Weihrauch HW45 Air Pistol

By Todd Cooper

The German made Weihrauch HW45 is an air pistol I had wanted for a very long time. After owning and shooting many Webley spring-piston air pistols and single stroke pneumatics, the time finally came to try the famous HW45 (Beeman P-1 Magnum). Beeman refers to this pistol as “one of the most powerful spring piston airguns ever made”. The HW45/P-1 is indeed a powerful pistol when compared to the other available spring-piston choices.

I located a Weihrauch dealer in Canada who stocked the .22 caliber HW45 (aka P-1) and my order was placed. A week later the pistol was in my hands and ready for much testing, target shooting, and plinking. The .22 caliber version is rated below 500 fps(152.4 m/s) and is not classed as a restricted firearm in Canada. The velocity rating from Weihrauch states 130 m/s, which converts to 426 fps. No pellet weight or energy is mentioned with this rating. The .20 caliber version, with a velocity rating of 500 fps, is also acceptable as a non-restricted/non-registered firearm in Canada. The more plentiful pellet selection in .22 caliber made my choice very easy.

The HW45 is an over-lever design similar to the Webley Tempest, except the barrel is housed in an upper frame rather than standing alone. The cocking effort with the HW45 is a bit stiff but I have no trouble shooting 100 or more pellets in a session. The Beeman catalogue rates the effort at 18 pounds for the HW45/P-1 and 25 pounds on the Tempest.

The trigger on the HW45 is a two stage design that is adjustable for weight. I have not yet tinkered with the trigger on my gun but it feels crisp and very acceptable. The data from the factory states a 28 oz factory adjusted pull weight out of the box but my testing indicated 39.2 ounces.

The grips panels on the HW45 are checkered walnut slabs, fastened with two slotted screws on each side. After market Colt 1911 type grips from Pachmayr and Hogue will fit the HW45 and are a welcome accessory to these pistols. Grips are also available from Beeman and other various sources. Although the HW75/P-2 pistol shares the same standard grip as the HW45, the one-piece HW75 Match Grip will not fit the HW45 unless the grip shank is shortened and drilled to accept a bottom fastener screw. The HW75 pistol, with Match Grip, will have this alteration performed during the manufacture process.

Testing the velocity with the HW45 was an easy task but accuracy testing was a bit of a challenge. Many spring piston pistols often don't perform well when shot off a sandbag rest so I avoided the effort after an initial trial. I found that resting my forearms on a firm pillow and letting the pistol sit only in my hands worked reasonably well but was still not the best method for evaluating performance. This technique does not give a totally clear indication of top accuracy potential. Plenty of unsupported offhand shooting was done to get an idea of the shootability of this pistol. Ergonomics, balance, recoil, trigger feel, and shootability can all be evaluated through offhand shooting. This type of shooting will show how the gun functions without the aid of a rest.

TOPICS OF INTEREST

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HISTORY

The HW45/P-1 was born from the design of the Beeman importing company along with the engineering and manufacturing of the Weihrauch company. The close resemblance to the Colt 1911 frame shows the definite American touch. Colt 1911 after market grips even fit the P-1 frame, which was a very nice option to incorporate into this pistol.

When this pistol is sold through Beeman dealers it is labelled as the P-1 Magnum but when sold by Weihrauch dealers the label on the left side of the frame says HW45. Both labels have been available since the 1985 origin and Beeman catalogue #12.

In 1992 Beeman offered a limited edition P-1 with a duo-tone black/silver finish and deluxe rosewood grips, inset with the 20th anniversary medallion (17th edition catalogue). This special collector's version also came with a black zippered carry case and Beeman literature. Although the Beeman anniversary pistol was a limited edition, the duo-toned HW45 is still available as a Weihrauch label with plain black grip panels (in all 3 calibers).

In earlier years Beeman offered the P-1 in .177, .20 and .22 caliber versions. The .22 caliber version seemed to be dropped from the Beeman line around 1994 - 95 with the printing of the 19th edition catalogue. The .22 version has always remained available in the HW45 label.

One of the first prototypes of the P-1 Magnum pistol was the HW75 (Beeman P-2) single stroke pneumatic pistol. This pistol did not deserve the title "Magnum" but was marketed as a recoilless match pistol with firearm styling. The HW75/P-2 is very similar to the P-1 on the exterior, except for the larger functional hammer and the small frame release button. The interior has completely different components along with a more sensitive trigger unit.

SPECIFICATIONS

Overall Length	11.0”		
Barrel Length	6.7”		
Rifling	12 grooves		
Calibers Available	.177, .20, .22		
Weight	2 lbs 8.8 oz		
Rear Sight	adjustable for elevation and windage		
Sight Radius	9.38”		
Scope Groove	5.1” of usable length		
Grips	Walnut		
Beeman Rated Accuracy	.177 caliber = .30”,	.20 caliber = .31”,	.22 caliber = .40” **
Velocity Ratings	see list below		
Safety	manual lever type		

** Beeman rated accuracy is “best 3 shot center-to-center group recorded at 10 meters”

VELOCITY RATINGS

WEIHRAUCH CATALOGUE (2004)	
.177 caliber HW45	558 fps
.20 caliber HW45	available but no data listed
.22 caliber HW45	426 fps

BEEMAN CATALOGUE #18 (1993-94)		
.177 caliber P-1	600 fps	5.2 fpe
.20 caliber P-1	500 fps	5.5 fpe
.22 caliber P-1	450 fps	5.7 fpe

BEEMAN CATALOGUE #19 (1994-95)		
.177 caliber P-1	600 fps	5.1 fpe
.20 caliber P-1	500 fps	5.1 fpe
.22 caliber P-1	no longer imported	

BEEMAN CATALOGUE #20, #21, #22
same numbers as #19 catalogue

BEEMAN CATALOGUE #23 (2003)		
.177 caliber P-1	600 fps	5.3 fpe
.20 caliber P-1	500 fps	5.48 fpe

I wonder why Beeman reduced the rated energy output form 1993/94 to 1994/95 and then increased it again in 2003. Weihrauch's and Beeman’s current numbers seem to be very close to what is now normal for the HW45/P-1. Beeman’s velocity numbers are always taken with the lightest possible pellet but the accompanied energy rating indicates this fact. Weihrauch velocity numbers are a little slower but a slightly heavier pellet will have this effect. The pistols are the same so they are capable of the same output.

