

Author: Jon Nelson on 2004-12-21

Brake Booster O-Ring Replacement

Prepare for the job, this repair will drop lots of fluid (brake fluid, Pentosin, and a bit of coolant) to the ground between the firewall and the left front tire. Put a large baking pan under the car at that point to catch the drippings. There are two parts to the job, one inside the car and one under the hood. Spend the first 45 minutes inside disconnecting things and getting your bearings, you will be clean and less likely to get grease on the carpet. Finally, at the end of the job you will need to bleed the brakes so make sure you have a helper and the room to bleed the brakes. Also, keep in mind that these specifications are for my 1992 850i 6-speed. The fittings are slightly different for other models, particularly the 840, which I believe has an additional fitting on the bottom of the booster unit. I think Ed covered that in an earlier post.

Tools/Parts:

I use mostly 1/4" drive tools at this point in my life because they are lighter and easier to use. Specialty tools: 7mm (for bleeding the brakes), 11mm, 14mm and 17mm flare wrenches. 17mm SnapOn 3/8" crowfoot flare wrench (part number FRHM17). 13mm, 1/4" drive, flexible joint socket (Sears part number 00943199000).

1 liter of Pentosin 7.1 or 11S (synthetic); whatever the reservoir cap indicates

1 can of brake fluid

Coolant (not much is lost).

NAPA O-ring part number BK 7272222

[http://www.napaonline.com/cgi-bin/ncommerce3/ExecMacro/NAPAOnline/search_results_product_detail.d2w/report?prfnbr=15618915&prmenbr=5806] or #222 at [<http://www.oringswest.com/>]

I also replaced the two grommets that seal the brake fluid reservoir to the master cylinder.

Procedure:

1) Set the wipers to vertical

2) Ignition off, pump brakes 15-20 times till hard to discharge system pressure.

3) Remove interior driver's side footwell trim, including 2 plastic screws near pedals (rotate 90 degrees); 2 plastic screws on under side of leather trim; 2 plastic screws on left foot rest; open hood and remove single screw in center of hood release lever on the left foot rest. Remove lever, foot rest, leather trim (careful, there is Velcro along the console, and three retaining pins along the top), and pedal cover. Your remote entry module may be attached to the top of the cover, if so, disconnect the electrical connector and set these parts aside. There is also a black air duct that is in the way. It is held in place with a single screw. Remove it and look at the brake pedal assembly.

4) Under hood: remove four screws that hold the cabin intake cowling cover in place, then the two screws that hold the cowling in place and remove the cowling. Next remove the plastic cover to the heater valve solenoids, the two electrical connectors to: a) the solenoids, and b) the auxiliary pump. The latter is on a flimsy plastic holder mounted to the firewall with a Phillips screw. Careful, don't break or lose this. There are two

brake regulator pressure switches with two contacts each. Remove the contacts and note where they go. Remove the three 'Acorn' nuts that hold the solenoid assembly in place. Gently lift this assembly and note that there are three hoses to the car, two on the front and one to the center fitting of the pump. Remove the clamps to these three hoses and using three fine wine corks reclamp the hoses. Not much coolant will be lost. Remove and set aside the solenoid assembly. Next, disconnect the brake fluid reservoir cover and using a turkey baster, remove all of the brake fluid. Remove the reservoir by gently rocking it back and forth (I had to pull pretty hard on mine). US spec 6-speeds have an extra blue hose off the back of the reservoir to supply hydraulic fluid to the clutch master cylinder. NEVER drip brake fluid on paint, it removes it. If you drip some on a painted surface, thoroughly wash down the spot immediately (I keep a wet rag handy because its hard not to drip). Now, step back and look at what is left, inside and outside the car. Rest for a bit. Outside there is the master cylinder and booster assembly about 18 inches long in total. Inside (using a good flashlight), you will see three 13mm nuts that hold the booster to the firewall and perhaps the fourth one on the upper left. That one is the most difficult to get at. This is where the 13mm flex wrench comes in. Also figure out the clip that holds the clevis pin in place on the brake pedal.

5) Take a look at what you need to do outside: there are two brake lines mounted to the side of the brake master cylinder (11mm) and one high pressure and one low pressure Pentosin lines mounted to the top of the brake booster (17mm). All of these need to be removed in order to get the assembly free. For me the most difficult one was the high pressure 17mm flare fitting on the booster. That is where I had to use the SnapOn crowfoot flare wrench with an 8" extension. Remove the 4 nuts inside and the fittings in the engine compartment and you can remove the assembly. There is also a plastic cable holder on the side of the master cylinder. Disconnect anything else that gets in the way. I used some hanger wires as retractors to pull hoses and cables out of the way.

Repair:

Keep everything very clean using clean towels and rags, this is your brake system. On work bench remove the two bolts that hold the master cylinder to the booster. Mine were held in place with Loctite so I had to use a flare wrench to remove them. There is a small ratcheting screw on the bottom front of the booster. With a rag to catch the oil and spring, remove this screw carefully. The spring has a lot of tension so be careful when you release the small screw. Keep track of the orientation of the inside parts. The offending O-ring is held in place by a big washer, so simply replace it with the one from NAPA, clean everything and reassemble. Putting the spring and cap assembly back in the booster is a bit tricky but the little retaining screw can be partly threaded in. Make sure that screw goes into the slot in the plastic cap and that the pushrod seats properly.

This is a perfect time to replace the spark plugs on bank 7-12. I did because it is the "only way to get to plugs 11 & 12." Take my advice and do this now, you will never regret it. 12 plugs at \$1.80 each.

Bleed the brakes after assembly and also the Pentosin system using the Pentosin bleeder valve on the bracket with the pressure regulator (850s only). Do this one with the 11mm and 14mm flare wrenches and the engine running. Very easy.

