistons to be used in the same cylinder. Four secondary pistons, called slave pistons, are located at each wheel and press the brake pads to stop the car. Most car models on the road today make use of two master cylinders controlling two slave cylinders. This function acts as a safeguard--- in the event one of the master cylinders malfunctions, the brake system will still stop the car.

## Multiplication

4. Multiplying the force using a hydraulic car brake is fairly simple. Much like in other mechanisms, a hydraulic car brake makes use of a theory in physics which states that force can be exchanged for distance. To do this, the size of the piston and the cylinder change relative to others. It is the area size of the piston that determines the variable by which the force exerted is multiplied. This is important considering that friction is needed to stop the vehicle.

## Friction

5. Friction is a force integral to how braking systems function. Without friction, it is practically impossible for the car to stop. Friction is a term used to refer to how difficult it is for one item to move across another. Take note that the amount of force needed to move an object is proportional to how much it weighs. This is a principle that is applicable in the case of how hydraulic car

brakes work wherein a brake pad presses against a spinning object. The more force that is used on the brake pads, the greater force can be used to stop the vehicle.