VELOCITY TESTS

The first 5 shots from my new .22 caliber HW45 pistol were definitely dieseling and were accompanied by the familiar burnt oil smell, loud noise and higher than normal velocity. This is expected from a new springer airgun with excess internal oils creating too much fuel. By the 25th shot the gun was producing consistent velocity readings with close spreads within shot strings. Energy output at this point was 6.05 to 6.24 foot-pounds of energy using various pellet types.

The fastest pellet tested was the 12.1gr RWS Hobby with an average velocity of 482 fps and 6.24 fpe of energy. The 13.9 gr RWS Meisterkugeln was pushed out at 448 fps which produced 6.20 fpe. Here is a sample velocity series during the first few tests:

Beeman FTS	14.9 gr	429, 422, 419, 430, 432	Ave = 426 fps	E = 6.0 fpe

After approximately 250 pellets my .22 caliber HW45 seems to have settled down to a slightly lower and more consistent velocity output. Energy output is now 5.6 to 5.8 fpe. The Hobby pellet now averages 461 fps and the Meisterkugeln does 433 fps. A sample velocity test.:

Beeman FTS	14.9 gr	419, 416, 414, 413, 417	Ave = 416 fps	E = 5.7 fpe

The gun lost about 5% energy, which is nothing to really be concerned about. With a future moly lube treatment I may even get this power back again. Velocity averages are now:

RWS Hobby	12.1 gr	461 fps
RWS Meisterkugeln	13.9 gr	433 fps
Crosman WC	14.3 gr	428 fps
Beeman FTS	14.9 gr	416 fps

I have now put over 350 pellets through the HW45 and velocity is still stable. Waxed pellets (Pledge furniture polish) have been used for the last couple of shooting sessions and accuracy is about the same. Chronograph results were:

Beeman FTS	14.9 gr	416, 423, 416 423, 417	Ave = 419 fps	E = 5.8 fpe

My next chronograph testing was after more than 600 pellets and velocity seems to have stabilized and has not changed in the last 200 pellets. This new tin of FTS pellets seem to be a little lighter than the previous two tins (14.5 vs 14.9). The results were:

Beeman FTS	14.5 gr	435, 430, 427	Ave = 431 fps	E = 5.98 fpe
RWS Hobby	12.1 gr	472, 472, 470	Ave = 471 fps	E = 5.96 fpe

As a final addition I tested the HW45 after more than 3000 pellets have been fired. The only thing I have done to this pistol since it was purchased was add a few gobs of Beeman's M2M moly paste to the mainspring, through the cocking arm slots. Moly was also applied to the hinge pivot pin and the feet on the ends of the cocking arms. Results of the velocity test were:

Beeman FTS	14.5 gr	432, 431, 430, 428, 428	Ave = 430 fps	E = 5.95 fpe
RWS Super-H-Pt	14.5 gr	430, 429, 429, 429, 432	Ave = 430 fps	E = 5.95 fpe
RWS Hobby	12.4 gr	463, 465, 462, 462, 461	Ave = 463 fps	E = 5.90 fpe

Note: The Hobby pellets used in the last velocity test were from a different tin (different lot #) with a slightly heavier weight. The FTS pellets in the last test were from a different lot number with a slightly different weight. The correct weights were used in the energy calculations.

The mainspring and piston seal were changed after 7500 pellets, due to a temperature sensitivity issue. The new parts made the pistol a lot less affected by cool temperatures. The original mainspring is still usable so I will keep it as a spare but the original seal was the cause of the problem and was damaged during removal.

The new mainspring has shot about 2000 pellets and is functioning fine. 14.5 grain Beeman FTS velocity results were:

Beeman FTS	14.5 gr	413, 416, 415, 413, 415	Ave = 414 fps	E = 5.52 fpe

This is a little lower than previous numbers but the pistol is now shooting very lean (no smoke). A little more velocity could likely be had by adding a few drops of spring oil through the cocking slots, as recommended in the Beeman P-1 owner's manual. I don't have any spring oil on my shelf but 100% pure silicon oil should work fine. I added 4 small drops onto the exposed mainspring and shot several pellets to distribute the lubricant. A very small amount of smoke was seen with each shot. This oil will help thin out the moly paste and likely increase velocity a tiny bit. The results were:

Beeman FTS	14.5 gr	422, 424, 420, 420, 424	Ave = 422 fps	E = 5.74 fpe
Super-H-Point	14.5 gr	422, 419, 420, 424, 425	Ave = 422 fps	E = 5.74 fpe

After 2000 pellets I am still getting the above results. Every few months the velocity starts to drop 5 to 10 fps because the oil has been used up. The pistol requires this fuel for top performance. Applying a few drops brings things back to normal again.

A couple of months after I purchased my .22 caliber HW45 a shooting friend purchased a duo-toned .22 caliber HW45. He preferred a .177 caliber pistol so an extra barrel was ordered through Beeman and installed. After adding some moly to the mainspring I was able to borrow the pistol for a weekend to perform velocity tests for comparison to my .22 caliber version.

The below numbers were achieved when my pistol was new and powered by the original seal and spring.

HW45 VELOCITIES (.177 cal)				
Pellet	Grain	Feet per second	Average	Foot lbs energy
Crosman Premier	7.9	537, 539, 538, 542, 536	538	5.08
H&N Silverpoint	11.5	447, 460, 456, 447, 459	454	5.26
H&N Finale Match	7.7	569, 572, 570, 567, 568	569	5.54
Beeman Crow Mag	8.8	513, 508, 505, 500, 507	507	5.02
RWS Meisterkugeln	8.3	547, 533, 540, 537, 534	538	5.34
RWS Superpoint	7.9	545, 555, 549, 548, 552	550	5.31
RWS Geco	6.8	593, 593, 585, 591, 591	591	5.28
Ruko Mag II	8.3	526, 521, 536, 532, 525	528	5.14

