

T.M.

MATCO

DIAPHRAGM BRAKE BLEEDER

No. BB100D

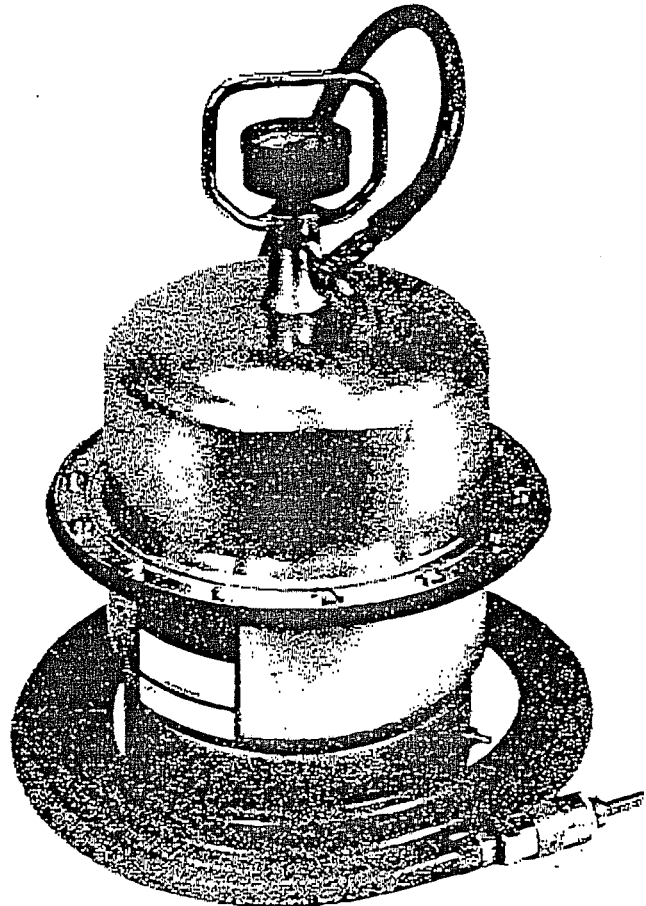
OPERATION & MAINTENANCE MANUAL WITH PARTS LISTINGS

BLEEDS -

- CLUTCH SYSTEMS
- TANDEM SAFETY MASTER CYLINDERS
- DUAL CLUTCH AND BRAKE CYLINDERS
- POWER BRAKE SYSTEMS
- ANY MASTER CYLINDER WITH OR WITHOUT A CHECK VALVE
(INCLUDING CHECK VALVE WITH SMALL HOLE)

FEDERAL LAW

requires the user of this tank to fill in the brand name and fluid type (DOT No.) of brake fluid where indicated on label.



WARNING!

1/2 of 1% of water in system will drop boiling point 20° to 90° F depending on boiling point range of fluid. Always keep all containers of brake fluid tightly sealed. Chemicals in fluid absorb moisture



MATCO TOOLS CORP.
124 West Ave.
Tallmadge, OH 44278

Form No. E-1142
Jan. 1985

ADAPTERS AND ACCESSORIES INCLUDED WITH THE DIAPHRAGM BRAKE BLEEDER

BB100D Diaphragm Brake Bleeder, 1.0 gallon capacity. Includes:

BB107 Universal Domestic Car Brake Bleeder Adapter, for single and dual master cylinders. Includes plate, 1/8" male NPT quick disconnect hydraulic nipple 12-120, single reservoir gasket 99-419, dual reservoir gasket 99-420, clamp assembly 99-430.

12-116 — Fluid Nozzle

99-400 — Pressure Gauge

99-415 — Hose Assembly, 11-foot length.

99-450 — Diaphragm, not shown.

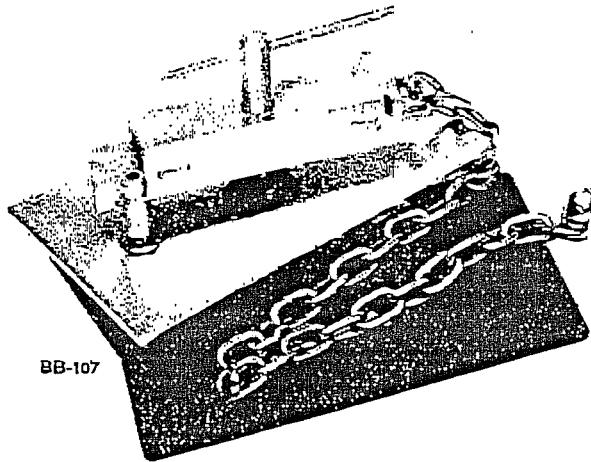
99-451 — Tank Assembly, less diaphragm, not shown.

