Avoid one of the most common restoration errors with our complete guide to Mopar brake master cylinders—1967-1974.

About the Author

Brad Schroeder is a long time Mopar guy. His personal preference leans towards Challengers, with a '70 ragtop, and a T/A (that he's owned since 1978) currently filling his midwest garage. Brad is a Senior Product Engineer for one of the largest brake outfits in the world: Brake Parts, Inc., who we best know as the manufacturer of Raybestos and NAPA's United brands. Brad has long been frustrated by the eyesores that pass as "correct" master cylinders in muscle era Mopars, so, after years of research, he graciously hooked us up with this article, which will be the reference for decades to come.

—R.E.

Story and Photos By Brad Schroeder

As the Mopar muscle car restoration hobby has evolved over the years it seems almost every part, nut and bolt of the cars of the era has been thoroughly studied and documented, with one glaring exception: brake master cylinders. As a result, when admiring show cars and restored cars featured in magazine articles you'll no doubt see a hodgepodge of different master cylinders on otherwise similar cars.

Unrestored cars, typically the most invaluable source of reference data, are also often not accurate in this area. Standard non-mineral based brake fluid is hygroscopic.

1. Drum brake master cylinders can be identified by their equal size front/rear reservoir areas (left). Disc brake master cylinder (right) has one reservoir much larger than the other. This assures ample fluid even as pads wear and caliper pistons move out.
3. Disc brake-equipped B-bodies from 1967 through 1969 had one of two styles of master cylinders. P/N 2883058, shown here, has outlet ports on the engine side of the casting. P/N 2944477 for 1970 B Body (except Hemm) is the same except for some minor internal (piston stroke) differences. Note overall narrowness, the Bendix logo, casting number (2226821), and piston retainer screw visible on the bottom.

4. The second style of '67-'69 B-body disc brake master cylinder is the 2891668 (same as 2944376). This unit has outlets located on the fender side of the casting. Note date code and manufacturing info metal-stamped into the casting (circled, see photo 7 also). Casting number (bottom) on these is 225621.

5. Disc brake master cylinders manufactured prior to mid-1969 have a bail wire tag which contains date code information. This example, reading "9043", was manufactured on the 43th day of 1969.

6. Disc brake master cylinders manufactured from the '67-'74 Mopar muscle car era.

Mopar muscle cars of this era had one of two types of braking systems: either 4-wheel drum brakes, or front disc brakes and drum brakes in the rear. These two types of brake systems use different master cylinder designs.

Four-wheel drum systems use a master cylinder with equal-sized front and rear fluid chambers. They usually also have internal residual check valves in the two outlets where the brake lines thread in, in order to maintain a small amount of pressure in the system when the brakes are not applied. This residual pressure keeps the lip sealed of the wheel cylinders' internal cups in position to prevent brake fluid from leaking past the

ic, meaning it absorbs water, and over time enough water can be absorbed to cause rust in internal brake system components. Even a low-mileage unrestored car that has been stored for 30 years may have had its master cylinder fail and then replaced with a non-correct part. The purpose of this article is to help to identify correct original equipment master cylinders from the '67-'74 Mopar muscle car era.
cups and air from being drawn back into the wheel cylinders when pedal pressure is relaxed. (Residual pressure valves were discontinued soon after this period, rendered superfluous by a wheel cylinder redesign.)

Chrysler drum brake master cylinders from this era were manufactured by the Bendix Corporation. The Chrysler part numbers and casting numbers for drum brake master cylinders are shown in Table 1. The casting numbers can be found on the bottom of the casting. Through 1970, drum brake cylinder bodies were bare metal, lightly coated with a rust preventative and had a yellow zinc dichromate plated cap. In most cases this was the same for '71-'72 drum brake cylinders, though some NOS examples of these have a dull gray phosphate coating on the body and filler caps.

A disc brake master cylinder can be identified by the size of the fluid reservoir chambers. The chamber that supplies the fluid to the front brake circuit is much larger than that of the other chamber. This is because the pistons in the disc brake caliper displace further out of their housing as the brake pads wear, and more fluid is displaced from the cylinder during this process than is needed to displace the pistons of the wheel cylinder and prevent the compensating port (in the master) from sucking air.

This is why it is very important to never use a drum brake master cylinder on a car with disc brakes. As the brake pads wear, the fluid level can lower in the reservoir to the point where air is ingested into the system, resulting in a very soft pedal or even brake failure. Having a drum brake cylinder on a disc brake car looks bad to someone with a trained eye, but is seldom seen on someone's beautiful Mopar rear end another car at the traffic light because of this error looks bad to everyone.

The original equipment manufacturer for all disc brake master cylinders during this era was also Bendix. Bendix painted most of their disc brake master cylinders gloss black well into the '70s. The filler caps and all wires were installed prior to this painting process. That's right, those shiny gold filler caps may look nice, but they are never concours correct for a '67-'74 Mopar with disc brakes. Like in the case of drum brake master cylinders, a few NOS examples from the early '70s have been observed with the dark gray phosphate coating. The Chrysler part numbers and casting numbers for disc brake applications are shown in Table 2. (page 84)

Identifying master cylinders not in their original Chrysler boxes can be a challenge as the Chrysler part number was not cast or stamped on the part. Starting sometime in 1971, many master cylinders included a stamped metal tag attached to the filler cap ball which included the last 4 numbers of the Chrysler part number. For those parts that do not have such a tag the Bendix casting number located on the bottom of the casting is the best guide in identification. Sometimes, the same casting number was used in more than one master cylinder. In the examples covered here, there could...
be minor differences in the internal pistons. In some cases, there was no apparent difference, and there would appear to have been several Chrysler part numbers assigned to the same part.