HW45 VELOCITIES (.22 cal)				
Pellet	Grain	Feet per second	Average	Foot lbs energy
Crosman Premier	14.3	397, 404, 396, 396, 393	397	5.01
Beeman FTS	14.9	426, 428, 425, 425, 425	426	6.0
Beeman Trophy	14.0	430, 433, 428, 430, 425	429	5.72
RWS Super-H-Point	14.5	435, 438, 434, 432, 437	435	6.09
RWS Meisterkugeln	13.9	439, 438, 436, 433, 440	437	5.90
RWS Hobby	12.1	472, 472, 470	471	5.9
H&N Match	13.75	439, 439, 443, 449, 445	443	5.99
Gamo Match	14.3	440, 436, 430, 432, 432	434	5.98
CZ Boxer	13.9	433, 432, 433, 434, 436	434	5.82

Notes

- did not have enough .22 Hobby pellets to test 5 shots
- the .22 cal CPs were a very loose fit which may be the cause of the low velocity
- the .177 cal CPs were a snug fit

ACCURACY TESTS

For accuracy testing I performed: offhand shooting using an isosceles stance, shooting with my forearms supported by a padded rest, and also shooting from a mechanical rest.

Testing a recoiling spring pistol for accuracy can be a bit difficult because the groups become erratic if the gun contacts any firm surface during the firing cycle. Freely holding the pistol seemed to give a good indication of the pistol's shootability and accuracy tendencies but these results are subject to my sighting error and marksmanship ability.

After detailed testing is completed it is the shootability that really counts and offhand shooting shows this tendency. If a pistol cannot be shot accurately with a freehand hold, it's not much fun to own. The clamped style rest is still the best method for determining the pistol's true accuracy potential without human error.

Offhand shooting with the HW45 was performed with a moderate/light grip pressure. The gun was allowed to recoil freely with a focus on good follow-through for tight groups.

Offhand Groups

My first offhand group was 10 shots with FTS pellets which formed a cluster measuring 1.5"ctc at the standard 10 metre distance. Two more offhand groups of five shots each with FTS pellets both produced nice 1.25" ctc groups. No bad for a new pistol. I shot another five shot group using RWS Hobby pellets and it was my best at slightly over 1" ctc.

Supported Groups

Next I used a pad rest to support my forearms while I shot a few more 5 shot groups at 10 metres. The Beeman FTS pellets made a nice 3/4"ctc group and Crosman WCs went into 1"ctc. With the RWS Meisterkugelns and CZ Boxer pellets I pulled one shot in each 5 shot group. To be sure it was just my error, I shot a 6th pellet, which went right into the main group cluster both times. With the 5 good pellets counting, the Meisters and Boxers shot 7/8" and 3/4" ctc respectively.

The best rested 5 shot group of the day went to the RWS Hobby pellet, a beautiful 9/16" ctc group that could be covered by a quarter. Overall I feel the HW45 is an accurate springer pistol. With an optical sight and a better shooter this gun should be capable of consistent cloverleaf groups at 10 meters.

More Offhand Groups

On the next testing day I shot a bunch more offhand groups with the HW45. I am amazed at how easy this springer pistol is to shoot at 10 metres, compared to the many Webley's I have owned. All groups were measured with a ruler for center-to-center (ctc) group size. All groups were shot offhand with a two hand isosceles hold:

Beeman FTS	5 shot group	1" ctc
Beeman FTS	10 shot groups	1 1/4", 1 1/4", 1 3/8", 1 3/8", 1 5/16", 1 3/8", 1 1/4" ctc
CZ Boxer	10 shots	2" ctc
Crosman WC	10 shots	1 5/8" ctc
H&N Match	10 shots	1 1/4" ctc

Offhand Shooting At Longer Distances

Next was offhand shooting at longer distances using tin cans as targets. I measured off 20, 25, 30, and 40 yards with my tape and then tin cans were placed at these distances. Approximate tin can sizes are:

Campbell's Soup Can	10 oz - 284 ml	2.7"Dia. x 3.9"H
Heinz Bean Can	14 oz -398 ml	3.0"Dia. x 4.4"H
Hunt's Pasta Sauce Can	22 oz - 680 ml	3.4"Dia. x 5.7"H
Large Coffee Can	1 kg- 2.2 lbs	6.1"Dia. x 6.3"H

My .22 caliber HW45 now wears a Millet SP-1 red dot, secured with Kwik-Site mounts. The red dot helps with long distance aiming and does not magnify any shooter's wobble. The small 3 moa dot size helps with any needed holdover estimates

The day was very bright so intensity setting number 8 was used on the Millet. This red dot has 11 intensity levels to choose from and I always opt for the lowest possible setting for the available lighting. Setting number 2 or 3 works fine for indoor shooting.

Beeman FTS pellets were used for all of today’s shooting. This pellet is also known as the H&N Field & Target Trophy. The RWS Super-H-Point is another accurate shooter in this pistol but I did the bulk of today's plinking with the 14.5 grain FTS. Both of these pellets shoot approximately 420fps from this pistol.

All distances were measured with a 100 foot tape. All shooting was offhand using an isosceles hold.

Results				
20 yds	Campbell's Soup Can	9/10 hits	10/10 hits	
25 yds	Heinz Bean Can	10/10 hits	8/10 hits	
30 yds	Hunts Sauce Can	8/10 hits	10/10 hits	
40 yds	Large Coffee Can	8/10 hits	8/10 hits	
40 yds	Hunt's Sauce Can	6/10 hits	5/10 hits	6/10 hits

Penetration

20 yards - usually penetration through both sides of can
- can falls and often flips

25 yards - usually a slot is ripped through one side of can
- can falls over

30 yards - a deep dent in can
- can falls over if hit solidly

40 yards - Coffee can does not fall over
- Hunt's can will often fall over if hit solidly

Notes

- took several sighter shots prior to scoring at each distance
- there was a slight breeze when shooting but nothing extreme
- all measurements were double checked prior to leaving the shooting area
- all shooting was carefully documented

Mechanical Accuracy

Testing the HW45 in a machine type rest is a difficult process due to the cocking cycle and the pistol's recoil. I decided to give it a try even though the results will not likely be 100% perfect. During this test I removed the grip panels and clamped the HW45 into a Black and Decker Workmate. For every shot the gun was removed and cocked and then returned to the clamped position. Care was taken to re-align the 9 power Bushnell Sportsman scope for every shot. All groups were 5 shots each and measured center-to-center with a ruler and recorded to the nearest sixteenth of an inch. The averages were converted to decimal for ease of comparison.