99-455 — O-Ring, 11/16" I.D.

99-459 — Shut-Off Valve, with screen.

99-460-01 — Safety Pop-Off Valve

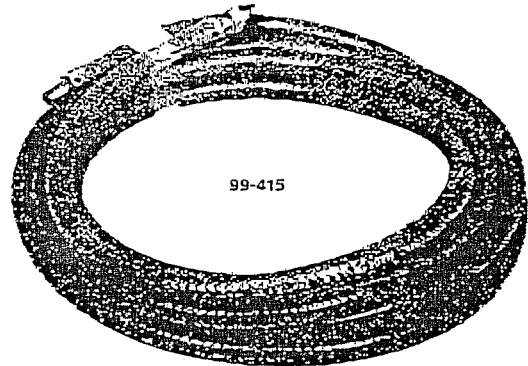
99-461 — Coupler, 1/4" — 18 NPT female quick disconnect. **NOTE:** Will not fit Professional Brake Bleeder 70-022.



BB-107



99-400



99-415



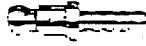
99-459



99-455



99-461



12-116



99-460-01

COMPLETE LISTING OF: BRAKE BLEEDERS, ADAPTERS SHOWING APPLICATION, AND SERVICE PARTS BREAKDOWN

NOTE: All parts listed may also be ordered separately.

BRAKE BLEEDERS

BB100D — Diaphragm Brake Bleeder, one gallon capacity. Complete with adapters and accessories. See top of page for parts breakdown.

70-022 — Professional Diaphragm Brake Bleeder, 2.75 gallon capacity. Includes:

BB108 — Basic Domestic Car Brake Bleeder Adapter, for round tanks, 1-3/16" to 3-1/16" diameter openings.

BB109 — Basic Domestic Car Brake Bleeder Adapter, for tandem tank, 1-7/8" to 4-7/16" minimum up to 3-1/8" to 6" maximum.

99-464 — Nipple, 5/16" — 24 male thread adapters. **NOTE:** Will not fit MATCO adapters BB122 and BB107.

99-465 — Elbow Connector, 45° for all 5/16" — 24 thread adapters.

99-466 — Whip End Hose, 10" length fits all adapters with 5/16" — 24 thread.

99-478 — Adapter, combination screw type, 3/4" x 1 1/4" x 1-5/8" thread, for all makes of cars and trucks with threaded reservoirs

99-479 — Ball Point Filler

99-480 — Bleeder Hose, snap-on type.

99-481 — Bleeder Hose, screw-on type.

99-482 — Gaskets.

Other Diagonal Or Vertical Cylinders-Surge Bleeding

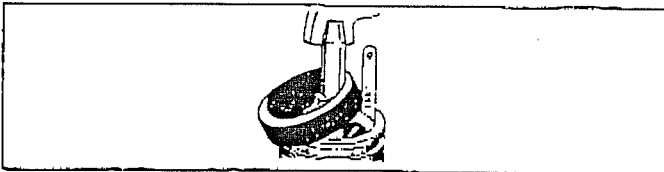
Volkswagen, Some Trucks, etc.

On such cylinders, the bleeder screw is not always the highest point to allow air to escape, therefore complete bleeding is difficult. Surge bleeding will help.

1. Bleed each wheel with pressure bleeder.
2. Open one bleeder screw at a time and have someone kick the brake pedal vigorously a few times. This will cause turbulence in the cylinder forcing additional air out of the cylinder.

Bleeding With The Use Of A Shim

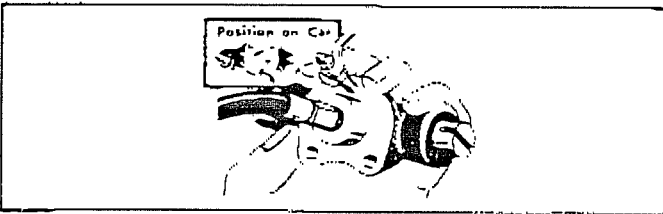
Another way to insure proper bleeding on such cylinders; as illustrated by, inserting a .002" feeler beyond the cup into the cylinder and permitting all air to bleed out.



