MAKING PRESSURE IS THE NAME OF THE GAME

A new Brake System Diagnostic Kit, from Master Power Brakes, will help you check your installation and find the problems.

Text and Photos by Jerry Slattery

Building a car is a learning experience, especially during the modification process when you may be adding a different front subframe from another vehicle, or adding a new rear end or rear subframe to your Chevy. Most of us are trying to learn something as we continue this "adapting" process. Along with some of these modifications you're going to have non-stock brake items you hope will work together. Adapting different brake components together into your favorite ride may bring some unusual problems. A lot of us thought we new what we were doing and assumed all brake components to work together, then when we have a problem, we don't know how to find the answer, or sometimes, where to start. This is where a good little brake test kit would come in handy. Bingo! Master Power Brakes, probably the largest aftermarket brake component manufacturer for the performance industry, has developed a universal test kit to trouble-shoot your complete brake system. This Brake System Diagnostic Kit was created to help those "students" who are mixing and matching components to up-grade their braking system for increased performance. Bottom line: Making Pressure is the name of the game, and this kit starts with bleeding the master cylinder/combination valve, checks everything in between and ends with a pressure gauge at your master cylinder and/or caliper or wheel cylinder so you can determine that each component is working effectively. This is a universal problem solving kit that can be used many times to help you find the problem (or problems) where ever it is in your system.

The universal kit, for just about any car or truck, includes a master cylinder/booster depth gauge for checking the distance between the booster pushrod and the M/C seat. This also insures you have the correct master cylinder and the correct booster pushrod. A 30-inch vacuum gauge and a length of vacuum hose with gauge fitting on the end have been included, so you can check the engine's vacuum port to the booster. Seven bleeder-port adapter fittings are included for installing the pressure gauge on all the different wheel cylinders and calipers. This ensures that in fact you have pressure at all points in the system. Four, six-inch sections of brake lines (and assorted fittings) are included, each with a different adapter-nut to connect the M/C or the combination valve (or both together) for pressure testing the outlets with the 2000psi gauge included in the kit. One syringe for bench-bleeding the M/C and combination valve and 4 plastic port plugs to isolate the bleeding process in the M/C and combination valve.

There's only one way to test the kit and that was to find a typical scenario car that would have some mixed components, in other words, components that would not come stock on that vehicle. For our test, we picked a (disc/drum power brake operated) '57 Chevy Delivery owned By Dan McIntyre that had a '79 Trans Am replacement front subframe. This subframe (much like a '79 Camaro subrame) features disc brakes with 11-inch diameter rotors and a 9-inch single-diaphragm vacuum booster to power the brake system through an original combination valve. The 9-inch rear end features wheel cylinders and shoes inside the10-inch drum brakes. The engine in Dan's '57 delivery is a BB Chevy with a cam and one 4-bbl carb.

Some pretty interesting answers come out of this kit even if you don't have any braking problems or may not think you have any. You can actually find out the caliper clamping pressure at each front wheel or rear wheel cylinder-to-drum pressure. Did you ever check the intake manifold with a vacuum gauge to see how many inches of vacuum the engine produced to power your brake booster? The biggest thing I learned from this kit was the correct steps on how to effectively bench bleed a combination valve and master cylinder together or separately. The kit is not designed to test your daily driver's ABS system, however you can check some areas like the manifold vacuum or caliper clamping pressure.

This is a great investigative tool that can be used over-and-over again on any Chevy Classics or Chevy Muscle Cars, pickups or street rods. This is also a great kit when replacing components or if you want to check the installation of new parts or find out why the new parts aren't working. The instructions will walk you through ever step, and if you have a specific problem area you can't solve, you can always call the MPB tech line at (888) 533-1199, M-F 8am-to-5pm EST.

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#1 LEAD PHOTO

We picked Dan McIntyre's clean '57 Chevy Delivery as a typical candidate for the test kit, since it had some mixed-and-matched brake parts. The grafted front subframe was from a '79 Trans Am (identical to a Camaro) with 11-inch GM disc brakes with original (steel) combination valve and a 9-inch drum brake rear end. The stock 9-inch diameter booster and master cylinder were also retained. This combination seems to be a trouble spot for some builders, especially when things aren't working right. The BB Chevy engine also has a big-lobe cam, so we were interested in the amount of vacuum it would create. Dan really didn't have any braking problems, but with the big cam we were interested in the amount of vacuum it actually created