For those doing factory-correct restorations, there is an alternative to the fun and financial hardship that comes from trying to track down NOS master cylinders. Don’t throw away those old original equipment cores. Used original master cylinders can usually be rebuilt and restored. Aftermarket kits are available to rebuild original master cylinders. These provide new internal components, such as rubber cups and seals, to replace those that have worn out.

If the cylinder bore is not badly pitted from rust, it can be lightly honed. Cylinders that have pitted bores, or that won’t clean up at a few thousandths oversize, can be professionally reused with stainless steel or brass, and no show judge will ever see this repair—100% stock external appear-

ance will be retained. We found two companies able to perform this operation, both with good reputations—see sources. It is best to deal directly with these specialty companies. Sad stories exist of people sending rare original parts to through local auto parts stores for reconditioning, only to return back a different equivalent rebuilt aftermarket cylinder. Companies such as the

Table 2—Front Disc Brake Master Cylinders

<table>
<thead>
<tr>
<th>Chrysler Part No.</th>
<th>Bore Diameter</th>
<th>Casting No.</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2808600</td>
<td>1&quot;</td>
<td>2225411</td>
<td>'67-'70 A Body Power and Manual</td>
</tr>
<tr>
<td>2881870</td>
<td>1 1/8&quot;</td>
<td>2226011</td>
<td>'67-'69 C Body</td>
</tr>
<tr>
<td>2981668</td>
<td>1 1/8&quot;</td>
<td>2225621</td>
<td>'67 B Body All '68-'69 B Body with 426 Hemi</td>
</tr>
<tr>
<td>2944470</td>
<td>1-1/8&quot;</td>
<td>2226821</td>
<td>'68-69 B Body except 426 Hemi</td>
</tr>
<tr>
<td>2883058</td>
<td>1-1/8&quot;</td>
<td>2225621</td>
<td>'70 C Body</td>
</tr>
<tr>
<td>2883069</td>
<td>1-1/8&quot;</td>
<td>2229171</td>
<td>'70 E Body except 426 Hemi</td>
</tr>
<tr>
<td>2944445</td>
<td>1&quot;</td>
<td>2229191</td>
<td>'70-'71 B Body with 426 Hemi</td>
</tr>
<tr>
<td>2944476</td>
<td>1 1/8&quot;</td>
<td>2226821</td>
<td>'70-'71 B Body with 426 Hemi</td>
</tr>
<tr>
<td>2944477</td>
<td>1-1/8&quot;</td>
<td>2225221</td>
<td>'70 B Body except 426 Hemi</td>
</tr>
<tr>
<td>2944470 (note 2)</td>
<td>1-1/8&quot;</td>
<td>3461178</td>
<td>'71-'75 B Body except 426 Hemi or manual brakes '71-'75 C Body</td>
</tr>
<tr>
<td>3461176</td>
<td>1-1/32&quot;</td>
<td>3461187</td>
<td>'71-'74 E Body except 426 Hemi or manual brakes '71-'77 D100 D150 truck</td>
</tr>
<tr>
<td>3461178 (note 1)</td>
<td>1-1/32&quot;</td>
<td>3461187</td>
<td>'71-'74 A Body except manual</td>
</tr>
<tr>
<td>3580184</td>
<td>1&quot;</td>
<td>2229271</td>
<td>'71-'75 B Body manual brakes '71-'74 E Body manual brakes</td>
</tr>
</tbody>
</table>

Note: Master cylinders with casting number 2225021 have outlets on fender side. Master cylinders with casting number 2226821 have outlets on engine side. All master cylinder numbers with the same casting number are the same externally and have same bore diameter. There are minor differences internally with pistons or in some cases no internal differences. They should be interchangeable except (1).

(1) Identical to Chrysler 3461176 except has minor stroke (piston) travel difference.
(2) Has 4 dog-point mounting studs pressed in flange.
8. In 1970 disc-brake Challengers and Barracudas (except Hemi) used Chrysler part number 2044453. Casting number was 2229171.

9. Installed originally on the less than 1000 Hemi B- and E-bodies in '70 and '71 equipped with disc brakes, the rarest Mopar master cylinder is the 2944476. It is very similar to the 2944453 but can be identified by the raised boss and retaining screw on the bottom of the casting, and also by the casting number (2229191). If you need one of these, expect to pay big bucks.

10. The most common disc brake master cylinder is the 3461176, which was installed on B-, C-, and E-body cars from 1971 through 1975. 3461178, which was installed on many A-bodies, uses the same casting and is identical other than minor internal piston stroke differences. Note that there's no piston retainer screw or boss. '75-up masters were similar to this, but a tad larger—until the changeover to aluminum 2-bolt units that began in 1979.

11. The 3461184 was installed on 1971-1972 B- and E-bodies with 4-wheel drums. Thankfully, starting in 1971, many master cylinders came with a tag on the ball wire which included the last 4 digits of the Chrysler part number. This style master cylinder was used as a semi-universal drum replacement by the aftermarket, so it's a common (and obvious) goof to see it installed on earlier cars.

corrosion, although the advantages of silicone still outweigh the disadvantages by a wide margin. An alternative preventive measure is to use conventional DOT 3 or 4 brake fluid and change it at regular intervals. This is something that should be done in a car whether it is your daily drive or a never driven trailer queen. Performing this simple maintenance task can dramatically increase the life of hydraulic brake components.

SOURCES:
Brake & Equipment Warehouse, Inc., 455 Harrison St., NE, Minneapolis, MN 55413; 612-373-3141; 800-233-4053
White Post Restorations, One Old Car Drive, P.O. Drawer D, White Post, VA 22663; 540-837-1140; www.whitepost.com