Horizontal Bleeding - Volkswagen

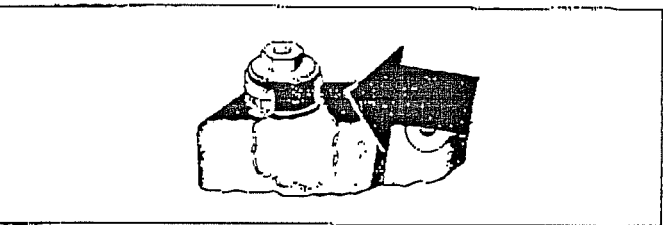
Bleeding cylinder in horizontal position with bleeder screw on top before attaching to backing plate also helps to get air out of cylinders.

(See Illustration)



Vertical Master Cylinder - Ford Tilt Cab

Remove Push Rod and Boot, insert 99-484 plug and secure by tightening the nut and expanding the rubber plug. Follow normal bleeding procedure.



Bendix Tandem Master Cylinders - 4 Hole Mount with 2 Screw Style Filler Covers

1. Since front and rear reservoirs are connected, all four wheels can be bled with one hook-up. (1962)
2. Remove vented filler plug. Attach adapter. Tighten other solid non-vented filler plug securely.

Moraine Tandem Master Cylinders - 2 Hole Mount with 2 Screw Style Filler Covers

The reserve tank in 1962-63 is split into two completely separate reservoirs; therefore, bleeder must be connected to each of the two inlets in two separate operations.

1. Remove front cap from reservoir and attach pressure bleeder with proper adapter and bleed rear wheels.

2. Reconnect bleeder to rear cap in reserve tank and proceed to bleed front wheels.
3. Remove pressure bleeder and check fluid level in both sides, bringing up to reservoir top. Replace reservoir caps.

Moraine and Bendix Tandem Cylinders - With Single Long Style Cover (Bolt or Bale type)

1. On 1962 and later models with open type reservoir, the BB109 adapter should be used. This adapter is designed to fill both sides of the tandem reservoir automatically. Both front and rear wheel cylinders may be bled with one hook-up of the adapter.
2. After removing adapter plate fill both sections of reservoir to reservoir top.

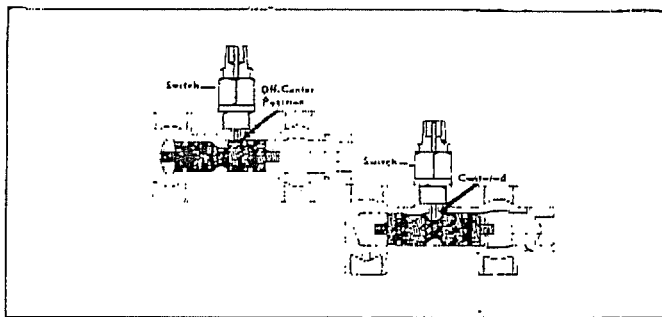
Dash Warning Light • Tandem Brake Systems

Since 1967 cars are equipped with a warning light operated by a pressure differential safety valve indicating loss of fluid pressure in one half (front or rear) of the system. The switch is usually located below the master cylinder. A "glowing" warning light on the dash indicates a failure which has created the unequal hydraulic pressures in the brake system.

After the system has been repaired and bled, the warning light will usually continue to glow because the valve remains in the off-center position. To recenter the valve it is necessary to relieve pressure in the half of the system which did not fail or has not been bled, but only to the point where the valve returns to the center position. Remember the bore and stroke of the switch are small and short. The person pressing pedal is key to the operation. Bleeding with pressure bleeder will not activate valve.

Ford Style Valve

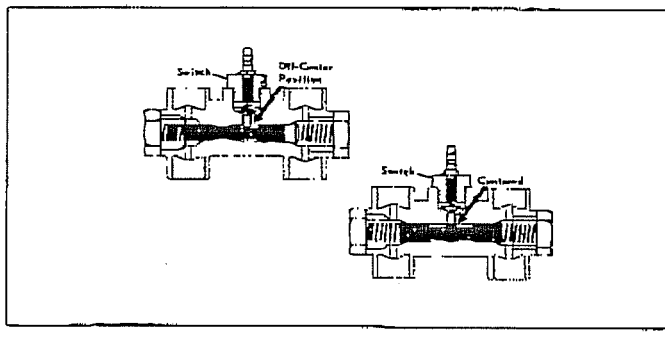
1. Turn ignition switch to On or Acc. position.
2. Loosen (do not disconnect) the brake tube at the master cylinder outlet port for the half of the system which did not fail or the half that was not bled.
3. Depress the brake pedal slowly until the light goes out; valve is then centered.
4. Immediately tighten the connection.
5. Should the light flash off and back on, the piston in the valve has moved to the opposite end and the procedure must be repeated on the other half of the system applying less pressure on the brake pedal.



