



**AUTOMOTIVE
BRAKE BLEEDING KIT
MODEL MV8020**

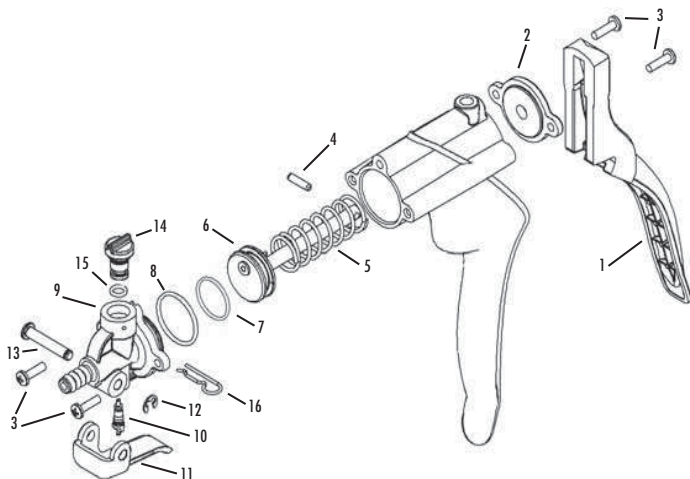
USER'S MANUAL



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SERVICE PARTS & ACCESSORIES



PUMP SERVICE KITS

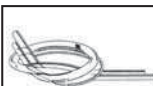
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MVA6913 – Bleed Adapter Kit



MVA6912 – Diagnostic Adapter Kit



822391 – Tubing (2 pieces)



MVA6910 – Reservoir Kit

OPTIONAL ACCESSORIES



MVA6825

MVA6832

The following optional accessories are designed to improve and expand the functionality and applications of Mityvac hand vacuum pumps.

MVA6825 Master Cylinder Refill Kit

Automatically replenishes brake or clutch master cylinder with new fluid during vacuum bleeding procedure. Adapts to standard 12 oz and 32 oz brake fluid bottles.

MVA6832 Clamp-On Auto-Refill Kit

Automatically replenishes brake or clutch master cylinder with new fluid during vacuum bleeding procedure. Includes 40 oz reservoir, or adapts to standard 12 oz and 32 oz brake fluid bottles. Offers improved features and functionality over MVA6825.



MVA6834

MVA6834 Plate-Style Auto-Refill Upgrade Kit

Upgrades MVA6832 to include refill applications with limited master cylinder clearance or non-standard reservoir necks. Requires purchase of MVA6832.



MVA6000

MVA6000 Complete Automotive Accessory Kit

Contains accessories for testing and diagnosing dozens of engine performance and automotive mechanical functions, and for one-person brake and hydraulic clutch bleeding.



MVA6005

MVA6007

MVA6005 16 Oz. Fluid Reservoir Kit

Large 16 oz fluid reservoir kit for brake bleeding and collection and dispensing of fluids.

MVA6845 Mason Jar Kit

Accessory kit for utilizing standard- and wide-mouth mason jars as fluid evacuation or pressure dispensing fluids.



MVA6845

MVA6001 Fluid Transfer Kit

Contains accessories for siphoning, transferring, extracting, or dispensing fluids using a Mityvac hand vacuum and/or pressure pump.



MVA6001

MVA6007 Dual Adapter Bleed Kit

For simultaneous bleeding of motorcycle dual caliper brake systems.



MVA6178

MVA6179

MVA6180

MVA6178 Vacuum Gauge w/ Inches Hg Scale

2" diameter gearless diaphragm gauge with 0 to 30 in. Hg major scale and 0 to -100 kpa scale of measure.

MVA6179 Vacuum Gauge w/ MBAR Scale

2-1/2" diameter gearless diaphragm gauge with 0 to -1000 millibar major scale and 0 to 30 inches Mercury scale.

MVA6180 Vacuum Gauge w/ KPA Scale

2" diameter gearless diaphragm gauge with 0 to -100 kpa scale of measure.

