

# Rebuilding Drum Brake Cylinders

By Bruce Smith

**H**ow old are your drum brake cylinders? Have you had them replaced or rebuilt this century? Drum brakes are pretty robust, so their maintenance is often overlooked if they're working sort-of well. Changing brake fluid every couple of years is good practice, as is replacing soft brake hoses if old or questionable. Though the wheel brake cylinders should be inspected every once in a while, they are often ignored.

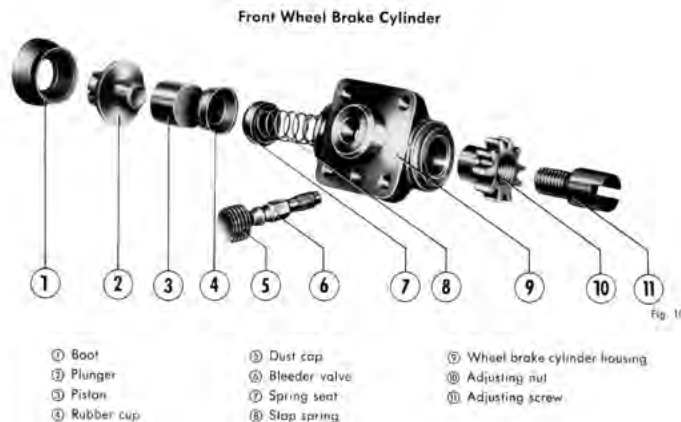
Next time you take a drive, get up to speed and stomp on the brakes on a long, empty straightaway. If the stopping leaves you less confident than you were before you left the house, it's time to take a closer look at your brake components. Check the shoes and hardware. If soft lines are old, or you're not sure about them, they should all be replaced. You can do all four corners for a little over \$100. Front and rear brake cylinders should be inspected for leaks or damage. If any one of them is bad, it's a good idea to attend to all six. An entire set will cost you about \$300 for aftermarket, or about \$200 each (times six) if you want original-equipment ATE parts. On the other hand, if they are in good enough shape, your cost can drop to about five bucks each in parts to rebuild them and replace the seals. To me, this and an afternoon's work is money and time well spent on a pretty straightforward task.

Once you've removed the wheel drums, take out the return springs, spring retainers, dowel pins, springs, brake shoes, and parking brake actuator (for rear wheels). Then remove the brake hoses and the bolts holding the cylinder to the back plate. The photos from the workshop manual below show the tear-down of the front and rear cylinders, with the parts found inside of each.

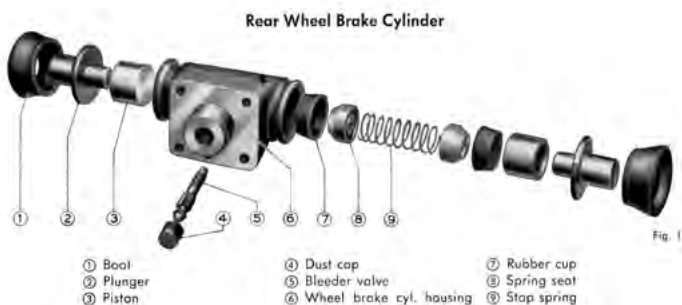
The rear cylinders have a pair of plungers and pistons, together with rubber piston cups, spring seats, and a main spring. The rubber cups and boot are the main wear parts. The spring and spring seats may be as well, although those are usually reusable. The front cylinders have a single plunger and piston, with an adjuster at the other end. Rebuilding a brake cylinder involves cleaning every part, replacing seals, and restoring the surfaces of the pistons and cylinder. Both are likely to have some degree of corrosion or pitting.

Below is a photo of what you might find as you inspect things. Here is a rear cylinder that seemed to function fine, but inspection revealed that it had been leaking fluid for a while. The water absorbed by the brake fluid will rust the cylinder housing, as is evident from the color of the seepage. This is an original ATE cylinder, not a reproduction part of unknown origin, so it's worth the effort to try to rebuild it. Some aftermarket cylinders are better than others, and the current versions offered by Stoddard have proven to be very good. Others over the years have not fared as well.

Once you remove the cylinders, tearing them apart is fairly simple. You may be lucky enough to push the rear plungers out of the bore. But if they are stuck, you can place the fitting from an air gun over the bleeder inlet to force them out. This will be especially needed



A rear brake cylinder with signs of leaking.



The breakdown of the components in the front and rear brake cylinders.

for the front cylinders, with a plunger on one end and the other end of the bore closed off for the adjuster. Wrap the cylinder in a shop rag to keep the parts and brake fluid from flying everywhere. Apply a blast or two of compressed air and things should come apart.

