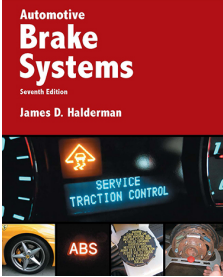


Automotive Brake Systems



CHAPTER 08

Brake Bleeding Methods and Procedures

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OBJECTIVES

- Discuss the various methods of loosening the brake bleeder valve.
- Discuss the need for brake bleeding.
- Describe the manual bleeding procedure.
- Discuss how to gravity bleed the hydraulic brake system.

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OBJECTIVES

- Discuss how to pressure bleed the hydraulic brake system.
- Describe how to service the hydraulic ABS and flush brake fluid.

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BRAKE BLEEDING

- Brake bleeding is removing any trapped air from the hydraulic system.
- If air is in the brake hydraulic system, the brake pedal will often feel “spongy”.
- The brake pedal will also travel further (lower than normal brake pedal) before the brakes start to apply.

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HIT AND TAP METHOD

- STEP 1 Tap on the end of the bleeder valve with a steel hammer.
- STEP 2 Using a 6-point wrench or socket, tap the bleeder valve in the clockwise direction.

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HIT AND TAP METHOD

- STEP 3 Using the same 6-point socket or wrench, tap the bleeder valve counter-clockwise to loosen and remove the bleeder valve.
- STEP 4 If the valve is still stuck (frozen), repeat Step 1 through Step 3.

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BRAKE BLEEDER VALVE LOOSENING METHODS

- Air Punch Method
 - Apply penetrating oil
 - Use air punch near bleeder valve
 - Simultaneously, try to loosen valve

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WAX METHOD

- STEP 1 Heat the bleeder valve itself with a torch. The heat causes the valve itself to expand.
- STEP 2 Remove heat from the bleeder valve.
- STEP 3 Allow the bleeder valve to cool until it can be safely touched with your hand.

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MANUAL BLEEDING

- STEP 1 Discharge the vacuum or hydraulic power booster (if equipped) by pumping the brake pedal with the ignition OFF until the pedal feels hard.
- STEP 2 Fill the master cylinder reservoir with new brake fluid and make sure it remains at least half full throughout the bleeding procedure.

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MANUAL BLEEDING

- STEP 3 Attach the plastic hose over the bleeder screw of the first wheel cylinder or caliper in the bleeding sequence, and submerge the end of the tube in the jar of brake fluid.
- STEP 4 Loosen the bleeder screw approximately one-half turn, and have an assistant slowly depress the brake pedal.

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MANUAL BLEEDING

- STEP 5 Tighten the bleeder screw, then have your assistant slowly release the brake pedal.
- STEP 6 Wait at least 15 seconds to allow time for any small bubbles to form into larger bubbles. See the Tech Tip called, "Tiny Bubbles."

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MANUAL BLEEDING

- STEP 7 Repeat steps 4 and 5 until no more air bubbles emerge from the bleeder.
- STEP 8 Transfer the plastic hose to the bleeder screw of the next wheel cylinder or caliper in the bleeding sequence, and repeat steps 4 through 7.

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GRAVITY BLEEDING

- STEP 1 Fill the master cylinder reservoir with new brake fluid.
- STEP 2 Attach a length of plastic tubing to each bleeder screw, and place the ends of the tubes in jars to catch the drainage.
- STEP 3 Close the bleeder screws and top up the fluid level in the master cylinder reservoir.

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PRESSURE BLEEDING PROCEDURE

- STEP 1 Consult the equipment manufacturer's instructions and fill the pressure bleeder with the proper type of brake fluid.
- STEP 2 Make sure the bleeder is properly sealed and the fluid supply valve is closed
- STEP 3 If the vehicle is equipped with a metering valve, override it with the appropriate tool.

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PRESSURE BLEEDING PROCEDURE

- STEP 4 Clean the top of the master cylinder, then remove the master cylinder cover and clean around the gasket surface.
- STEP 5 Fill the reservoir about half full with new brake fluid, then install the proper pressure bleeder adapter on the master cylinder.

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PRESSURE BLEEDING PROCEDURE

- STEP 6 Connect the pressure bleeder fluid supply hose to the adapter, making sure the hose fitting is securely engaged.
- STEP 7 Open the fluid supply valve on the pressure bleeder to allow pressurized brake fluid to enter the system.

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PRESSURE BLEEDING PROCEDURE

- STEP 8 Slip the plastic hose over the bleeder screw of the first wheel cylinder or caliper to be bled, and submerge the end of the tube in the jar of brake fluid.
- STEP 9 Open the bleeder screw approximately one-half turn, and let the fluid run until air bubbles no longer emerge from the tube. Close the bleeder screw.

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PRESSURE BLEEDING PROCEDURE

- STEP 10 Transfer the plastic hose to the bleeder screw of the next wheel cylinder or caliper in the bleeding sequence, and repeat steps 8 and 9.
- STEP 11 Remove the metering valve override tool.
- STEP 12 Close the fluid supply valve on the pressure bleeder.

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PRESSURE BLEEDING PROCEDURE

- STEP 13 Wrap the end of the fluid supply hose in a shop towel, and disconnect it from the master cylinder adapter.
- STEP 14 Remove the master cylinder adapter, adjust the fluid level to the full point, and install the fluid reservoir cover.

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HYDRAULIC ABS SERVICE

- STEP 1: Check service information for specific procedure.
- STEP 2: Use factory scan tool or one capable of performing automated bleed procedure.
- STEP 3: Connect scan tool to data link connector (DLC).
- STEP 4: Enter vehicle information shown on display.

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HYDRAULIC ABS SERVICE

- STEP 5: Select ABS automated bleed from ABS menu.

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BRAKE FLUID REPLACEMENT/ FLUSHING

- STEP 1: Using turkey baster, remove old brake fluid from master cylinder reservoir.
- STEP 2: Fill master cylinder reservoir with new brake fluid.
- STEP 3: Slip plastic hose over bleeder screw of wheel cylinder to be bled.
- STEP 4: Open bleeder screw approximately one-half turn.

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BRAKE FLUID REPLACEMENT/ FLUSHING

- STEP 5: With bleeder screw open, have assistant slowly depress brake pedal.
- STEP 6: While assistant holds down brake pedal, close bleeder screw.
- STEP 7: Continue to bleed each wheel until fluid from bleeder screw is free of discoloration and contamination.

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BRAKE FLUID REPLACEMENT/ FLUSHING

- STEP 8: Repeat steps 4 through 7 at each bleeder screw in recommended sequence.
- STEP 9: Check brakes for proper operation.

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SUMMARY

- Brake bleeding is removing any trapped air from the hydraulic system.
- The procedures for manual bleeding, gravity bleeding, pressure bleeding, scan tool bleeding, and flushing are discussed.

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