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p a s s a t

[home](#) | [passat](#) | [maintenance & repair](#) | Brake & Clutch Fluid Flush

[photos](#)
[passat](#)
[mp3 server](#)

Brake & Clutch Fluid Flush

Flushing out brake fluid is a simple, straightforward job that should be done every two years (take a look at the links towards the end of the page for more info). Volkswagen didn't find a way to make this procedure (much) different on the Passat than other makes, so many of the guides available on the net are useful. This procedure includes the oft-neglected clutch slave cylinder, which shares fluid from the brake reservoir. If you're not sure that you want to flush out the slave cylinder (it's easy), take a look at the fluid comparison. The slave cylinder fluid was an eerie dark green - it actually looked like fresh power steering fluid! However, color isn't everything - the fluid also carried dark particles, presumably fallout from wearing seal material. ([illustration](#))

The procedure here is designed to be done by one person, by installing SpeedBleeders. This vastly reduces the time it takes to flush out the old fluid, and keeps the people in your life from being forced to listen to your orders for an hour. SpeedBleeders (bleeder screws with check valves) prevent backflow automatically, and are available at most auto parts stores for \$10USD/pair. The Passat bleeder screws (both front and rear) are size M10x1.0. Check the additional resources links at the bottom of the page for links to the classical two-person flush procedure if you're in a bind and can't get ahold of these. Pressure bleeding is also an option, but it's not uncommon to have a seal slightly loose or overpressurize the system and have brake fluid spew everywhere. Paint and brake fluid don't get along.

One additional tool is handy to have around - a wet/dry vac. Coleman makes a small (1 gallon) wet/dry designed to run off of a 12v supply, available for \$15-\$30. It comes with a useful assortment of attachments and I've used it to deal with the interior as well as brake fluid, power steering fluid, and water drains. It can also be used to vacuum bleed the brake lines, but using the brake pedal with SpeedBleeders is much quicker. ([illustration](#))

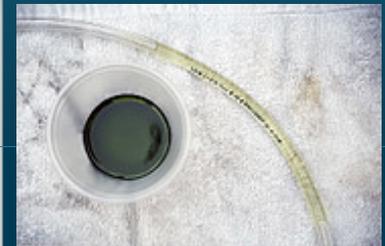
Part Information & Sources

- 1.5 quarts brake fluid - Valvoline DOT 4, \$5/quart (only 1 quart for the automatic transmission)
- 4 check-valve bleeder screws (SpeedBleeders) - Motormite HELP! #12706, \$10/pair (Pep Boys)
- Brake cleaner
- 6ft. aquarium airline tubing*
- 3ft. 1/4" ID clear vinyl tubing

* Only needed if using a vacuum pump or wet/dry vac to extract fluid from the drain ports on 2000+ models

Tools needed:

- Socket: 19mm
- Box-end/combination wrenches: 9mm*, 11mm, 3/8"
- Torque wrench: capable up to 90 ft-lbs
- Any of the following or similar: wet/dry vac, suction fluid pump, turkey baster



- Flashlight*

* Only needed for the manual transmission. Check that you have the 9mm - some wrench sets do not include it.

Draining the reservoir:

- 1998-1999 models:
 - Use a turkey baster (the gold standard for shadetree mechanics), vacuum pump, or some other ingenious contraption to get fluid out of the reservoir.
- 2000+ models:
 - On 2000 and later models, VW added two drain ports to get most of the fluid out of reservoir. Use a flat-head screwdriver to remove the yellow cover sealing the ports. Attach the airline tubing to the rear port (closer to the cabin), and attach the other end to a suction pump, wet/dry vac, etc. Start suction - after the line stops drawing fluid (as indicated by air bubbles), switch to the front port and repeat. [\(illustration\)](#)
- Once the reservoir is empty, refill with new brake fluid. If you have an automatic transmission, skip to step 12 below.

