

**Bulletin BPI 00-24**

## **Brake Bleeding**

The process of removing air from the hydraulic brake system is called bleeding. Air is compressible, and any air in the system will be compressed during brake application, causing a spongy pedal. When bleeding brakes, using the proper sequence is recommended. It saves time and ensures that the entire system is bled.

The usual RWD procedure is to bleed the components in the following sequence:

1. Master cylinder
2. Combination valve if equipped with a bleeder screw.
3. Wheel cylinders and calipers in succession, beginning with the longest brake line and ending with the shortest. On most vehicles the sequence will be right rear, left rear, right front, left front. This may or may not be correct for every vehicle; the best advice is to a bleeding sequence manual. Doing so you may actually find the sequence to be.
4. A FWD diagonally split system; sequence will be entirely different and will vary upon manufacture.

### **GENERAL TIPS:**

If a caliper has two bleeder screws, bleed the inboard section first and then the outboard section. If a drum brake has two wheel cylinders, bleed the lower one first, followed by the upper one. Most vehicles with ABS require a special bleeding procedure. Some are bled manually, some by pressure bleeding, and some require a scan tool to activate the pump or solenoids. Check the specific manufacturer's recommendations.

These are the (4) most common methods used:

1. Gravity bleeding
2. Manual bleeding
3. Pressure bleeding
4. Vacuum bleeding

**Gravity bleeding:** The gravity method simply lets the fluid run down into the calipers and wheel cylinders.

**Manual bleeding** is the most commonly used method. The master cylinder and brake pedal are used as a pump to cause fluid to flow through an open bleeder screw. This fluid flow should flush air out.

**Manual bleeding** should be performed smoothly so as not to create turbulence in the fluid, which causes foaming. Foamy fluid contains tiny air bubbles that are very hard to remove.

**Pressure bleeding** normally uses a pressurized tank of brake fluid to cause fluid to flow through the bleeder screws. Pressure bleeding has the advantage of being a one-man operation, and is an effective method of removing air and flushing the hydraulic circuits.

**Vacuum bleeding** uses a pump to pull fluid and air out of the bleeder screw. It is fairly simple and is an effective operation.

**Brake Fluid:** To ensure a maximum brake-fluid boiling point and to reduce corrosion, a system that uses **DOT 3** or **DOT 4** brake fluid should have the fluid changed every two years. This is a rather simple operation but one that is not commonly done. It is highly recommended for two main reasons: safety and economics. Many FWD vehicles in heavy-traffic situations will have brake fluid close to the boiling point; this will cause a low pedal as the fluid boils. Quick-take-up master cylinders and ABS hydraulic modulators are very expensive parts to replace, and old fluid can ruin them.