

## Rebuilding Your M100 Rear Caliper—by Mark Alloy

With track season coming up, it was time to do something about the brake fluid that was accumulating on the inside of my rear wheel and on the garage floor. Rather than shell out \$300 - \$400 for a new caliper, I decided to rebuild it.

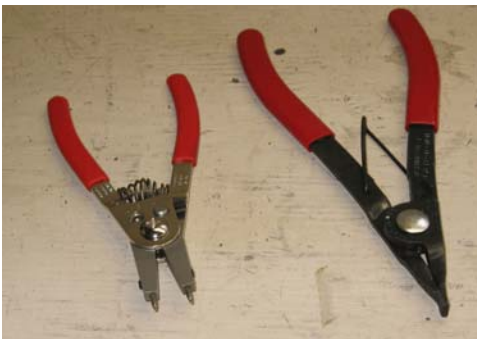


You mean that is why the rear brakes didn't work?

### Tools needed:

- 18mm socket and box wrench
- 14, 11, 10 mm wrenches
- Needle nose pliers
- Internal and external snap ring pliers – absolutely must have these!
- Denatured Alcohol
- Brake Fluid
- Rear Caliper rebuild kit including piston boot, seal, locator ring, retaining ring, check valve plastic button, silicon grease and washers.

This is one of those repairs that is next to impossible without the correct tools – in particular the snap ring pliers. You need both internal and external pliers – I spent about \$20 for both.



Internal snap ring pliers (smaller pair) are used to compress the retaining ring before removal and reinsertion into the piston cylinder. External snap ring pliers (larger pair) are used to expand the locator ring for insertion around the piston itself

One word of caution – brake fluid will be dripping and dribbling everywhere during this procedure – take extra care to avoid getting any on the car, as it will eat through the paint.

Jack up car and place jack stands under the rear jack points. Place a large catch basin and/or a plastic trash bag under the caliper to catch the brake fluid. After removing rear wheel, disconnect the brake line and plug it. Pull back on the parking brake arm and disconnect the cable. Remove the two bolts on the rear of the caliper, which hold it to the frame. You can remove one with the 18mm socket and the other with the wrench. Hold the caliper upside down over the catch basin and drain out the brake fluid.

Remove the brake pads and pad-retaining clip. It's a good time to put on new pads if they are worn. Remove the spring, bolt, and 2 washers holding on the parking brake arm.



Parking brake arm

There is a second bolt beneath the parking brake arm, which is the headbolt of the brake actuator that fits into the brake piston. Turn this bolt with a wrench and the piston will be forced out the front of the caliper. Be very careful to protect the piston as scratches can cause leaking after it is replaced. If the piston is already scratched or pitted, you are probably out of luck and will have to replace the caliper assembly.



Brake piston, actuator screw and return spring, after cleaning.

Pull off the piston boot. Don't worry about ripping it – a new one should be in the rebuild kit and will be fitted on. The boot has a metal retaining ring at the bottom, shown in the picture.



If the retaining ring doesn't come out when you pull off the boot, remove the retaining ring from the caliper cylinder with the needle nose pliers. This was one of the more frustrating steps, as the retaining ring had been pressed flush against the cylinder wall by years of pressure and was virtually indistinguishable from the cylinder wall.

Note that picture shows inside of caliper after cleaning.

Using the internal snap ring pliers, remove the retaining (circlip) ring. Then remove the piston locator ring, which is rattling around behind the circlip ring.

Finally, carefully remove the piston seal, taking care not to scratch the cylinder wall.

At this point, dump all the hardware (piston, actuator screw, spring, various washers) into denatured alcohol and clean everything very well. Then remove the bleed valve and banjo bolt from the caliper, and give all three an alcohol bath as well. The piston and caliper cylinder must be very smooth and shiny clean when done so that no abrasive material remains inside the caliper during reassembly.

Lubricate new seal with brake fluid and fit into groove in cylinder.

Next comes another step to challenge your fine motor skills – fitting the piston locator ring onto the piston. Lubricate both well with brake fluid. Using the external snap ring pliers, expand the ring wide enough to fit onto the rear of the piston.



Note cotton towel around piston to prevent bench vice from scratching it.

Don't worry if the rubber circumference breaks on the ring – it can't stretch enough to fit around the piston.

Once the locator ring is on the piston, slide the ring to the middle of the piston.



Reassembly the actuator screw and its two washers, making certain that the copper side of the larger washer fits towards the caliper housing. Lubricate the piston cylinder and piston with brake fluid. Fit the actuator fully into the piston. Reinsert the spring into the cylinder. Insert piston all the way into the cylinder and ensure that the locator ring is behind the retaining ring groove. Insert retaining ring with internal snap ring pliers.

At this point the end of the actuator screw will be extended through the rear of the caliper. Reassemble and tighten the parking brake arm and its washers onto the end of the actuator screw. Fit on the return spring to the parking brake arm.

Seat the metal retaining ring of the new piston boot into its groove inside the caliper. Lubricate the inside of the boot and end of the piston with silicon grease. Fit the small opening of the boot over the end of the piston, and seat into the second groove on the piston. Note that the first groove is used to hold on the inner brake pad retaining clip.

Insert the plastic check valve button into small hole in the end of the piston. Reassemble the pads, reinstall the caliper, and you are done. Make sure to add new brake fluid and bleed the brakes well before going out for a test drive on your favorite road.