THE PUMP

The vacuum pump is an extremely versatile service tool that can be used to perform a number of useful tasks. The pump and its accessories are useful to transfer fluids, help to bleed brakes and aid in other tasks.

DESCRIPTION

The hand-held vacuum pump is simple, accurate, easy to use, and has many applications. It consists of a pump body, moveable handle and connection fitting. The pump is easily held in your hand, and when the handle is squeezed, vacuum is produced at the front fitting.

VACUUM RELEASE

The vacuum can be released by lifting up on the Release Lever. This action allows air to enter the system, thus relieving the vacuum. Vacuum will also be released when the hose is detached from the front fitting.

SPECIFICATIONS

Maximum Vacuum	Approx. 25" Hg
@ Sea Level:	(85 kPa)

Stroke Volume:	1 cu. in. (16cc)
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PROPER CARE

Your pump is a sturdily built, precision instrument. Do handle it carefully! Care for your pump and it will give you years of trouble-free service.

LUBRICATION

The factory-installed lubricant is silicone oil and should provide very long service. If you find it necessary to lubricate your pump, use silicone oil. If unavailable, you may use DOT 5 (not DOT 3) silicone-based brake fluid or a salad vegetable oil. Do not use petroleum based fluids or spray lubricants (WD-40, motor oil, etc.), as these will damage the pump.

BRAKE BLEEDING

Many brake systems today feature Anti-Lock functions and electronic controls. Many of these systems use a high pressure electric pump to keep the system pressurized. When bleeding or servicing, these systems require special procedures and cautions.

- ALWAYS observe the following precautions when servicing Anti-Lock brake system:
- ALWAYS wear safety goggles when servicing high pressure brake systems.
- ALWAYS depressurize the ABS system prior to adding fluid or attempting service or repair.
- Unless instructed to by the manufacturer's procedure, NEVER open a bleeder valve or loosen a hydraulic line while the ABS system is pressurized.
- ONLY use recommended brake fluids. DO NOT use silicone brake fluid in ABS equipped vehicles.
- Always refer to an appropriate repair manual for additional information on Anti-Lock brake systems.

DEPRESSURIZING ANTI-LOCK BRAKE SYSTEMS

Always refer to the vehicle owner's manual or appropriate service manual for additional information on depressurizing procedure. The procedure will work on most Anti-Lock brake systems. Ensure ignition switch is in the OFF position or disconnect the negative battery cable. Pump the brake pedal 25 to 40 times. A noticeable change is felt. Continue to pump the pedal a few additional times. This should eliminate most system pressure. Open fluid reservoir or brake lines carefully. Top off reservoir fluid and reconnect battery cable when finished.

BLEEDING ANTI-LOCK BRAKE SYSTEMS

Always refer to the vehicle owner's manual or appropriate service manual for manufacturer's brake bleeding procedure. The front brakes on most Anti-Lock brake systems may be bled in the conventional manner. Most hydraulic pump/pressure accumulator units are fitted with a bleeder valve

which must be bled when the system has lost fluid or is being replaced. Some vehicles require that the system be pressurized when the rear brakes are bled.

Some automotive manufacturers use bleeding procedures which require specialized equipment.

BRAKE LINE BLEEDING

Most low and soft pedal problems are caused by air in the hydraulic lines, which requires bleeding of the hydraulic system. By using the pump with brake bleeding accessories, the system can be bled easily. Follow a wheel-to-wheel sequence beginning with the wheel closest to the master cylinder.

The kit provides a simple, clean, and quick method for bleeding the fluid lines in the automotive brake system. The creation of a vacuum in the reservoir jar causes fluid to be drawn into the reservoir jar. It should be noted that a tiny stream of bubbles may be noticed in the hose after all of the air is bled from the lines. This is caused by air seeping around the threads of the loosened bleeder fitting and being drawn back through the fitting by the suction of the pump. Once the air is removed from within the system, these tiny bubbles will in no way jeopardize the bleeding operation, since they are present only at the fitting and do not enter the system. If you wish, you can put grease or Teflon tape around the threads of the fitting to eliminate most of the bubbles. The correct bleeding procedure follows:

- 1) Always make certain that the master cylinder reservoir is filled and that a supply of new, clean brake fluid of the proper type is on hand to top off the reservoir as the fluid level drops during bleeding. Make sure that all the bleeding fittings are clean prior to beginning of the bleeding procedure.
- 2) Bleed the hydraulic system in the following order:
 - A) Master cylinder bleeder fittings, if equipped. If installing a new or rebuilt master cylinder, follow the bench bleeding procedure which follows.
 - B) Bleeder fittings on the combination valve, if equipped.

