FIGURE 56.1 Bench bleeding a master cylinder. Always clamp a master cylinder in a vise by the mounting flange to prevent distortion of the cylinder bore. Bench bleeding tubes can also be used that route the fluid back into the reservoir.

FIGURE 56.2 Typical bleeder valve from a disc brake caliper. The arrows point to the taper section that does the actual sealing. It is this taper that requires a shock to loosen. If the bleeder is simply turned with a wrench, the bleeder usually breaks off because the tapered part at the bottom remains adhered to the caliper or wheel cylinder. Once loosened, brake fluid flows around the taper and out through the hole in the side of the bleeder valve. The hole is clogged in this example and needs to be cleaned out.

FIGURE 56.3 Typical bleeder locations. Note that the combination valve and master cylinder shown do not have bleeder valves; therefore, bleeding is accomplished by loosening the brake line at the outlet ports.

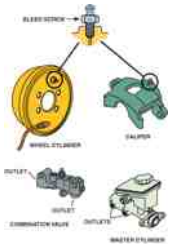

FIGURE 56.4 Using an air punch next to the bleeder valve to help "break the taper" on the bleeder valve.

FIGURE 56.5 Most vehicle manufacturers recommend starting the brake bleeding process at the rear wheel farthest from the master cylinder.

FIGURE 56.6 Bleeding brakes using clear plastic tubing makes it easy to see air bubbles. Submerging the hose in a container of clean brake fluid helps ensure that all of the air will be purged by the system.

FIGURE 56.7 Using a compressed air-powered vacuum bleeder.

FIGURE 56.8 Vacuum bleeding uses atmospheric pressure to force brake fluid through the hydraulic system.

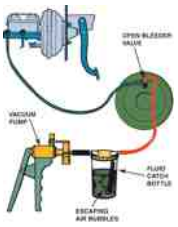

FIGURE 56.9 Gravity bleeding is simply opening the bleeder valve and allowing gravity to force the brake fluid out of the bleeder valve. Because air is lighter than brake fluid, all of the air escapes before the brake fluid runs out.

FIGURE 56.10 A typical pressure bleeder. The brake fluid inside is pressurized with air pressure in the air chamber. This air pressure is applied to the brake fluid in the upper section. A rubber diaphragm separates the air from the brake fluid.

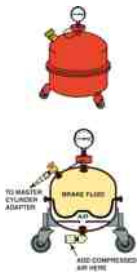

FIGURE 56.11 Brake fluid under pressure from the power bleeder is applied to the top of the master cylinder. It is very important that the proper adapter be used for the master cylinder. Failure to use the correct adapter or failure to release the pressure on the brake fluid before removing the adapter can cause fluid to escape under pressure.

FIGURE 56.12 Metering valve override tool on a General Motors vehicle.

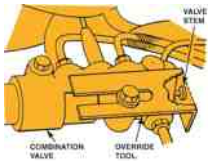

FIGURE 56.13 Pull-out-type metering valves being held out using a special override tool.

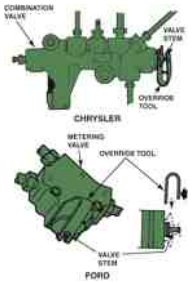

FIGURE 56.14 A turkey baster can be used to remove the old brake fluid from the master cylinder reservoir. A rubber hose was attached to the end of the turkey baster to get access to the brake fluid.