American Motors Style Valve

1. Before any work is performed, remove the switch from the housing.
2. Depress the brake pedal slightly to enable removal of the plastic probe to prevent breakage.
3. After repairs have been made and the complete system pressure bled, reinstall the plastic probe and switch
4. Turn ignition switch to On or Acc. to check the valve for proper location of the plunger.

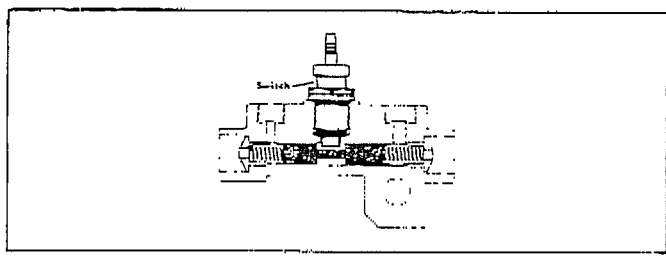
- 5. Bleeding with pressure bleeder will not activate valve since it does not supply sufficient pressure to center valve spool; use foot pedal only.



General Motors and Chrysler Style Valve

This valve is spring loaded on both ends. The light is activated only while the brake pedal is in an applied position. Switch is inactive when pressure is released. No re-centering procedure is required for this type of valve. Some switches have been found to have a rust build-up between the switch and body assembly causing a closed circuit. Clean off rust and reinstall. Many of these cars use the same bulb on the dash for the emergency brake. Light remaining "on" could mean problems in that area, emergency brake not fully released or a malfunctioning switch.

CAUTION: All switches; light is activated when starting engine. This is a test of the bulb only.



DISC BRAKE SYSTEMS

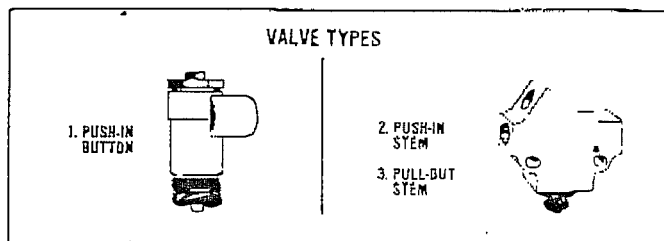
1. Same as conventional wheel cylinder systems: Master cylinder and power units with bleeder screws must be bled first. Bleed rear wheel cylinders: first right, then left.
2. Bleed front calipers.

The construction of some calipers result in fluid passageways, on external crossover lines being above the bleeder screws. Air will rise to top and remain trapped in the caliper or lines. In these

cases the caliper should be bled, disconnected from the steering knuckle if possible. This is done by rotating and rolling the caliper to insure that all air has been moved up to the bleeder screw chamber.

Metering Valve - For Vehicles with Disc Brake Installations

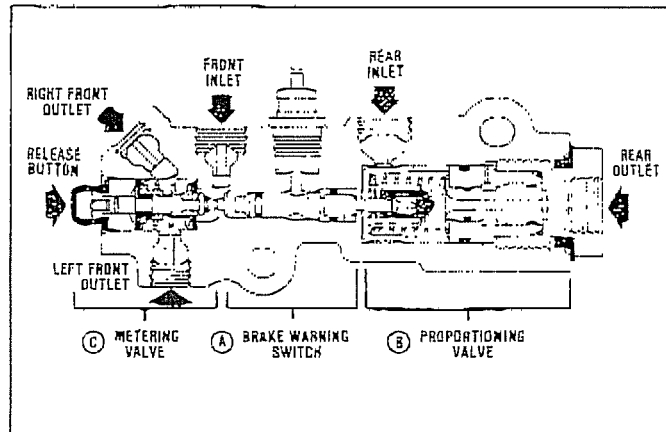
Metering valve must be in released position to achieve correct bleeding of front disc calipers. Three types of valves are used as illustrated. Use an assistant or a suitable clip to hold valve in released position while bleeding calipers. Be sure to remove clip upon completion.