BRAKE BLEEDING

C) Wheel cylinders and calipers in succession beginning with the wheel closest to the master cylinder, and working to the farthest one.

NOTE: Follow manufacturer's recommended bleeding sequence (if known). The procedure given in this article specifies to begin bleeding the wheel closest to master cylinder. Regardless of sequence used, always ensure all air is purged from system.

3) Slip 1½" of tubing between the pump and the lid of reservoir jar at port marked "TO PUMP" (FIGURE 1).

4) Attach 3½" plastic hose to the bottom of the cap.

5) Affix at least a 12" piece of tubing to the other reservoir jar port. Be certain that the cover of the reservoir jar is secure, but don't over tighten.

6) Select the appropriate adapter(s). The L-shaped universal adapters should fit snugly over the brake bleeding fitting in order to seal properly. The tapered adapters fit inside the thru-hole of fitting and will generally seal well when inserted tightly with a pressing and twisting motion. Attach adapter to reservoir hose.

7) Place wrench on brake bleeding fitting. Attach adapter and pump assembly, and pump 10 to 15 times.

NOTE: If bubbles coming out of the fitting are very small and even in size, the air is probably coming from within the system. It is not necessary to eliminate these bubbles as they do not affect brake operation. If desired, these bubbles can generally be eliminated by placing grease or Teflon tape around the threads, to act as a seal.

8) Open fitting slightly, only enough to cause the fluid to enter jar, usually ¼ to ½ turn.

9) After evacuating about 2" of fluid into the jar, close the fitting and refill the master cylinder. Repeat all previous steps on all remaining wheels. If fluid is not drawn into the jar after opening the fitting, make certain the lid of the jar is tight. You will not be able to produce the necessary vacuum in the jar if the lid does not fit securely. Occasionally some dirt will get into the brake line, in which case the pump may not be totally effective. If this happens, have someone touch the brake pedal once lightly, with the bleeding valve open, then proceed to use the pump.

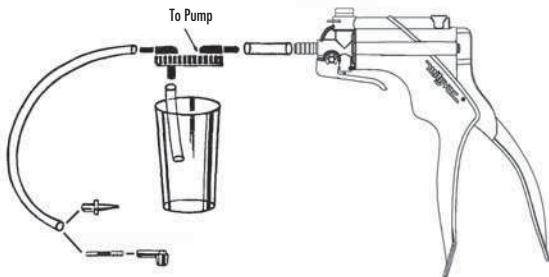


FIGURE 1: BRAKE BLEEDING KIT

BRAKE BLEEDING

MOTORCYCLE BLEEDING PROCEDURE

Before bleeding the system, ensure that:

- 1) The brake caliper pistons are free to move within the calipers.
- 2) The master cylinder piston is free to return to the end of its stroke, and
- 3) Inspect the line to ensure that all fittings are tight.