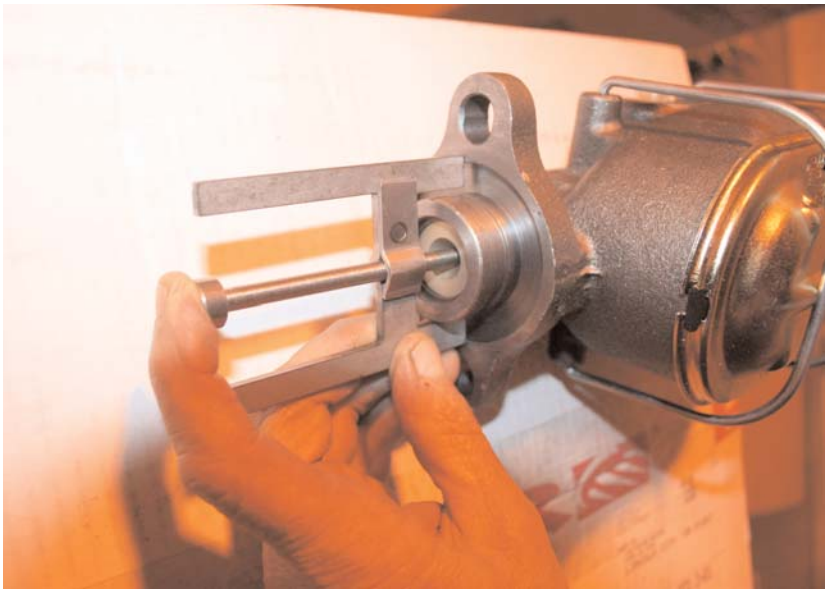
#2

The problem solving, universal Brake System Diagnostic Kit (#AC2004KX) is designed to trouble shoot the entire brake system. It is designed to find vacuum and pressure problems and shows you the correct way to bleed a brake system with a master cylinder and combination valve separately or together. It even provides a depth gauge to check the master cylinder/booster pushrod connection and provides adapter fittings for a vacuum gauge and a 2000psi gauge to make sure you have pressure at any point between the master cylinder and the wheels.

#3

Some of the adapter fitting provided in the kit include (top row) 7 different bleeder port adapter fittings to attach the pressure gauge to different calipers and wheel cylinders. The second row of brass fittings adapt the gauges to the brake system, including the master cylinder and combination valve ports using the 4 brake line adapters provided. The plastic plugs in the bottom row are for plugging and isolating the exit ports after bleeding the master cylinder and combination valve

#4 & #5

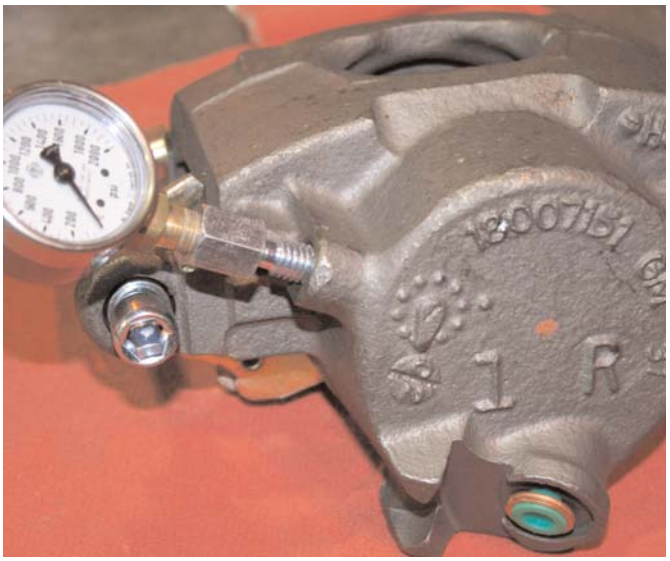


The master cylinder/booster reversible depth gauge will tell you the distance between the internal booster pushrod and the M/C seat. Thus making sure you in fact have the correct M/C and when connected together the distance between the pushrod and seat is .020-inch. With the short end of the tool seated on the M/C mounting flange, you simply push the center rod into the

seat and hold the center rod with your finger. Next, still holding rod with your finger, reverse the tool placing the long end of the gauge legs on the booster mounting face with the gauge pushrod over the booster pushrod hole. This will give you the distance between the pushrod and M/C seat.