Combination Valve: For Vehicles (since 1970) with Disc Brake Installations.

A combination valve consists of two or more valves in one body: (A) Brake Warning Switch (B) Proportioning Valve and/or (C) Metering Valve.

See instructions under Metering Valve to achieve correct bleeding of system. To recenter the brake warning switch after a failure and repair of same, apply brake pedal several times.



CAUTION • BEFORE PUTTING VEHICLE ON THE ROAD CHECK THE FOLLOWING:

- Always check all connections and units for leaks with heavy pedal pressure, before releasing vehicle for road. Recheck after road test.
- Check master cylinder after installing.
- Fill master cylinder with brake fluid to top of reserve tank.
- Always check by-pass port in master cylinder to be clear when system is at rest. Never probe small hole. When applying brakes there should be a ripple in the fluid in the reserve

tank. After applying brakes a few times there also should be a ripple caused by returning fluid. Checking visually with a bright light is also advisable.

- Warning! If by-pass port is not clear system will lock up and cause damage. On standard brakes always check for free pedal clearance (1/4" to 1/2"). On power brakes it is more difficult to check by-pass port opening.

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Bleeding Brake Systems Using Brake Bleeder Harness

CAUTION

Always cover fenders and keep hoses clean to avoid damaging car finish!

1. Clean top of master cylinder before opening in order to avoid dirt dropping into reservoir tank. Remove cover and gasket. Pour enough brake fluid into reservoir to cover master cylinder ports.

INSTALLATION PROCEDURE ON ALL DUAL MASTER CYLINDERS

2. Install adapter tubes into master cylinder ports and fasten down securely with rubber strap. Be sure rubber tips are seated into ports in bottom of reservoir. Connect bleeder tank hose to quick coupling nipple. Open bleeder tank valve slowly, checking for fluid leak on lines, hoses and at adapter tube to port connection. Adjust as necessary to insure against leaks. The Brake Harness must first be bled to remove air from harness lines, using the air valve on adapter tube. Depress air valve until brake fluid appears.

3. Bleed brakes on vehicle in the following order: master cylinder (some have bleeder screws), line bleeder screws, and finally wheel cylinders and calipers.

4. Attach bleeder hose 99-480 or 99-481 from Bleeder Tank Kit to each bleeder screw in turn and insert open end of hose into the bottom of clear container. End of hose should be submerged in fluid. Open bleeder screw to permit all air to escape. For a positive check, watch for air bubbles in fluid. When brake fluid flows clear without any sign of air bubbles, close bleeder screw and tighten securely. To remove most of the air quickly from the master cylinder, it is suggested that the left front wheel be bled first, then right rear, left rear, right front, then left front again. It is good practice to re-bleed the four calipers again to insure an air-free system.

5. Apply heavy pedal pressure and check for leaks at all line hose and cylinder connection that you have made on vehicle.

6. Turn off brake bleeder tank valve and disconnect bleeders, (be sure to cover quick-disconnect coupler with a cloth before detaching to avoid spilling fluid on car finish). Remove adapter from master cylinder. Be sure reservoir is filled to the top and carefully clean gasket and master cylinder cover before replacing to prevent brake fluid contamination. Always consult the appropriate shop manual for the vehicle being repaired.

7. On most late model cars, the brake pedal indication of an air-free system is difficult to gauge when the car is standing still. A light foot pressure should give an indication of pedal height and feel. To determine whether the brake system is working with engine running and foot on the brake pedal, allows the vehicle to creep forward a few feet. Apply pressure to the pedal and vehicle should respond with a firm pedal at a reasonable pedal height. **THIS MUST BE DONE PRIOR TO A FULL ROAD TEST. IF VEHICLE DOES NOT STOP, RE-BLEED AND/OR RE-CHECK THE SYSTEM.**

STEPPED OR VARIED HEIGHT MASTER CYLINDER ON GM AND OTHERS

This brake harness is equipped with a unique adjustable bracket to simplify installation on stepped master cylinders. Install the adjustable adapter tube (with longer bolt and two nuts) into shortest port. Place second tube into remaining port. Use adjustment screw to level out mounting bracket. Mounting bracket, when correctly adjusted should be parallel to centerline of master cylinder. Fasten harness down securely using rubber strap.

