

MASTER CYLINDER BENCH BLEEDING INSTRUCTIONS

THE PICTORIAL ILLUSTRATIONS IN THIS INSTRUCTION SHEET ARE FOR DEMONSTRATION PURPOSES. YOUR MASTER CYLINDER MAY VARY IN SIZE AND SHAPE. IF THERE IS ANY CONFUSION AND/OR LACK OF UNDERSTANDING PER THESE INSTRUCTIONS CONSULT THE SERVICE MANUAL FOR YOUR MAKE, MODEL AND YEAR.

WARNING: Do not attempt to install this master cylinder without bench bleeding it prior to installation on the vehicle. Bench bleeding removes air from the cylinder bore. Without bench bleeding, satisfactory braking will be difficult to obtain.

Use only new brake fluid that meets or exceeds DOT-3 specifications. A master cylinder may be bench bled in one of the following three methods:

METHOD A: Bench Bleeding using KWB100/UB100 Bleeder (Figure 1)

1) Mount the master cylinder to the multiple adapter plate. Use 2 Phillips screws. If the master cylinder does not line up with at least two screws.

2) Select the correct plug for the outlet ports or port. Some applications require adapters. If the master cylinder has proportioning valves, install them into the outlet ports and plug the other outlet ports.

3) Loosen pushrod bolt, move handle to the rest position and adjust the pushrod until it just touches the piston.

4) Fill the master cylinder reservoir $\frac{1}{4}$ " from the top with new brake fluid.

5) Reinstall the reservoir cap so brake fluid does not spray from the reservoir.

6) Move the handle slowly up and down. Use full strokes. On single master cylinders, use strokes of 1" or less to prevent the secondary seal from moving past the breather port. Otherwise, fluid will leak from the rear of the master cylinder. Also on step-down quick take-up master cylinders, wait 15 seconds between strokes.

7) Once the master cylinder is bled, the handle will feel firm. The pushrod will only depress the pistons slightly. Usually it will be around $\frac{1}{8}$ ".

8) The master cylinder is now bled. It can be removed and installed. The plugs can be removed to install the brake lines or temporary dust plugs. The installer should be warned that these plugs should not be removed until the master cylinder is installed. This prevents air from entering the cylinder bore and brake fluid from leaking out of the bore. It may also prevent damage to painted surfaces from the brake fluid leakage.

9) The installer must bleed the brake system to free it completely of air.

10) After installing a master cylinder, depress the pedal with light and heavy pressure. Do this with the engine on and off. The brake pedal should not bleed down if the hydraulic brake system is operating normally.

Many times a master cylinder is blamed for a low brake pedal. A brake pedal that goes to the floor or doesn't work may be due to air in the hydraulic system, oversize rear drums, worn shoes, drum brakes (types with integral parking brake), drum brakes, or a hydraulic leak. To isolate this problem, the installer can plug the outlets on the master cylinder. If the pedal is firm, high or hard, the master cylinder is not the problem. Therefore, the installer can isolate the hydraulic brake problem, saving costly diagnostic time.

Many warranty decisions for master cylinders are based on the operating condition of the master cylinder.

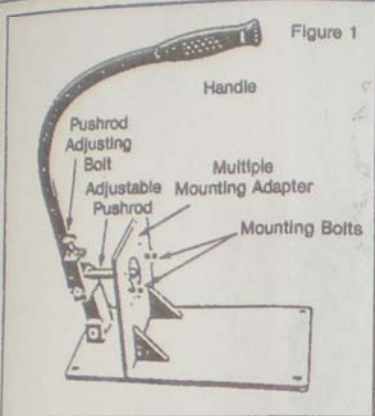
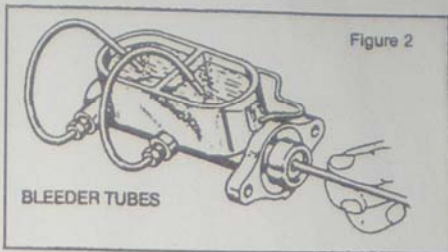


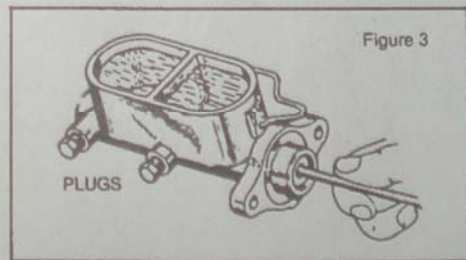
Figure 1

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METHOD B: Bench Bleeding using Bleeder Tubes (Figure 2)

- 1) Clamp master cylinder securely by the mounting flange in a vise.
- 2) Thread bleeder tubes into the outlet ports of the master cylinder and bend the tubes into the master cylinder reservoirs. Secure the tubes to make sure they stay in place.
- 3) Fill the reservoir with new brake fluid to approximately $\frac{1}{4}$ " from the top. Be sure the ends of the tubes are covered by the brake fluid.
- 4) Using a blunt tool, apply and release the master cylinder piston repeatedly, using short strokes of $\frac{3}{4}$ " to 1". Repeat this step until no air bubbles are seen coming from the ends of the bleeder tubes.
- 5) Remove master cylinder from vise and install on vehicle.
- 6) Now remove the bleeder tubes and nuts from the outlet ports and attach the vehicle's brake lines.
- 7) The wheel cylinders and calipers must now be bled to remove any remaining air from the system. Refer to Service Manual for proper bleeding sequence.



METHOD C: Bench Bleeding using Outlet Port Plugs (Figure 3)

- 1) Clamp master cylinder securely by the mounting flange in a vise.
- 2) Plug the outlet ports. Be sure the ports are completely sealed.
- 3) Fill the reservoir with new brake fluid to approximately $\frac{1}{4}$ " from the top.
- 4) Using a blunt tool, apply and release the master cylinder piston repeatedly. Air bubbles will emerge from the small holes in the master cylinder reservoir. Continue the strokes until the piston can no longer be pumped.
- 5) Remove master cylinder from vise and install on vehicle.
- 6) Now remove port plugs and attach the vehicle's brake lines.