



VM Valve Maintenance & Tuning

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About

The valve is the heart of any gun. A leaking valve can take down an otherwise perfectly working gun and make for a rather frustrating day. Here you'll find a couple tips and tricks to keep your cup seal working well and get more performance out of the valve.

One of the easiest maintenance jobs you can do with the VM valve is to change the o-rings on a regular basis. Luckily the two o-rings on the valve are very close to the same size as tank o-rings. Some people think they're the exact same but they're not. Tank o-rings are just close enough to work.

If you're at the field and your cup seal goes you can use a AutoCocker cup seal as a substitute since few places carry VM parts anymore. Cocker cup seals are a little shorter than VM cup seals so you may have to turn up the velocity a little to make up for the shorter dwell time.

When you get back home here's a cool trick you can try to get that cup seal back in working order. If the cup seal doesn't have any huge gashes on the seal surface you can use a hand drill and toothpaste to polish the seal. No joke! Here's what you do:



Make sure to leave a little space between the valve and cup seal.

Put the valve and cup seal in the hand drill as shown above. Put some toothpaste between the cup seal and valve body, push the two together, then start up the drill. Do this for a few minutes adding more toothpaste as needed. The toothpaste acts as a fine lapping compound and smooths out the rough surface on the cup seal and valve making a nice seal between the two.

If you've upgraded your VM with lighter internals you may have noticed a drop in velocity even though you haven't changed the valve position. This is because the lighter hammer is striking the valve for less time (dwell) and less air is passing through the valve. To compensate you can drill one of the outlets larger.

I don't recommend doing this with a hand drill! Strip down your VM so that it's as bare you can get it. Remove the o-rings from the valve then put the valve back in your VM. Remove the set screw that is on top of the receiver behind the feed block then set up the VM on a drill press or, preferably, a mill. Using a 3/16" drill bit (or a #7 or 13/64" if you have one of those), drill down through the hole into the receiver and valve making sure you don't drill too deep into the opposite side of valve. Drilling it this way will give perfect port alignment. This will also allow proper, unrestricted flow through the valve and body. If you drill just a larger hole in the valve, the hole in the body that the air has to pass through will still be small and cause restriction in the air flow.

Remove the valve and deburr the receiver where the bolt slides and where the valve goes so the o-rings won't get damaged. You can put sand paper on a wood dowel to do this. Then wash the receiver thoroughly to remove any

chips.

If you want to give the body a more finished look by plugging the newly drilled hole you can tap the hole with a 1/4-20 tap before deburring. Then buy a 1/4-20 x 3/16" set screw for the hole.

Using a 3/16" drill bit will give a good balance between increased air flow and good recock power. If you drill the hole in the valve too large, too much air will flow through the valve and up into the bolt and not enough will pass out the back of the valve to blow back the hammer.

For mega flow, drill through the VM body using a letter R or 11/32" drill bit. Do not put the valve in the VM! You only want to drill the transfer port in the body this large. You can then tap the hole with a 1/8" pipe tap and use a 1/8" NPT x 3/16" set screw in the hole.

For the outlet port on the valve use a 17/32" drill bit. You must be **very** careful when drilling this hole because the 17/32" bit will *just* fit between the two o-rings on the valve. If the drill is offset you could run into the o-ring grooves which could cause leaks.

<http://www.vm68.com>

Outlet:

17/64

Inlet:

17/64



Next, you can also enlarge the inlet port on the valve with the same 17/32" drill. This is very simple to do on a lathe so if you have access to one I recommend doing it this way. You could do this on a drill press, but be very careful and make sure everything is centered.

To finish things off you could get a KAPP (or similar style) AutoCocker cup seal. The stem is narrower and provides a higher flow through the valve.

It's important to remember that you should only port your valve with a 17/32" drill bit if you have a fairly light hammer. The stock hammer will not cycle reliably after doing this. If you're looking for light internals and professional valve work, drop [Doc's Machine](#) or [Palmer's](#) a line. They have experience working with VMs.



Left: normal 12 o'clock hole.

Right: 1/4" ported hole.

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