10 metre Accuracy		
Beeman FTS	11/16, 1/2, 3/8, 9/16	Ave =.53"
RWS Hobby	5/8", 5/8", 5/8"	Ave =.63" **
RWS Meisterkugeln	5/8", 3/4", 3/4", 1/2"	Ave =.66"
Beeman Trophy	1", 3/4", 3/4", 5/8"	Ave =.78"
Gamo Match	1 1/16", 9/16", 1", 1 3/8"	Ave =1"

20 yard Accuracy		
RWS Meisterkugeln	7/8", 1 1/8", 1 5/8"	Ave =1.20"
Beeman FTS	1 3/4", 1 3/4", 7/8", 7/8"	Ave= 1.31"

**I ran out of Hobby pellets so I could not shoot 4 groups

There was an annoying wind present when the 20 yard shooting was performed which may have affected the group sizes a bit.

Overall I think the .22 caliber HW45 is likely capable of a bit less than 1/2" groups at 10 meters (5 shot) and close to 1" groups at 20 yards, if a better vice was used on a dead calm day. The Workmate is not the most stable system to use but it's all I currently have.

Velocity-Accuracy Summary

We all know Beeman uses the lightest pellet for their velocity testing. Their stated velocity for the .22 caliber P-1 is 450 fps and their stated energy rating is 5.7 fpe. My HW45 still seems to be shooting perfect with over 450 fps using 11.9gr Hobby pellets and producing 5.7 fpe with various pellets.

My average accuracy with the favoured pellet is .53" for 5 shot groups at 10 metres. Beeman uses 3 shot groups at the same distance and they state .40” ctc accuracy. My accuracy seems about the same as that found by Beeman.

Overall I found this particular HW45 to be very comparable to the printed Beeman data.

MOUNTING OPTICS

Mounting optics on the HW45 can be a bit frustrating unless the correct mount is used. For some reason Weihrauch decided not to use the standard 11 mm dovetail groove size. The groove on my pistol measures 12 mm wide and I have contacted a few HW45 and P-1 owners and found their grooves are also the same. This is a small inconvenience but there are solutions.

The first mount I tried on my HW45 was a one piece SportsMatch OP25C (also known as Beeman 5040). This mount was designed for an 11 mm dovetail so the clamp would not sit properly with the 12 mm groove. The mount was also offset because the clamp is only on one side of the base. This was the strongest mount I owned and I wanted to use it with my Bushnell Sportsman 3-9X scope for accuracy testing. As a temporary measure I shimmed the 4 clamp screws with washers and this allowed a stable but offset scope set up to be used. As long as things were tight I could still test the HW45 for group sizes.

A pair of Burris rimfire mounts, and the mounts included with my Sportsman scope, were also tried but neither would clamp firmly on the 12 mm groove. A cheap 30 mm Chinese mount was also tried with no success.

The easiest way to mount optics on the HW45 is with vertically split mounts or mounts with claws on both sides. Both types work fine.

The vertical split mount allows the optical sight to be centered rather than being offset to one side. This is the type of mount I use for my Millet SP-1 red dot. Before clamping onto the sight's tube I placed a piece of black electrical tape inside each ring half to keep things tight. After more than 2000 pellets I have had no slippage of the sight or mounts. The mounts I use were purchased for $9.95USd from a sporting goods store in 2002 and they are called Kwik-Site Kwik-Mount /22 (model KS-T90B). These are aluminium alloy mounts designed for rimfire rifles with grooved receivers. Millet company sells the same one inch vertically split alloy mount (TP00709). Bushnell company also sells this same mount (76-3022). This vertical split mount has a fairly low profile so it might not be the best choice for scope mounting. For a 1" red dot it keeps the sight low on the barrel for a more compact appearance. After a bit of measuring I found this mount would allow a scope to be used with a maximum of a 1.5" diameter rear bell, if the bell was positioned in front of the rear sight.

The Millet dual claw, angle-loc, all steel, rimfire mounts are another fine choice for the HW45 pistol. This mount has claws on each side so the optical sight can be centered over the barrel. A friend of mine successfully used the Millet angle-loc on his duo-tone HW45 and had no problems. These steel rimfire mounts are available in low, medium, and high heights. This gives the shooter a choice when mounting a red dot sight or scope. The steel mount adds more weight to the package but some shooters may prefer this design.

For 30mm red dot sights the Millet all-steel mount and the Millet aluminum alloy vertical-split mount are both available. There may be other mounts that work on the HW45 pistol but the above are options I am familiar with.

POWER PARTS - Seals & Springs

Parts dimensions can sometimes be interesting information for some people.

Original factory parts dimensions	
Mainspring length	9.0"
Mainspring diameter	.653"
Mainspring coil thickness	0.094"
Mainspring coil count	34 (counting the ends)
Spring guide length	3.345"
Spring guide diameter	0.448"
Piston length	3.825" (with seal)
Piston diameter at skirt	0.858"
Piston diameter at middle	0.860"
Piston diameter behind seal	0.861"
Piston seal diameter	0.869”
Piston seal thickness	0.237"
Piston weight	3.6oz (4.4oz with top-hat/spring-guide)

The power stroke was measured at approximately 2.25".

Aug 2003
A new HW45 mainspring and piston seal were purchased.

Mainspring length	9.0"
Mainspring diameter	.651"
Mainspring coil thickness	.093/.094"
Mainspring coil count	34 (counting the ends)
Piston seal diameter	.869"

July 2004
A second new mainspring and piston seal were purchased.

Mainspring length	9.4”
Mainspring diameter	.653”
Mainspring coil thickness	.094”
Mainspring coil count	34 (counting the ends)
Piston seal diameter	.8695”

Mainspring Life
There have been rumours of the HW45 having a short mainspring life due to the high stress this spring experiences. Rather than disagree I decided to keep track of pellets shot with one of my mainsprings. After 7500 pellets it had only lost about 10 fps of velocity but still gave consistent readings. The spring was changed to gather more test information but it was saved for a spare. My current mainspring has slightly over 2000 pellets on it as of July 2004 and it still function wonderfully.