#6 & #7

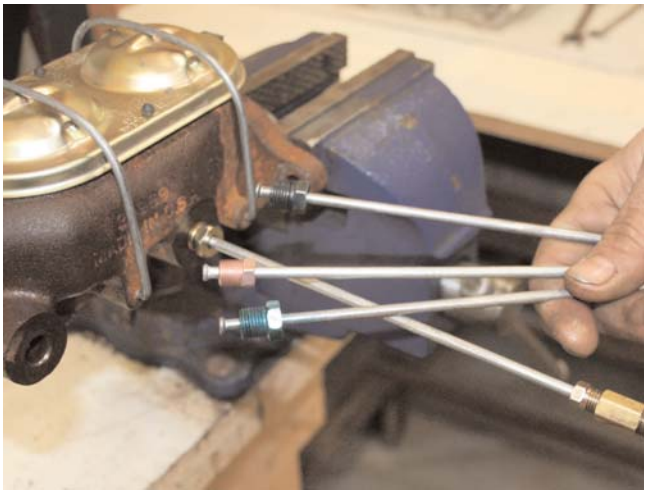
To check the pressure at the caliper or wheel cylinder, find one of the 7 different adapter fittings that matches your bleeder screw. The 2000psi gauge will screw directly into these fittings. Start the car (for a power system) and push hard on the brake pedal and have someone read the maximum pressure at each wheel and write the values on the last page of the instruction worksheet. Any air you may get into the caliper/wheel cylinder will be directly under the bleeder hole and will drain out of the hole or can be pressure bled.



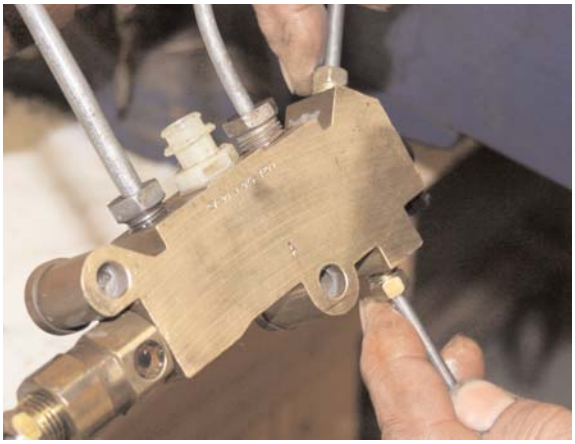
#8

With the gauge installed in the caliper bleeder port on Dan's '57 Delivery, the 9-inch diameter booster provided 1000psi at the front calipers. Master Power Brakes recommends 800psi or more at the caliper and 500psi at a wheel cylinder to determine that all brake parts "up stream" from the caliper to the M/C are in working order.

#9 & #10



When the master cylinder is installed in the car, you can check the pressure at the outlet ports with one of the four 6-inch long adapter lines provided in the kit. Each line has a different adapter fitting on one end (3/16 other ends) to fit the different M/C ports and the combination valve ports so the gauge can be attached to check the pressure at different points where you may think there is a related problem. Most combination valves have two front wheel ports and one rear wheel port. They can all be pressure tested with these adapter lines and the gauge provided.



#11 & #12

To bench bleed the master cylinder (in the vise), install the plastic plugs, provided in the kit, into the outlet ports of the M/C. Next, fill both M/C chambers with a good quality DOT 3 or 4 brake fluid and stroke the M/C piston smoothly and slowly and

observe the bubbles coming out. As you continue stroking the resistance will increase and the bubbles will diminish.

#12A

A second M/C only bleeding method can also be used by filling the syringe with brake fluid and plug one of the ports while

forcing fluid through the other port, and then reverse this process with the other outlet port. Keep the plugs in the ports until it is installed on the firewall, and then with the brake lines ready, remove each plug and install each line.

#13 & #14

To bleed the combination by itself, fill the syringe with fluid and inject the fluid at the rear brake port (large port) and watch the fluid come out of the exit line nearest the rear port. Next, inject brake fluid into one of the two front wheel ports while holding your thumb or finger over the second exit port and watch the bubbles and fluid come out. Then, reverse this process on the other front brake port. Now the M/C and the combination valve can be connected together and bled together in the car.

See the next step, #15.

#15 & #16

With the M/C and combination valve connected, you can now bleed the two components together on the bench. Using a full syringe, inject fluid into the rear port (yellow plug on the left) first and then plug it. Next, inject fluid into one of the two front wheel ports and then plug the port and repeat for the other front port and install the third plug. Finally you're ready to install it in the vehicle.

Now you can remove one plug at a time a reconnect your brakes lines. Last, you'll need to bleed the system at each wheel using the usual method, starting with the wheel farthest from the master cylinder.

#17

One of the last things we checked on Dan's '57 was the amount of vacuum produced by the BB cam. In all honesty, it produced only 5-inches of vacuum at the manifold, yet produced 1000psi at the caliper. That left us scratching our heads, wondering how that happened with only 5-inches of vacuum! After calling Master Power Brakes, they told us we should probably have a remote vacuum pump to maintain 18-inches of vacuum for more then just two, three or four good stops. The problem here is there is not enough vacuum to produce repeated pushing on the pedal and still have vacuum left. It could run out of vacuum some day when you need it most.

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Master Power Brakes recommends at least 18-inches of vacuum idling in Park