CAUTION

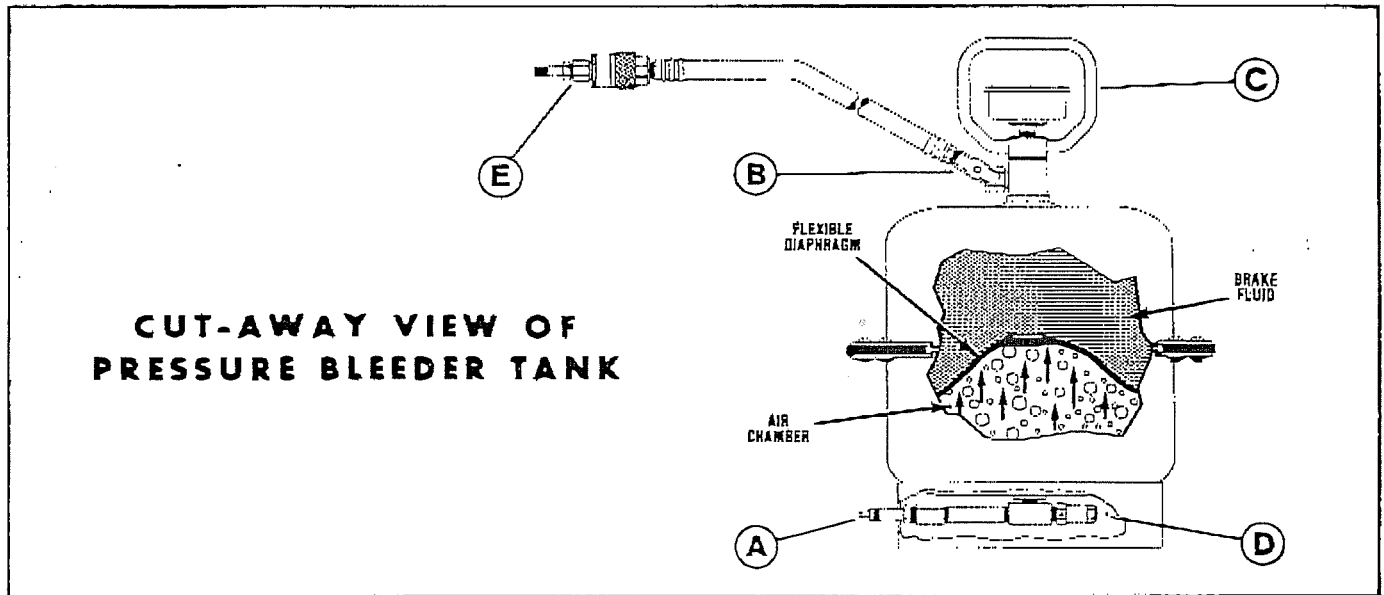
1. Always check all connections and units for leaks with heavy pedal pressure, before releasing vehicle for road test. Recheck after road test.
2. Check Master Cylinder for fluid level and pedal height after installing.



WARNING



To avoid serious eye injury, eye protection must be worn when using this too.



2. Close fluid shut-off valve "B"; remove manifold cap "C"; and fill with DOT type hydraulic brake fluid (Capacity one gallon).
3. Hand tighten manifold cap "C" to manifold; install valve core back into tank valve "A". Charge air through tank valve until gauge reads 20-30 PSI. NOTE: Safety pop-off valve "D" will release at about 30 PSI and reseat at about 25 PSI.
4. Install valve cap to tank valve.
5. On initial filling only, bleed air from tank. Install fluid nozzle "E" to coupler; place fluid nozzle into a suitable container; then slowly open shut-off valve "B" until fluid flows free of air bubbles.

BLEEDER IS NOW READY FOR OPERATION

Connecting Adapter Plate To Master Cylinder

1. Clean top of master cylinder to avoid dirt dropping into opening. Remove filler cap from the cylinder and clean gasket seat thoroughly. Fill master cylinder completely. On most adapters hand tightening is sufficient with clean surfaces and proper gasket. Others may require a wrench to tighten, in order to hold pressure.
2. Bleeding brake system with dual master cylinder reservoirs — use the large (4"x7") adapter plate gasket. Clamping mechanism must be placed on the counter-sink farthest from the nipple.
Bleeding brake systems with single master cylinder reservoirs — use the small (4"x5-13/16") adapter plate gasket. Clamping mechanism must be placed on the counter-sink next to the nipple.
Hand tightening of the clamping mechanism is all that is necessary.
3. Connect hose to adapter; then open shut-off valve. Check for leakage at all connections.
4. Proceed with bleeding as directed by the vehicle manufacturer (Recommended operating pressure of brake bleeder should be no more than 15-20 PSI.)

