

OBJECTIVES:

When you complete this section, you will be able to:

- Draw a diagram of the automotive brake system, identifying important parts.
- List the major problems affecting the components of the brake system covered in this chapter, and outline the solutions to those problems.
- Explain how the master cylinder works and its importance to the brake system.

THE BRAKE SYSTEM

Although the brake system is a *system*, i.e., all the parts are connected together, it's easier to study these parts if we divide them into two groups. One group consists of all those parts that are housed in the wheel assembly, what we're usually referring to when we talk about the brakes. The other group of components are all the different parts outside of the wheel assembly: the master cylinder, power boosters, hydraulic valves and brake lines and hoses. We have included one part—the wheel cylinder—in this section even though it is physically located in the wheel assembly. It fits here because it is one end point of the hydraulic action that begins when the driver mashes the brake pedal. The hydraulic pressure goes through the system and—at the brakes—the wheel cylinders or calipers convert the hydraulic pressure into a mechanical action: the brake shoe is pressed against the drum or the disc pad against the rotor.

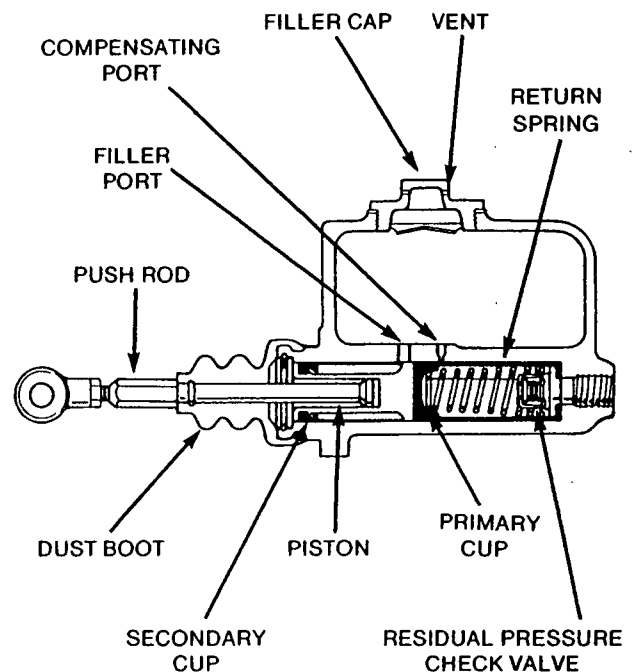
Before beginning the following section, look at the illustration in the front of the manual and locate each of the brake system components we just mentioned. If you can keep a mental image of the brake system in mind as you study this material, it will be much easier to understand.

THE MASTER CYLINDER

The master cylinder is a form of hydraulic pump. Pressure is applied to it from the brake pedal, and it pumps brake fluid through the brake lines to the wheel cylinders, activating the brakes. The importance of the master cylinder is easy to understand: if it doesn't work, the brake system doesn't work.

All master cylinders consist of the following components:

- Primary Cup
- Secondary Cup
- Spring
- Piston
- Housing
- Reservoir
- Flexible Diaphragm
- Cap



(Figure 10) The Single Piston Cylinder

If you look at the illustration above, you can see how the master cylinder works. When the piston is pushed forward, brake fluid is pushed through the lines to the brakes. The check valve holds a slight line pressure on the wheel cylinder cups to prevent air from entering the brake system at the wheel cylinder if the brake pedal is released quickly or if the cups are worn.

As an additional safety factor, a law was passed requiring a "tandem" master cylinder on cars and light trucks manufactured in 1967 and after. As you can see in the illustration (Figure 11), the tandem master cylinder is basically two single master cylinders in one housing; it has two pistons, reservoirs, and outlet ports. Each piston has a primary and secondary cup, and