FRONT BRAKE

- 1) Pump brake lever to seat caliper pads against rotor.
- 2) Cover gas tank with plastic protective sheet if using DOT 3 fluid (not necessary if using DOT 5 fluid).
- 3) Remove master cylinder reservoir cap and fill reservoir.
- 4) Select the appropriate adapter(s). The L-shaped universal adapters should fit snugly over the brake bleeding fitting in order to seal properly. The tapered adapters fit inside the thru-hole of fitting and will generally seal well when inserted tightly with a pressing and twisting motion. Attach adapter to reservoir hose.
- 5) Pump several times to create vacuum. Crack bleeder valve with box wrench, extracting fluid into reservoir. (Stop and add fluid when master cylinder begins to get low. Do not allow air to enter line.). At this point, all air should be out of system and line full of fluid. (Note: if air is entering the pump hose from around bleeder fitting, remove bleeder fitting and apply Teflon tape to threaded portion of bleeder screw only. This will prevent air seepage around threads of bleeder screw.)
- 6) While maintaining vacuum on the pump line, tighten bleeder fitting.
- 7) Top off reservoir and reinstall cover. Check brake by pumping lever several times. Pedal should have a positive, solid feel. If not, repeat bleeding process as more air may have entered the system. Inspect line to ensure all fittings are tight. If brake still feels slack, consult a service technician.

For dual disc front brakes, repeat bleeding process as though there are two separate systems.

REAR BRAKE

Removing all air from the rear brake line is the same as for the front. The rear brake reservoir is usually located beneath one of the side covers.

- 1) Remove the master cylinder cap and fill to near full.
- 2) Attach the pump hose to the bleeder fitting and pump the handle several times to create a vacuum.
- 3) Crack the bleeder with a box wrench. Because of the short line, most of the air should be evacuated the first time.
- 4) By closing the valve and repeating the process, all of the air should be eliminated from the system. Stop and add more fluid when master cylinder gets low.
- 5) Top off and recap the reservoir.

TROUBLESHOOTING

- 1) If, after bleeding procedure, the brake continues to be unresponsive, you may have water in the system, in which case it will need to be disassembled and cleaned by a qualified service technician.
- 2) If the brake squeaks slightly after bleeding, the disc and pads must be cleaned.
- 3) Although DOT 3 fluid is recommended by most manufacturers, it has a tendency to collect moisture, which causes the common discoloration you see - and that means decreased efficiency. DOT 5 is silicone based and does not have the same tendency to collect moisture. It also has a higher tolerance. DOT 5, however, is not always easy to find and the two types of fluid must not be mixed.
- 4) Rubber hoses are supplied stock on most motorcycles, but they have a tendency to expand, which may result in a spongy brake feel after a lot of riding. Braided steel line will not expand like this.

BRAKE BLEEDING

BENCH BLEEDING THE MASTER CYLINDER

Whenever a master cylinder has been removed from a vehicle or a new one is being installed, the master cylinder must be bench bled. Failure to bench bleed is the main reason for unsuccessful master cylinder replacement. Bench bleeding greatly decreases the chance that any air will be caught in the cylinder upon reinstallation. Follow this procedure:

- 1) Plug outlet holes of the master cylinder and gently clamp it in a vise with the push rod end slightly elevated. NOTE: Damage may result if master cylinder is clamped by the bore or if reservoirs are clamped too tightly.
- 2) Fill the master cylinder with an approved type brake fluid and keep it filled at all times during the procedures.
- 3) Remove a plug from the master cylinder and attach the proper adapter to this master cylinder outlet port. Connect the pump tube to the reservoir jar and the jar tube to the adapter (FIGURE 2).

- 4) Operate the pump and observe air and fluid flowing into the reservoir until clear, bubble-free fluid appears.
- 5) Plug the outlet tightly and repeat step 4 on the other outlet ports.
- 6) Clamp master cylinder in a vise with the push rod end down slightly. Slowly slide the master cylinder push rod back and forth about $\frac{1}{8}$ ", until no air bubbles can be seen in the reservoirs.
- 7) Remount the master cylinder with the push rod end up and follow steps 3 & 4 on all outlet ports. Plug ports tightly. The master cylinder is now free of air and ready to install.

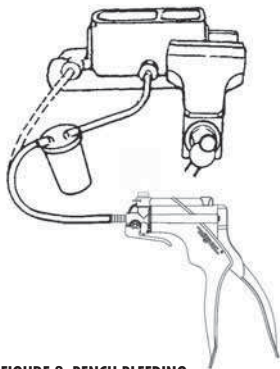


FIGURE 2: BENCH BLEEDING