VEHICLE IS NOW READY FOR BLEEDING

BLEEDING

1. Check for leaks at all line, hose, and cylinder connections that you have made on vehicle.
2. Bleed units in the following order: Master cylinder (some have bleeder screws), booster or power units, line bleeder screws, all wheel cylinders, and finally, calipers.

3. Open screw to permit all air to escape. Watch air bubbles in fluid for a positive check. When fluid flows clear without any sign of air bubbles, close bleeder screw and tighten securely. To remove most of the air from the master cylinder quickly, it is suggested that the left front wheel cylinder be bled first, then right rear, left rear, right front then left front again. It is good practice to re-bleed the four wheels again to insure a perfect air-free system.

NOTE: The use of a glass container is recommended to catch brake fluid from bleeder screw during bleeding. Bleeder hoses (Matco 99-480 or 99-481) are available for those inaccessible bleeder screw locations.

4. To disconnect bleeder, always cover quick disconnect with a cloth before disconnecting to avoid fluid spill on car finish. Just uncouple quick disconnect, then remove adapter from cylinder, be sure reservoir is filled to top, and replace gasket and filler cap.
CAUTION: Always cover fenders and keep hose clean to avoid damaging car finish.

Power Brakes

1. Follow procedure above, except DO NOT bleed with the motor running, and exhaust all vacuum.
2. If power unit has a bleeder screw, bleed first. Some have two; bleed at highest screw first.
3. When bleeding treadle-vacs, use low pressure 10-12 lbs. in bleeder tank.
4. When bleeding hydro-vac, double stage control valve (Studebaker, Cadillac, etc.) re-bleed highest bleeder screw three or four times to insure complete air removal.

Clutch Systems

1. Follow normal bleeding procedures.
2. Clutch pedals will always go to floor, and will not build up same as a brake pedal, pumping will not help.

Single End Wheel Cylinders— Two Per Wheel

1. Such cylinders with an internal cross connecting line should be pre-filled before installing. Connect cylinders with the cross line hand tightened on the bench and prefill the cylinders; moving the pistons slightly will help to assure complete filling. Hoses and lines should be pressure bled before connecting the wheel cylinders. Re-bleed units after installing. Also note the following.

Domestic Car Brake Bleeder Adapters and Harness

BB107 — Universal Adapter, for single and dual master cylinder reservoirs with sheet metal caps. Maximum dimension 4" x 7" in length.

BB108 — Basic Adapter, for 1962-77 passenger cars, with round tanks. Diameter openings of 1-3/16" to 3-1/16."

BB109 — Basic Adapter, for passenger cars and light trucks, model years up to 1977, with a tandem tank. Minimum 1-7/8" x 4-7/16" up to a maximum of 3-1/8" x 6" (Also use as Foreign Car Adapter. See below.)

BB113 — Harness, for GM and Chrysler passenger cars, from 1978 to 1980, with tandem plastic reservoirs.

Foreign Car Brake Bleeder Adapters

BB109 — For Chevette and foreign passenger cars with a tandem tank. **NOTE:** Must be ordered with one gasket 99-463. Minimum of 1" x 3" to maximum 3-1/8" x 5-7/8" openings. (Also use as Domestic Car Adapter. See above.)

BB120 — For foreign passenger cars with 1" can thread. Requires one MATCO nipple 99-464 when used with MATCO Brake Bleeder BB100D.

BB121 — For the following foreign models with 1-3/4" can thread: Capri (1971-72), Fiat (1969-77), Mercedes and Renault (1967-68), Opel GT and Model 31W/1900 engine (1964-71), Saab Model 99 (1969-72), Volkswagen Transporter (1967-68). Requires one MATCO nipple 99-464 when used with MATCO Brake Bleeder BB100D.

BB122 — For Volkswagen passenger cars with 1-3/16" can thread, from 1967-76 with TRU-FLATE design nipple 12-120.

BB123 — For the following foreign passenger cars, with 1-1/16" can thread: Fiat and Saab (1967-68), MGB (1975-77), Volkswagen cars (1963-66), Volkswagen Thing (1973-74), Volvo (1967-76). Requires one MATCO nipple 99-464 when used with MATCO Brake Bleeder BB100D.

BB138 — Bayonet Style, for passenger cars like Fiat, etc. Requires one MATCO nipple 99-464 when used with MATCO Brake Bleeder BB100D.