Flushing the clutch slave cylinder:

- Remove the three screws securing the coolant tank and disconnect the coolant level sender connector from the bottom of the tank. Pull the tank up and angle it towards the front of the engine - the coolant hoses have enough slack to let the tank stay out of the way. [\(illustration\)](#)
- Use a light to look into the cavity where the tank normally lives - looking in, you should see the clutch slave cylinder's bleeder screw with a black rubber dust cap. [\(illustration\)](#)
- Pull off the dust cap (keep it somewhere safe) and attach the 1/4" ID clear vinyl tubing to the bleeder screw. Lay the tubing such that the fluid will rise above the level of the bleeder screw before it can drain down to the vacuum source (a half loop) - this will prevent air from entering the slave cylinder when you stop suctioning. [\(illustration\)](#)
- Connect the tubing to your suction source.
- Use a 9mm open end wrench to open the bleeder screw - turn the screw (carefully) counterclockwise until fluid starts to drain from the slave cylinder. It's important to use a real 9mm wrench - the bleeder screw is plastic (strange place to cheap out on a part), so using a close SAE wrench will just result in rounding off the edges. Ask me how I know. As a bonus, the bleeder screw is **not** available as an individual part.
- Flush until the fluid looks new - Valvoline DOT4 is useful, as it is nearly transparent when new and easy to recognize once flushing is complete. Keep the brake fluid reservoir topped off while this is going - the fluid shouldn't be allowed to drop below the "min" line. I extracted 250ml (~8 oz) before the fluid ran clear.
- When done, check the tubing to make sure that the bleeder screw is completely submerged in fluid. Close the bleeder screw (with tubing still attached) once the fluid has been replaced - because the screw is plastic, take care not to overtighten. You will not need a torque wrench, but the spec is to tighten to only **3 ft-lbs / 4 N-m**. At that level, just the weight of your arm could tighten the screw to spec.
- Pull off the tubing, clean up and replace the dust cap.
- Reattach the coolant level sender connector to the coolant tank, and place it back into position. Reinstall and tighten the three mounting screws.

Alternative flushing method (without a vacuum source):

- This is conceptually the same as the classic two-person brake bleed method. Call out somebody who's willing to help. Have your helper hold down the clutch pedal completely - once it's down, open up the bleeder screw for a few seconds and let the fluid spurt out. Close the screw. The clutch pedal will be stuck on the floor, as there is no backpressure to bring it up. Have your helper use the tip of their foot to bring the pedal back up slowly (or grab it by hand). It's important to bring it up slowly, as the slave cylinder is drawing fluid from the brake reservoir while you do this. Too fast, and you'll be putting stress on the seals - like sticking a syringe in fluid and then suddenly yanking on the plunger. Repeat about 20 times or until the fluid runs clear. It's tedious, so thank your helper profusely. I recommend using [Newcastle](#) or [Chimay](#) (might be not be a great idea if you're using child labor).



SpeedBleeder installation and flushing:

