

## PROOF

## The Power Bleeder

By Mitchell Sam Rossi

PHOTOS BY THE AUTHOR

**T**he Power Bleeder by Motive Products simplifies one of the most essential tasks undertaken by a home mechanic tinkering on his car—bleeding the brake system. Unlike other brake flushing systems currently on the market, the Power Bleeder does not depend on an air compressor. Nor does it create a vacuum to draw the system's dirty fluid into the unit itself.

Instead, the Power Bleeder incorporates a sturdy, 2-qt polyethylene tank which is pressurized to force hydraulic fluid into the car's reservoir. Pressurization comes from a small hand pump integrated into the unit's lid. The tank is also equipped with a pressure gauge to ensure the system is not overly boosted.

While there are accessories to use the Power Bleeder with Asian and domestic automobiles, the unit was originally designed to work with European cars and thus uses a threaded cap to attach to the car's reservoir.

In pristine condition, brakes are designed as a closed system, but brake fluid is highly hygroscopic. This ability to draw moisture from the air contaminates the fluid and lowers its boiling point. When the brake pads and discs generate heat through friction, the water in the fluid releases air bubbles into the lines. The bubbles disrupt the hydraulic flow and give the car's brake pedal a soft, mushy feeling. The tainted fluid can also corrode the master cylinder and calipers. Thus, for a street car operated under normal conditions, manufacturers often recommend completely flushing the braking system every one to two years.

Running a car in competition places additional strains on the brake system and its hydraulic fluid. Over a two- or three-day event, racers often bleed their brakes several times to ensure optimal performance. Thus, as a weekend contender, I was eager to test the Power Bleeder's worthiness before adding it to my already burgeoning cabinet of track tools.

The opportunity to examine the Power Bleeder came when a friend brought his 1970 911S to the house for a Sunday afternoon of minor repairs and improvements. We were replacing the car's original rubber brake lines with stainless-steel braided



lines and installing new brake pads and bleeder valves. The extent of these upgrades made this the perfect time to flush the entire braking system.

Taking a cursory read of the instructions, we filled the car's reservoir and added a quart of fresh ATE Super Blue Racing fluid to the tank. Once the reservoir cap was attached, we energized the Power Bleeder. Blue fluid immediately began to spray from the overflow hose under the nose of the car. Our mistake, we admit it.

Re-reading the instructions, we found it clearly stated that the brake system should be tested under slight pressure before the fluid is added. This is to ensure that the system is fluid-tight to avoid the very blunder we stumbled into. The overflow vent would have been detected by a drop in the air gauge needle and not the indigo mess we created across the garage floor.

Sealing the overflow tube and making sure the system would now maintain pressure, we continued with the step-by-step instructions. We added another quart of brake fluid, secured the pump cap and slowly increased the pressure inside the tank.

We then followed normal brake-flushing procedure for the

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911. Working from the furthest caliper from the master cylinder to the closest, we extracted the old fluid while the Power Bleeder injected new fluid into the reservoir. With the tank holding 2 quarts, we were never concerned about running the reservoir dry, which would have introduced air into the lines and forced us to start the procedure over again. We also were able to flush all four calipers without the need to re-pressurize the tank.

The one-man system worked surprisingly well. The only problem we envisioned was that the unit pressurizes a portion of the braking system designed to work at only ambient pressures.


The car's brake pressure is increased by the movement of a piston inside the master cylinder when the connecting rod of the brake pedal presses against it.

The boosted pressure on the fluid is immediately transferred to the caliper's pistons. The caliper pistons, in turn, transmit this action to the brake pads, causing them to squeeze against the brake discs and slow the vehicle.

The tubes that feed hydraulic fluid to the master cylinder from the reservoir, however, are outside the pressurized system. Thus, in a 911, they are merely pressed into their receptacles on the master cylinder with rubber grommets. Subjected to the pressure of the Power Bleeder, the passive seals of these tubes could conceivably be ruptured.

While the instructions suggest keeping the pressure in the tank below 20 psi, we kept it under 10 psi for fear of blowing out these feed tubes. Yet, even at this lower level the Power Bleeder made flushing the system extremely easy.

Finally, here was a tool that no longer required a friend or reluctant spouse to sit in the driver's seat pumping the brake pedal while the other Sunday mechanic worked his way around the car yelling, "Pump, pump, hold!" Flushing the entire system was simply a matter of hooking on the bleeder hose, opening the valve, watching for fresh fluid, then closing it off and moving on.

Used carefully, the Power Bleeder is an excellent tool worthy of any enthusiast's tool bin, alongside the torque wrench and tire gauge. 

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