The rubber cups and the spring seats should be separated and removed. The photo below is what you'll have after disassembly and wiping things down a bit. The springs and spring seats are usually in good shape, so the replacement parts could be limited to new rubber cups and boots. Clean things up with soap and water rather than a solvent that could contaminate cylinder walls and seals. The outside of the housing will rust if you leave it wet, so dry it off. The housing can be protected once everything is back together.



**Disassembled rear-wheel cylinders and parts. The rubber cups and boots at the top will be replaced with new ones.**

The next step is to polish the pistons and hone the cylinder bores. A few types of pistons have been used: steel, aluminum alloy, and stainless steel. It's pretty easy to tell them apart, as aluminum pistons are about 10 grams and steel are twice that. You will probably find some rust pitting in the steel, versus some light surface corrosion on the aluminum pistons. All traces of surface contamination and corrosion need to be removed. You can start with a brass brush followed by some very fine sandpaper. Sanding beginning with 1000-grit might work, but if coarser grit is needed, step through grits to finish with 1000. If there is severe pitting, the pistons may need to be replaced. Stainless steel replacement pistons are available for about \$15–20 each.

Cylinder bores also need to be made smooth, with all surface corrosion and pitting removed. This is done with a brake cylinder hone. There are a few designs and sizes available, but the relatively small size of 356 drum cylinders limits the choices. Though a few sizes were used early on, most cars use 19mm cylinders and pistons (a 19.05mm bore), the same size found in VWs. Adjustable drum brake hones are usually made in a larger size for a 0.75–2.5-inch range and a smaller size for 0.5–2.25-inch. As 19mm is 0.75-inch, only a small size hone will usually fit into the cylinders. The photo at the top of the next column shows one of the smaller hone varieties.

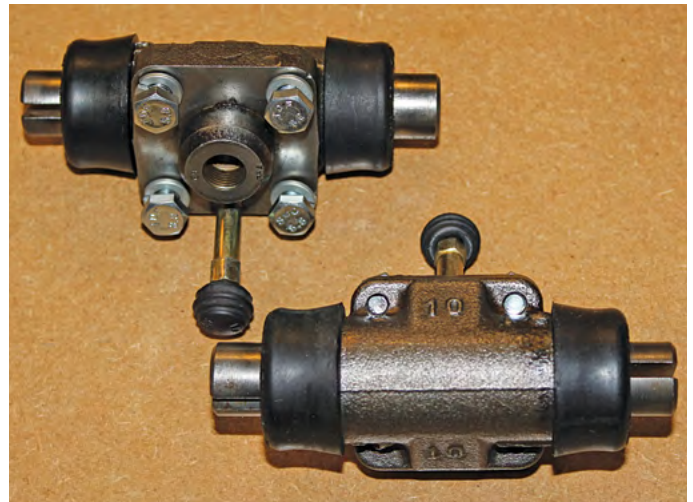
The hone is chucked into a variable speed drill and adjusted for light to moderate pressure on the inside of the cylinder. The honing stones and cylinder wall should be liberally lubricated with brake fluid. The cylinder can be clamped in a vise or otherwise secured. The hone should be rotated at a low speed while moving it in and



**The brake cylinder hone inserted into a rear brake cylinder.**

out of the cylinder through the full length of the bore. After several passes, inspect the progress, and continue until all traces of corrosion are removed. Increasing the pressure of the hone might be needed. A uniform, cross-hatched polishing pattern should result. If pits are too deep to remove, the cylinder should probably be replaced.

After honing, all parts should be cleaned again, then assembled using brake fluid as a lubricant. Some folks advocate also lubricating the pistons with a light coating of silicone-based brake grease, which is compatible with seals and seats. This could help keep pistons from corroding, though good boots and seats should prevent reactions with fluid or air from the neighboring ends.



**A set of rebuilt rear cylinders, surfaced and honed, with new seals and boots.**

Reassembly is pretty simple and should include the new rubber cups and boots found in a basic rebuild kit. Once together, the outside of the housing should be cleaned of brake fluid and painted, or otherwise coated to prevent rust from forming. I like a coating called Gibbs lubricant, as it's an excellent penetrant that will inhibit corrosion. It's much better than the temporary protection of WD-40 or the like. A finished pair of rebuilt rear cylinders is shown in the photo above. These have since been installed, along with the four in front, hopefully ready to provide many more years of happy motoring. <sup>356</sup>

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