For more data I searched the British BBS Forum looking for HW45 postings. There were a few owners who experienced spring breakage or extreme weakening at 10,000 to 12,000 pellets. I could not find any comments for problems with less than 10,000 shots.

Breech Seal
The breech seal on the HW45 is a nitrile #009 o-ring. These seals can often be found at hydraulic supply dealers.

Before being told about the proper o-ring size I tried several different seals that were locally available. First was a 7/32"ID x 1/16" thick Standard o-ring and it fit the seal groove but was a little too thin to provide a perfect contact with the barrel. Velocity was a bit low with this o-ring. Then I tried a 5mmID x 2mm thick metric o-ring and it also fit the groove but was very snug. The barrel was difficult to close with the 2mm thickness and velocity was erratic. Finally, I

tested the #009 nitrile o-ring (.208"ID x .070" thick) and it worked great. My tested velocity with this seal is the same as with the original factory seal and after many months it still seems to be lasting fine.

Quad Seal
The quad seal was something that was mentioned on the Airgun Forum. I had never heard of these seals before but a trip to a local gasket & seal dealer put several in my hand. The quad seal has a non-rounded surface, which might give a better air tight seal.

A bunch of pellets were shot through the HW45 to warm things up. Velocities were good so the test started.

Beeman FTS pellets were used for the testing. This is the same as the H&N FTT pellet. My HW45 is running a bit lean right now so velocity is in the 415 fps area. If I add a couple of drops of acceptable fluid lube onto the spring I usually get in the 420s with this pellet. A lean burn is fine for me so I left the pistol alone.

#009 Nitrile O-Ring	417, 413, 415, 416, 415	Ave = 415 fps
#009 Nitrile Quad Seal	419, 425, 418, 420, 413	Ave = 419 fps
#009 Nitrile O-Ring	419, 417, 413, 420, 413	Ave = 416 fps
#009 Nitrile Quad Seal (#2)	413, 414, 420, 417, 419	Ave = 416 fps

I let the pistol rest for almost an hour. This sometimes gives me a few fps but no major increases.

#009 Nitrile Quad Seal (#2)	419, 420, 418, 418, 418	Ave = 419 fps
#009 Nitrile O-Ring	419, 417, 418, 419, 421	Ave = 419 fps

Conclusions
- the o-ring and quad seal give the same velocity results
- once the breech seal settles, the velocity becomes very consistent with either seal
- a dry pistol (no liquid lube) has a very lean burn and slightly less velocity than a well lubed pistol

DISASSEMBLY & TUNING

There are a few tricks to disassembling the Weihrauch HW45 pistol. I have instructions from the Vol.3, No.4 April 1996 Airgun Letter and have done the complete procedure several times on my own pistol. This is a good AGL issue to purchase if you have a chance. It also has an article on the Mac-1 LD pistol.

Disassembly Procedure

You will need pin punches, plastic hammer, 2.0mm and 2.5mm hex wrenches, a paper clip, and rags.

1- Remove the grip panels.

2- Put the end of a paper clip through the hole in the lower end of the safety rod (part #8641). This is the hole you will see in the rod that pops through into the lower cavity in the grip. You will only see the end of a set screw and this rod sticking into the lower grip cavity. Put the paper clip through the hole and leave it there so the rod will not move upon disassembly/re-assembly of pistol. The upper frame must be closed (latched shut) to get the rod into position to see the small hole.

3- Loosen, but don’t remove, the 2.0mm hex screw located under the muzzle.

4- Open pistol by pulling hammer back. Don't cock it!

5- Push out pivot pin that secures muzzle end of upper frame (part #8610). It is located below the front sight.

6- Invert pistol. Separate barrel group (upper frame) from action. The two cocking arms require some fiddling to release them from their slots. They come out through the enlarged opening at the rear of the slots.

7- Loosen 2.5mm hex screw located under the front of pistol (part #8983). It has a large head. This screw holds the front of the cylinder in place.

8- Drift out large cylinder pin located below rear sight on side of frame (part #8612). There are three pins located there. The large one is the one we want to remove. It secures the rear of the cylinder. Support side of pistol when drifting out pin.

9- Pull back hammer to pop compression chamber up from it's seat.

10- Remove 2.5mm screw, which you previously loosened. It may help to tap screw head lightly to free the cylinder if cylinder is stuck. Use a synthetic hammer.

11- Remove compression cylinder from pistol.

12- Some people use a small bar clamp to do this next step. Apply pressure to mainspring and drift out pin at end of cylinder (muzzle end) and decompress mainspring.

A small Quick-Grip adjustable bar clamp is what the Airgun Letter author uses for the HW45 spring compressor. Tom used a Vise-Grip brand 12"(300mm) model 00512. When using this unit, make sure you support the side of the cylinder when tapping out the cross pin (#8902).

Tapping the Vise-Grip lever will allow the HW45 mainspring to be decompressed slowly. Light taps with a hammer work to achieve this objective.

One of the soft end pads on the clamp should be notched to receive the mainspring cylinder projection. This is the little spring loaded lever that is located at the bottom of the cylinder, at the rear.

A 5" piece of vinyl tubing (1.0 -1.25"Dia) can be used as a sleeve to slide along the mainspring as it decompresses. This gives added resistance to side pressure for safety reasons. The sleeve can be slid over the cylinder and moved down as the spring is slowly decompressed.

I do not use the Vise-Grip clamp when working on the HW45 but sometimes an extra set of hands is useful when a compressor is not used. When re-installing the mainspring I prefer to use a rod as a guide. The rod can be a large nail, a section of a ballpoint pen tube, or whatever fits. The pen tube (rod) worked fine for me. I insert the short rod into the end cap (#9462) when I push down on the cylinder during spring insertion. The rod helps prevent the spring from buckling. The end cap pin (#8902) can only be pushed part way until it hits the rod. Once the end cap pin is partially in place the rod can be removed and the pin inserted completely. The length of this rod cannot be too long or it contacts the spring guide when the spring is compressed. Approximately 5cm to 7cm works fine for a rod length.

If you want to remove the piston you need to be careful not to damage the seal on the inside edges of the cocking slots or the holes at the end of the cylinder. If you plan on replacing the seal then you have no worry with removal.