12. The Passat is flushed in the standard order: RR wheel, LR, RF, LF. The wheels should be removed for easy access to the calipers. Start by loosening the wheel lug nuts while the car is on the ground, then completely remove the wheel after the car is up on a jack stand. ([illustration](#))
13. Use brake cleaner around the bleeder screw to ensure that dirt doesn't enter the caliper when you pull the screw.
14. Pull off the dust cap and use the 11mm wrench to open and remove the old bleeder screw. ([illustration](#))
15. Install the new bleeder screw with the 3/8" wrench - it should be tightened gently until snug, at which point the brake line is sealed. ([illustration](#))
16. Attach the 1/4" tubing to the bleeder screw, and open the bleeder screw 1/4 turn. Brake fluid should start flowing out. ([illustration](#))
17. The fun part - hop in the cabin and pump the brake pedal repeatedly until the fluid runs clear. Keep the fluid reservoir topped off while you do this. Pump the pedal only as far as you normally do during braking, not all the way to the floor. The issue here is that the pedal usually never goes all the way to the floor, so the seals in the master cylinder only move along a short range. If the pedal is put to the floor, the seals enter a part of the cylinder that hasn't seen use in some time and may have corrosion on the walls that can damage the seals. This is more of a problem with cars that have seen a lot of years, but still something to keep in mind. ([illustration](#))
18. Tighten the bleeder screw to torque "snug" and go back and press on the brake pedal. If the pedal slowly sinks to the floor, tighten the bleeder a bit more. I tightened to **6 ft-lbs / 8 N-m**, but a torque wrench isn't necessary for this.
19. Reinstall the dust cap and put the wheel back on. Tighten the lug nuts by hand, lower the car, then finish tightening in a star pattern with a torque wrench set to **89 ft-lbs / 120 N-m**. A torque wrench **is** important here, as uneven torque across the lug nuts is often responsible for warping the brake rotors.
20. Move on and complete the other wheels in the RR->LR->RF->LF order. The rear calipers each needed about 175-200ml of fluid, and the front calipers around half that amount. I actually managed to flush out the clutch and all four calipers with 1 quart of fluid, but the fluid ended up slightly under the max fill line. So, it's a good idea to have 1.5 quarts on hand.
21. When you're done with all four wheels, hop back in the cabin and press hard on the pedal - it should hold without dropping slowly to the floor. Don't drive the car if it does sink - check for leaks at one of the bleeder screws.

Done! Next time you need to bleed or flush out the system, you can just put up a corner on a jack stand and access the bleeder screw from under the car - you won't need to remove the wheels. So very easy.

Additional resources:

- [Brake & Front End Magazine - Brake Fluid Does Wear Out](#) (April 2001) - general information on brake fluid
- [Brake & Front End Magazine - Industry Adopts Brake Fluid Replacement Guidelines](#) (May 2004) - information on how brake fluid degrades over time

Comments:

- I tried this on my daughters 2000 Passat V6 and I gave up. I could not find the clutch bleeder valve. It is just too crowded in there. Any suggestions?
TIA
Dave
David, New Mexico USA - Dec 24, 2007 @ 11:20 am
- VW Specification calls for Super DOT 4 for the brake fluid on 2002- 2005 Passats. The obvious difference is the dry and wet boiling points of the fluid. There may be other differences. Buy a Motive Power Bleeder and not the speed bleeders. Much more efficient operation and more in line with the VW/Bentley maintenance practices.
Rasputin, USA - Nov 6, 2007 @ 11:11 am
- Where can I find speed bleeders for an 02 Passat V6? I can only find them for 90 - 97 Passats online. Thanks!
Chris - Nov 6, 2007 @ 9:34 am
- VERY nice page; good pics; just got a couple points to add.
I live in a place with bad winters and road salt corrosion. I always use a 6-point deep well socket to loosen bleed screws without stripping the hex corners. Then attach the hose & use the end wrench to open/close for bleeding. If the hex gets buggered up I dig out my miniature 6" pipe wrench (crude, but effective) to get the old screw out before replacing it. Absolute last resort is an easy-out (aka screw extractor). If you have to go this far to get the old one out, use a brake hose plier to clamp off the rubber hose. If you don't have the special tool a vice grip and (always) double folded piece of sheet rubber will clamp off the line without damaging the hose.
Mike K - Ohio USA - Feb 16, 2007 @ 5:14 pm
- Wow, everything looks so clean and free of rust on your car. Incomparable with the looks of my brake

calipers. You're lucky to live in a region where they don't put brine on the roads during wintertime.

Johan Labberté, Netherlands - May 26, 2006 @ 4:59 am

- Speedbleeders!! Wish I had heard of these before now! Are they a standard size? Bleeding my brakes will not be a PITA anymore when I get some of these!

Darren Haines UK - Mar 4, 2006 @ 4:31 pm

- Thanks for the info about the coolant tank and the plastic bleeder screw. I bled it the hard way, from underneath.

I think my cluch has lost a pressure plate spring. The pedal has to be right at the floor to release the clutch and it grabs really spongily as you lift off.