BB139 — For Volkswagen passenger cars and trucks, from 1977-80, not listed above. Requires one MATCO nipple 99-464 when used with MATCO Brake Bleeder BB100D.

SERVICE PARTS AND ACCESSORIES

12-116 — Fluid Nozzle, for BB100D

12-120 — Nipple, TRU-FLATE design, 1/8" male NPT for BB122, BB107, BB100D.

99-400 — Pressure Gauge, for BB100D.

99-415 — Hose Assembly, 11-foot length, for BB100D.

99-419 — Single Reservoir Gasket, for BB107, BB100D

99-420 — Dual Reservoir Gasket, for BB107, BB100D.

99-430 — Clamp Assembly, for BB107, BB100D.

99-450 — Diaphragm, for BB100D.

99-451 — Tank Assembly, less diaphragm, for BB100D.

99-455 — O-ring, 11/16" I.D., for BB100D.

99-459 — Shut-Off Valve, with screen, for BB100D.

99-460-01 — Safety Pop-Off Valve, for BB100D.

99-461 — Coupler, 1/4" — 18 NPT female quick disconnect for BB100D. **NOTE:** Will not fit Professional Brake Bleeder 70-022.

99-463 — Gasket, for adapting the BB109 to foreign applications.

99-464 — Nipple, 5/16" — 24 male thread, for 99-466, 70-022.

NOTE: Will not fit MATCO adapter BB107.

99-465 — Elbow Connector, 45° for all 5/16" — 24 thread, for all adapters with 5/16" — 24 thread.

99-466 — Whip End Hose, 10" length, with one 5/16" — 24 thread male end and one 5/16" — 24 thread female end, for all adapters with 5/16" — 24 thread.

99-467 — Gasket, for BB108.

99-468 — Gasket, for BB109.

99-474 — Gasket, for BB113.

99-475 — Rubber Strap, for BB113.

99-476 — O-ring, 9/16" I.D. for BB113.

99-477 — O-ring, 7/16" I.D., for BB113.

99-478 — Adapter, combination screw type, 3/4" x 1-1/4" x 1-5/8" thread. Requires one MATCO nipple 99-464 when used with MATCO Brake Bleeder BB100D.

99-479 — Ball Point Filler, for BB100D.

99-480 — Bleeder Hose, snap-on type.

99-481 — Bleeder Hose, screw-on type.

99-483 — Adapter, for GM X-body model cars, for BB113

MAXIMUM OPERATING PRESSURE, 30 PSI

NOTICE

Protect car finish from fluid drippings — they will damage paint surfaces, etc.

MAINTENANCE

1. Keep bleeder tank and fittings clean at all times. Do not permit tank and fittings to come into contact with mineral oil products such as kerosene, gasoline, motor oil, thinners etc. Do not use water to wash out tank at any time. Never reuse fluid that has been bled through the brake system.
2. Thoroughly dry (inside and out) fittings cleaned in any medium other than brake fluid before use.
3. Clean air chamber out periodically to remove any water, oil and dirt sludge that may have been introduced from the air system used to fill the tank. Remove safety valve; clean and flush the air chamber and safety valve with alcohol and drain thoroughly.
4. Fluid chamber needs no attention unless dirt or improper fluid may have to be removed. Rinse with clean alcohol. Be sure to drain and dry completely to avoid contaminating next fill of fluid.
5. The safety valve on the bottom of the tank is set to blow off at about 30 lbs. It will reset itself at about 25 lbs. Never tamper with the safety valve except to check blow off. (See step 3, above).

ALL RUBBER COMPONENTS IN THIS UNIT ARE DESIGNED FOR USE WITH DOT TYPE HYDRAULIC BRAKE FLUID ONLY (NON MINERAL OIL TYPE).

DO NOT DISASSEMBLE THIS VALVE IF VALVE BECOMES INOPERABLE DUE TO FOREIGN MATTER, REPLACE IT WITH SAFETY VALVE 99-460.

FILLING

WARNING! Do not use aircraft brake fluid in this brake bleeder. Damage to diaphragm will result.

1. TO FILL UNIT — Remove valve core from tank valve "A" by using valve cap. This must be done before filling unit (Failure to do so will not allow diaphragm to invert to normal "full" position while filling, resulting in an overflow.) **DO NOT FORCE DIAPHRAGM DOWN WITH SHARP OBJECT! YOU MAY PUNCTURE THE DIAPHRAGM.**