The piston seal is carefully pried off using the two slots in the piston, located behind the seal. A small slotted screwdriver works fine for this task but often results in a damaged and non-reusable seal. I would not recommend removing the seal unless replacement is planned.

Make sure there are no burrs on the inside of the cocking arm slots. Carefully remove all burrs prior to piston installation.

Lube Tune

I do not recommend a complete disassembly on a new or fairly new HW45. If the pistol is giving decent velocity the parts are likely working fine and don't need replacing. A basic lubrication is all that is needed.

Here is the process that I use for the HW45 Basic Lubrication:
1- Open the breech but do not cock pistol.
2- Loosen the 2.0mm allen screw that secures the barrel pivot pin. The screw is located below the muzzle, under the frame.
3- Push out the pivot pin (part #8610).
4- Slide the cocking arms to the rear of the slot where they can be wiggled out. Do not pull up on the upper frame when sliding the arms. You will have to slide the upper frame rearwards because the arms will be caught in the slots and should not be forced.
5- Use an opened paper clip or toothpick to apply moly paste to the cocking slot sides/edges.
6- Apply two small gobs of moly lube onto the visible spring coils and into the spring centre, using the paper clip. Two gobs about the size of the eraser on a pencil is all that is needed.
7- Attempt to loosen the 2.0mm set screw that secures the upper end of the cocking arms to the upper frame. If it is too tight, don't bother.
8- If the screw loosens you can slide out the pin and moly lube the pivot holes in the arms and also the pin before re-assembling.
9- If the screw doesn't loosen you can apply some pellgunoil to the pivot area or a mixture of pellegunoil and moly paste. Drip a little bit into the pivot pin area.
10- Apply moly paste to the feet on the cocking arms (bent ends).
11- Wipe down barrel and exterior of compression tube with a very very light coat of pellgunoil or 30W-ND motor oil or a favoured oil.
12- Apply moly paste to the barrel pivot pin and friction points of the hinge.
13- Re-assemble pistol.
14- The barrel can be cleaned with soft cotton patches and a pull-through made from fishing line or weedwacker cord. Do not use brushes or metal rods in your airguns. A bit of Simple Green or GooGone can be used to wet patches. Dry patches should follow.

A new HW45 will smoke a bit when shot. This smoke will diminish but will not go away completely. This pistol burns rich compared to many other springer airguns. A little smoke is fine but detonation is not fine. You don't want the loud detonation sound accompanied by extreme velocity readings.

The above lubrication process should last at least 5000 pellets, maybe longer. As an option, you may also apply 2-3 drops of spring oil onto the mainspring to thin the moly paste lubricant.

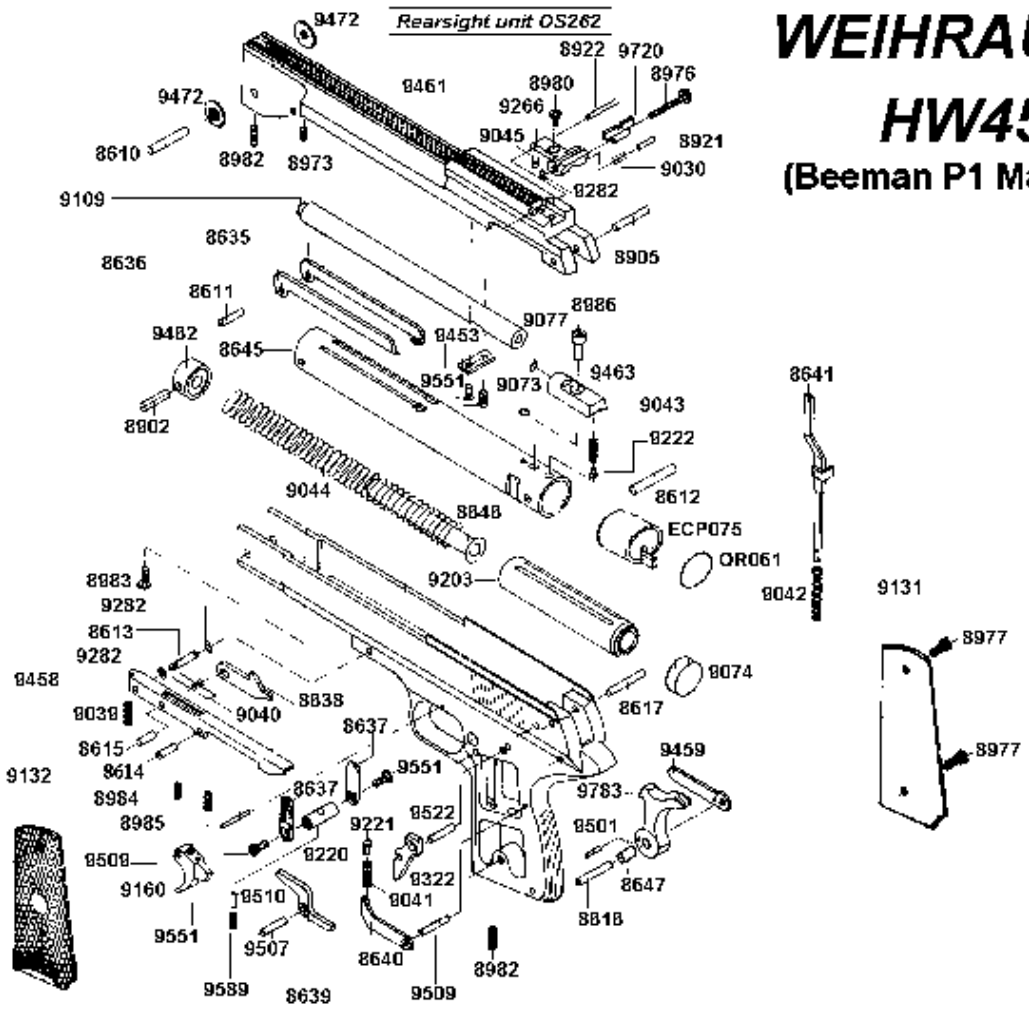
Complete Lube Tune

Clean off all the factory lubricants from the cylinder, piston, and mainspring. Clean cotton cloths and a synthetic tipped cleaning rod work fine for this task. Before lubing and re-assembly, I polish the HW45 mainspring ends with emery paper (80-150-240-320 grit) and clean it thoroughly.