John Willden, Moncton, Canada - Feb 4, 2006 @ 10:28 am

- bravo !! very nice write up on the brake fluids flush, and also for clutch fluid replacement which i think is always forgotten

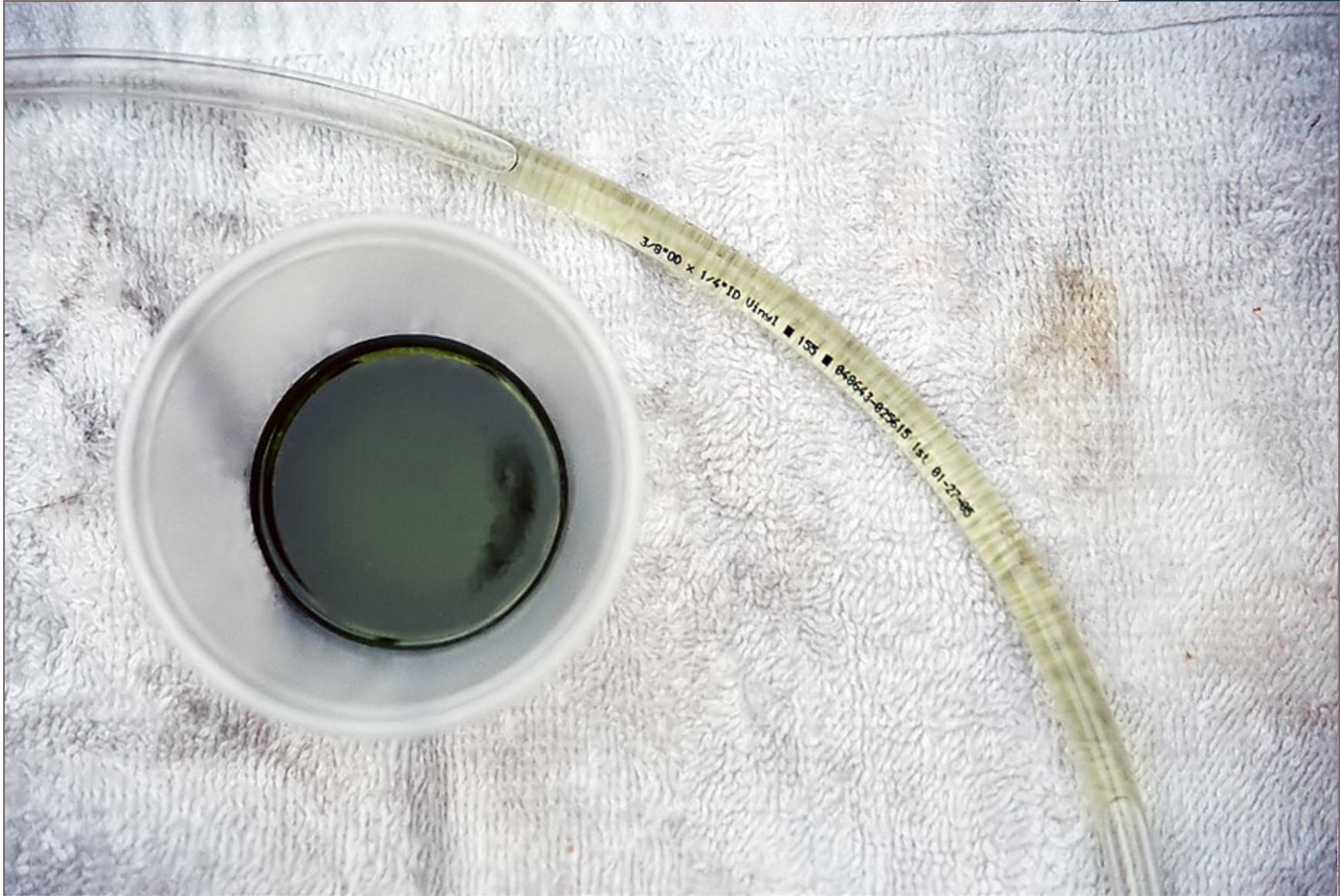
ANDREAS - ATHENS -GREECE - Nov 11, 2005 @ 8:46 am

