

# Introducing the new Powerhouse Valve System

by Airgun Hobbyist

Introducing the new Powerhouse Valve System created Don Cothran of Cothran Machine shop. Many of you may know him from his custom stainless steel upgrade parts for the Crosman 22XX and Discovery line of air pistols and air rifles. Don has spent the last 3 years working a valve system for higher caliber airguns. Following is an interview that I had with Don about the new valve:

AH: What was the goal for creating your new valve system?

DC: I wanted to create a light weight yet powerful airgun that will humanely take down big game. My pistol version weighs 4-1/2 pounds using the Crosman plastic stock and 2240 pistol trigger group.

AH: How long have you been working on the valve system?

DC: I have been working on the design and testing for 3 years now. I had made 8 prototypes prior to this one. This design has proven to be the most stable and long-lasting. I have tried the force reduction piston 5 thousandths of inch bigger and smaller and this is the ideal configuration to reduce air turbulence. I have had a few of my friends helping me test them and they all love the system.

AH: Tell me about the valve system itself.

DC: It is a Force Reduction System, by this I mean the force required to open the valve is very minor just a slight flick on the valve stem and it will open the valve. The system is designed to shut down quickly with no bouncing to reduce the waste of air consumed by each shot. It is made of brass with stainless steel valve stem and a polyurethane seal. The threads are fine so that I could enlarge the inner diameter of the valve. The transfer port is over a 1/4" wide in diameter. The valve seat is 5/16" wide. The valve stem is also enlarged to allow the insertion of the piston that will slide up and down in it. If you can see it, there is a pin hole in the side of the valve stem to push the stabilizer piston up so that it hits the force reduction piston and comes back down to push the valve close quickly. The force reduction piston removes the pressure from the valve stem.

AH: What kind of airgun do you need for this valve?

DC: It fits in a 7/8" inch tube which is the diameter of the Discovery, P-Rod and my stainless steel airtube. It can be tuned to shoot as light as a .22 caliber up to .45 caliber. The hammer spring is cut so that it is at rest when the airgun is not cocked.

AH: What are some of the numbers you have gotten with the different airguns?

DC: I have got 700fps with a 232 gr .357 caliber bullet on a 26" barrel. On the 29.5" barrel it will get 725fps that is 270ft-lbs of energy. On the .45 caliber airgun shooting a 330 gr bullet it achieved 330 ft-lbs of energy.



The front of the valve. It is designed to hold the force reduction piston and you can see the back of the screw.

AH: What is the fill pressure?

DC: I have filled mine up to 3,000psi. I have tried it at 3,500psi. So far that doesn't seem to be the maximum it can be filled to but I wanted to test it at a higher pressure. I don't recommend filling it up more than 3,000psi. Usually there is a point of diminishing return and as yet I have not hit that point.



From top left down, is the valve body, breech seal, valve stem, pop-it seal, spring guide, stabilizer piston, valve spring, going back to the top right and coming down is the valve face, force reduction piston with seal, the seal between the two halves and the front seal.

We have known Don for many years now. We own many of the custom parts that he has produced over the years. Each one meets Don's very high quality standards. The price for the valve system is \$120 and comes with a

2-year warranty. Don has always stood behind the quality of his work. He is very proud of the work he has done on this valve system and to me that means it is even beyond his high standard. At the time of this writing he has 25 ready for sale. He has plans to work on a valve system for the larger 1-1/4" airtubes. Since it is off the 22XX platform, there are so many options out there that you will have no problem coming up with one that is uniquely yours. For more information, visit [www.cothranmachine.com](http://www.cothranmachine.com) or call Don at 901-356-0569.



Three prototype airguns with Don's rear cocker, tubes, breeches, barrel bands and of course valve.