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Wagner Brake Pressure Differential Valve Rebuild

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This document describes how to rebuild the Wagner brake pressure differential valve (sometimes called a "distribution block") and front disk brake pressure control valve (sometimes called a "proportioning valve") used on Ford and Lincoln/Mercury vehicles by replacing the internal parts that typically wear out after years of service. Tools needed:

5/8" socket or box wrench	Clean brake fluid
1/2" socket or box wrench	Liquid ammonia
9/16" open end or box wrench	Isopropyl alcohol
Needle-nose pliers	Steel wool
Dental pick (or other small, pointed tool)	.38 caliber bore brush
Heat gun	Cotton swabs
Small drywall screw	

The rebuild kit provided by Muscle Car Research LLC includes the following parts:

O-rings	Proportioning valve spring
X-rings	Copper crush washer

The Wagner valves are identified by Ford engineering numbers that are stamped into the body of the valve. The parts in this kit can be used to rebuild the following valves (identified by both service part number and engineering part number):

Valve Type	Service Part Number	Engineering Number(s)
Pressure Control Valve (Proportioning Valve)	C70Z-2B091-B	C70A-2B091-A, -C, C90A-2B091-A
Pressure Differential Valve (Distribution Valve)	C7ZZ-2B257-D	C7ZA-2B257-E
Pressure Differential Valve (Distribution Valve)	C80A-2B257-J	C80Z-2B257-B
Pressure Differential Valve (Distribution Valve)	C8ZZ-2B257-A	C8ZA-2B257-E1, -E2, -G1, -G2, -J1, -J2, -L1

Arrange your valve, tools, and rebuild kit on a clean work surface. Let's get started! The first step is to inspect the valve and make sure that the exterior is undamaged. Check the port threads for damage. Make sure the valve is securely attached to the mounting bracket. A loose mounting bracket can be tightened up by lightly tapping the brass mounting tab with a ball peen hammer. If any of the brass port threads are stripped or damaged you're better off finding another valve. If your valve passes the exterior inspection you're ready to disassemble it and inspect the internal parts.



Disassemble valve:

Use the wrenches or sockets to remove the brass fittings and the warning lamp switch. The piston inside the proportioning valve can be difficult to remove due to rust from a deteriorating spring. Whatever you do, do *not* attempt to push the piston out from behind by banging on it! There are small brass tabs in the end of the piston that will almost certainly be damaged (making the piston useless) if you try to force it out that way.

The piston can usually be removed by threading a small drywall screw into the visible end of the piston and pulling after applying heat to the open end of the valve. Do *not* heat the valve so much that it might melt the plastic and rubber pieces at the other end of the piston! If heat and pulling don't work immediately, try soaking the piston with a good penetrating oil.

Here's what you can expect to find after you've removed the piston, seals, and spring:



Here's the piston from inside the distribution valve:



Inspect the bores once the pistons have been removed. If the bores aren't perfectly smooth you should either replace the affected valve body or have the bores professionally sleeved.

Remove old rings and seals:

Remove the old rings and seals from the disassembled parts. A dental pick makes it easy to get under the o-rings.

Clean parts:

Soak the brass parts, including the body of the valve itself, for a few hours in a container of liquid ammonia. Ammonia does a great job of removing tarnish from brass, but be careful of the smell! Remove the parts, flush with water, and polish with steel wool. Clean the bores of the valve with the bore brush and make sure that the bores are perfectly clean - any corrosion or dirty residue that lingers in here can cause a leak or cause piston movement problems! Finish cleaning the brass parts using alcohol and cotton swabs.

Install new rings and seals:

Install the new seals from the kit as shown in the picture below. Dip each seal in clean brake fluid to lubricate it prior to installation.



Reassemble proportioning valve:

Align the piston assembly as shown in the picture below.



Lubricate the seals with brake fluid and insert the proportioning valve piston (the brass piston in the picture) into the valve body as far as it will go. *If everything is installed properly you should be able to move the piston in and out slightly against spring pressure.* If the piston can't be moved you need to figure out why before continuing. Install the brass port on the top of the valve and tighten only enough to form a positive seal with the o-ring. Note that the large o-ring that fits on the outside of the proportioning valve covers two small weep holes. Make sure those weep holes are clean and clear.



Now move to the distribution valve. Lubricate the seals with brake fluid and insert the distribution valve piston (the brass piston in the picture) only as far as it takes to align the groove in the piston with the warning lamp switch port in the valve body (the second port from left on the body in the picture). The probe on the switch needs to fit in the groove without touching the sides of the groove. If you make a mistake here your brake warning lamp will be

lit and you'll need to center the valve by bleeding the brakes as described in your Ford service manual.



Install the brass plug on the top of the valve and tighten only enough to form a positive seal with the copper crush washer. Install the warning lamp switch.



Mount the proportioning valve in the bracket and secure it by tightening the bolt. That's it! Your finished valve should look like the one pictured below.



Now you can reinstall the valve in the car and reconnect the brake lines to the valve. Start each line by hand as best you can to ensure that the fittings are threading in straight and smooth. Be careful - it's easy to cross-thread the fittings and damage the soft brass threads. Tighten each fitting with a flare nut wrench. Add brake fluid, bleed the brakes, and check for leaks.

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