Over lubing the HW45 will slow it down. Don't use heavy spring tar or mainspring dampening compounds if you want top velocity. Using these products will help eliminate vibrations when velocity is not a concern.

Most tuners will apply a thin coat of moly paste to the outer perimeter of the seal and a 1" band behind the seal and at the piston skirt. The HW45 has a straight walled piston so I prefer to apply a thin layer to the entire body (inside&out). During re-assembly I applied Beeman's M2M moly paste to: piston seal perimeter, piston body exterior, inside piston, mainspring, mainspring ends, spring guide, cocking arm "feet", pivot pins and hinge, loading latch hook. I also burnish a small amount of moly into the chamber and removed excess.

PARTS DIAGRAM



PARTS LIST - Weihrauch HW45

Part Number	Description
8610	Cocking arm pivot pin
8611	Cocking lever pivot pin
8612	Cylinder pin
8613	Trigger bar pivot pin
8614	Sear stop pin
8615	Sear lever pin
8616	Hammer pivot pin
8617	Hammer stop pin
8635	Cocking lever - Right hand
8636	Cocking lever - Left hand
8637	Safety lever
8638	Sear lever
8639	Trigger lever
8640	Trigger spring adjustment lever
8641	Safety rod
8645	Cylinder
8646	Spring guide
8647	Hammer bushing
8902	End cap pin
8905	Cocking arm latch pin
8921	Rearsight windage plunger
8922	Rearsight hinge pin
8973	Cocking lever pivot pin screw
8976	Rearsight windage screw
8977	Grip screw Each
8980	Rearsight elevation screw
8982	Trigger spring lever screw
8983	Cylinder lockscrew
8984	Trigger adjustment screw
8985	Trigger adjustment screw
8986	Cylinder saddle screw
9030	Rearsight windage spring
9039	Trigger bar spring
9040	Sear lever spring
9041	Trigger lever spring
9042	Safety rod spring
9043	Hammer spring
9044	Mainspring
9045	Rearsight elevation spring
9073	Air channel seal

PARTS LIST - Weihrauch HW45
(Beeman P1 Magnum)

(Cont)

Part Number	Description
9074	Piston washer
9077	Breech seal
9109	Barrel .177
9109	Barrel .22
9109	Barrel .20
9131	Grip - Right hand
9132	Grip - Left hand
9160	Trigger
9203	Piston
9220	Safety bolt
9221	Trigger lever plunger
9222	Hammer spring plunger
9266	Rearsight housing
9282	Rearsight windage screw circlip
9282	Trigger bar pivot clip
9322	Sear
9446	Frame
9453	Barrel set plate
9458	Trigger bar
9459	Cocking rod
9461	Cocking arm
9462	End cap
9463	Cylinder saddle
9472	Cocking arm shim
9501	Hammer spring pin
9507	Trigger lever pin
9509	Trigger/Trigger spring lever pivot pin
9510	Safety bolt plunger
9522	Sear pin
9551	Safety lever or set plate screw
9589	Safety bolt plunger spring
9720	Rearsight blade
9783	Hammer
- - -	Cylinder end unit
- - -	Cylinder end seal
- - -	Rearsight unit

TRIGGER ADJUSTMENT

My trigger pull was very sweet, right out of the box, so I left it alone. It has no creep and was factory set to a light weight. I didn't want to "fix" something that wasn't broken so I don't have much information on this topic.

I have the Weihrauch manual for the HW45 so I can tell you what it says.

The screw at the top of the trigger (closest to barrel) is for "adjustment of trigger slack". For "shorter, turn to right". For "longer, turn to left".

The lower screw is for "adjustment of the let off point". For "hard, turn to right". For "soft, turn to left".

Screw turning directions are **not** given according to the clock. A bit strange.

There is a third adjustment screw that can be seen when you remove a grip panel. This screw is not mentioned in the manual. This screw goes up through the bottom of the centre bar in the grip frame and appears to be the pull weight adjustment. It's a small allen screw and mine extends past the top of this bar by 1/8".

I just checked my HW45 trigger and it has 3/16" of take up (trigger slack) and breaks at 2 lb 7.2 oz according to my digital postal scale. I used the "lift method" to test pull weight.

SHOOTING CHARACTERISTICS

Many shooters become unhappy with the shooting behaviour of the HW45 pistol. The pistol does recoil and requires a special approach for top accuracy potential. Ignoring the recoil behaviour will often lead to frustrations.

I spent some time testing the POI change with the HW45 using grip pressure changes. All my shooting was done indoors from 10 meters using an offhand isosceles hold. All the 10 shot groups were measured center-to-center.

The first group was shot using a firm hold on the pistol. This is the type of hold used on a real powder burning .45ACP. A firm, controlling grip. The group printed low on the bullseye and formed a 1 5/16"ctc group.

The second group was shot with a moderate hold. The pistol's grip was firmly pushed into the web of my right hand and the fingers were wrapped loosely around the front of the grip. The group measured 1 3/8"ctc. The POI was 3/4" higher than the firm hold group.

The last group was shot with a very loose hold on the pistol. The backstrap on the grip was barely touching my hand. My fingers were loosely wrapped around the front of the grip and the pressure was not even enough to fully compress the pads on my fingers. The group measurement was1 1/4"ctc. When using this type of hold the POI shifted upwards 2 1/4" from the moderate hold grip.

I am right handed and I grip a pistol with my right hand. With all these groups my left hand was loosely wrapped around my right with the index finger supporting under the trigger guard. An isosceles stance was used.

The POI changes show that this gun is hold sensitive but with practice and consistency the groups can be reasonable. The groups shot with each hold type were all very close in size. A new set of groups might switch the small differences (offhand shooting).

For most of my shooting I prefer to use a moderate hold on this pistol. If I squeeze a bit too tight the POI only drops a little bit. With a loose hold the pistol practically floats in the hands and I don't like the way that feels and if you accidentally tighten your hold the POI changes drastically. With the moderate hold I can usually cluster my groups close together at 10 metres and the POI is quite consistent.

Everyone must find what works best for them. The above method is my choice.

Once again accuracy with this springer pistol is very acceptable.