Add a comment:

name (and country would be nice to see)

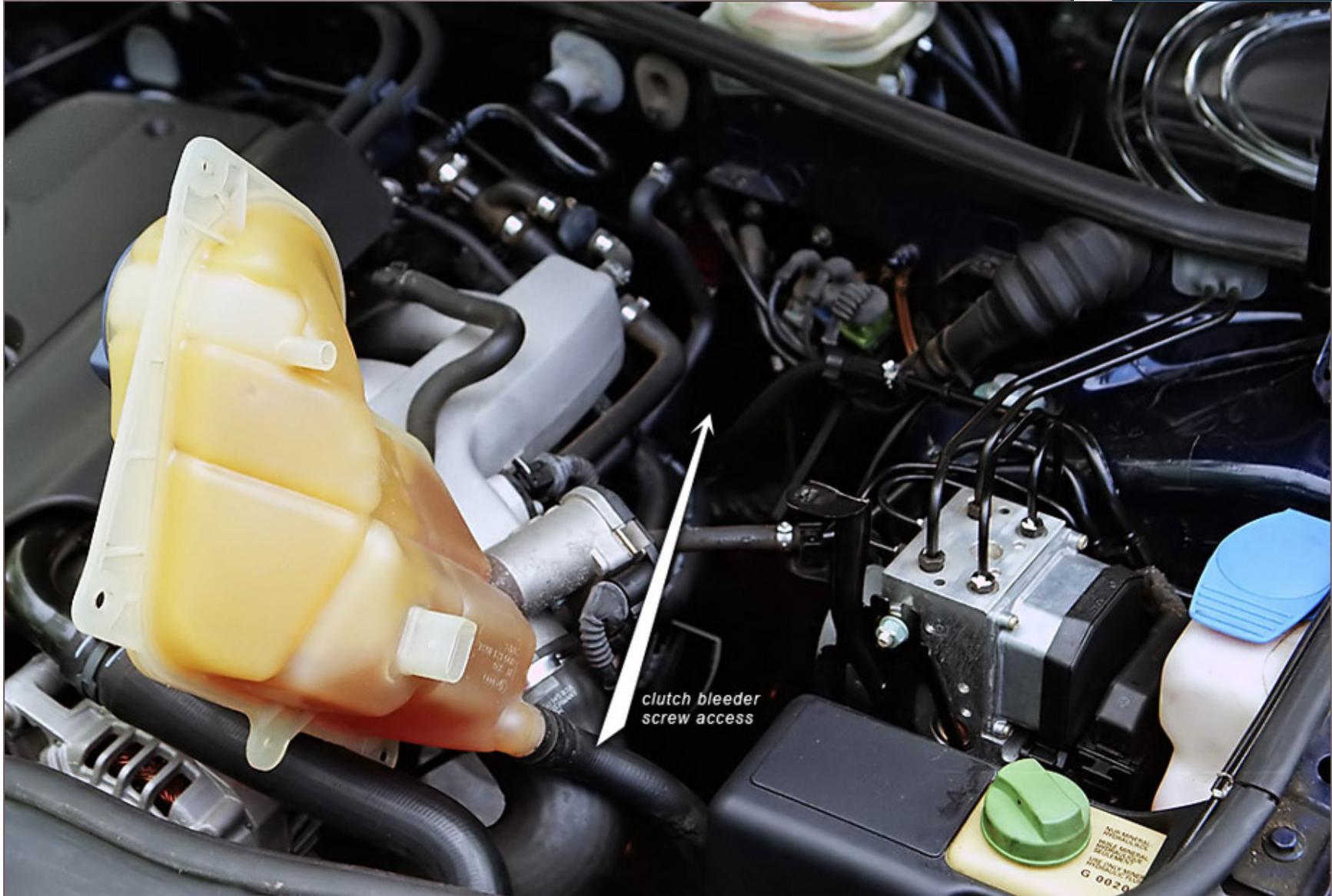
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clutch bleeder
screw access