TEMPERATURE SENSITIVITY ISSUE

This part of my review was constructed like a diary. This approach shows all the chronological steps I took when battling the temperature sensitivity issue. Hopefully you find it useful or interesting.

Sept 5, 2003

My .22 caliber HW45 velocity testing is finally over. My last batch of tests involved disassembling the pistol several times to change seals, springs, and spring guide direction. I learned a lot and as always I freely and gladly share all the information.

My .22 caliber HW45 had around 2500 shots through it when I starting using 14.5 gr RWS Super-H-Point pellets. I found this pellet to be very accurate and locally available. All my velocity-vs-temperature testing was recorded with this pellet.

At 68 - 70F temperatures the velocity was checked many times and found to be 430 fps. When slightly cooler temps arrived I found a noticeable drop in the velocity. This spurred the interest to do a velocity-versus-temperature test for this pistol.

My basement is usually my indoor shooting area and the ambient temperature during the winter months can be easily controlled. If I prevent the furnace from blowing warm air into this area, I can drop temps to as low as 55F.

I started my cold test by dropping the temp to 58 - 60F for several hours. The pistol's velocity was found to be 360 - 370 fps at this level. I repeated this test many times and always came up with similar velocities. I wondered how bad things would get so I put my HW45 into the fridge for about 20 minutes. This caused velocity to drop to around 350 fps. Once again I repeated the test several times. Even a slight drop to 64F would result in at least 10-15 fps drop in velocity. Every time the pistol warmed up to 70F the velocity would return to 430 fps.

My first suspect was the breech seal. The same type of temperature testing was done with new breech seals and also with shimmed breech seals. The dropping velocity results were the same. The breech seal was obviously not the problem.

The next suspect was the internal lubricants. A complete disassembly, cleaning, and light moly lube tune was done on the pistol. The velocity test results did not change. I even tried adding a few drops of pure silicon oil on the spring to lighten up the lubricant mixture. After many break-in shots I still had no change in cold temperature performance.

Finally I ordered a new mainspring and two piston seals. I replaced the mainspring and velocity increased by 5 fps at 70F, but when I put the pistol in the fridge I would get the same drastic drop in velocity. I can live with maybe a 25 fps drop with a gun that came out of a 45 - 48F fridge but loosing 80 fps is unacceptable.

The next step was to replace the piston seal. Removing the original factory seal was an easy task but damage to the seal was inevitable. The new seal went on with a firm push and a couple of taps from a urethane mallet to seat it. The same lube was applied during re-assembly. I shot over 60 pellets to break-in the seal and distribute the lube. At 70F I was only getting an average velocity of 404 fps.

A 5 pellets series went: 405, 408, 404, 400, 404 fps. I was now totally confused.

I disassembled the HW45 and closely looked things over. I noticed the piston body had a couple of shiny polished marks on the bottom and one on the top. I grabbed my vernier caliper and locked the jaws to the piston seal diameter. I then put the jaws around the piston and rolled the tube to check for tight spots. Sure enough the shiny spots were very tight. The other areas on the piston has a few thou clearance but these spots were galling. Okay, maybe now I found the problem. I tried to polish the piston by hand but quickly discovered the body was hardened. I ended up using my Dremel tool and a hard stone to remove a slight trace of metal from the polished areas. The piston was then chucked into a drill using a 3/4" rubber sanding drum inserted into the hollow end. I spun the piston and carefully polished the exterior with 50 - 80 - 150 - 240 - 320 grit paper. It was now shiny, smooth, and circular.

Everything was re-assembled again and lubed as before. Many pellets were shot to bring the gun to a settled state. Velocity was checked and NO CHANGE! I thought I would at least pick up the 25 fps that I lost with the new seal at 70F.

The thinking cap went back on. Maybe the new piston seal is too wide and the increased friction is what caused the velocity drop. I was now more concerned about getting back 430 fps at 70F. If I had to live with a warm weather pistol then I might as well have the maximum velocity. The new seal caused velocity to drop 25 fps so maybe it was too tight.

I disassembled the pistol and cleaned all the lube off the piston. I used the drum sander to spin the piston and slowly polish the sides of the seal with 600 grit paper. The diameter was compared with the last spare seal I had sitting on my bench. The polished seal started out wider but now seemed to have the same diameter as the unused seal. According to my measurements the polished seal was true and the edges were crisp. I installed the piston with proper lubes and re-tested. Velocity was 395 - 401 fps after a few dozen shots. Oh boy.

All I had left to do was install the last spare piston seal. The procedure was done and the last seal was installed. Velocity was tested and it climbed to 415 fps.

My final test was to reverse the spring guide like a few P-1 owners are now doing. It was a simple task that only required a very small amount of metal to be removed from the disc end of the guide. The gun felt very different when shot with the guide installed this way. The solid "thunk" feeling was gone. It's hard to describe but I could tell things were different inside. I didn't like the way it felt but I chronied it anyway. Velocity dropped to 386 - 395fps. I added a

few drops of silicon oil and shot many pellets to spread the lube. Final velocity was tested at: 400, 405, 403, 401, 406 fps = Ave 403 fps. I lost 12 fps from when the guide was in the factory installed position!

I switched the guide back, the way it came from the factory. Velocity returned and my readings were: 417, 416, 415, 419, 418 fps = Ave 417 fps.

I applied a few drops of pure silicon oil to the spring and shot for a bit to help distribute the stuff. I was tired by now so I put the pistol away for the day.

The next day I decided to do the cold temperature test again so I first shot a series of pellets at 68F and accidentally cut my breech seal with an unseated pellet. I have several spares so I popped one in. The (new warm seal) 68F test went: 421, 421, 422, 424, 420 fps = Ave 422 fps, Energy = 5.74 fpe

The pistol then went into the fridge for 20 minutes at 48F (checked). Velocity was tested immediately after it was removed. Results were: 394, 398, 400, 395, 399 fps = Ave 397 fps, Energy = 5.08 fpe

I only lost 5.9% velocity with a 20F drop in temperature. That's not too bad considering I was loosing 16 – 18% when the gun had all the original parts. I can live with that.

The piston seal seems to be the big factor with the P-1/HW45. The seal fit seems to play a large roll in velocity and temperature sensitivity.

During my testing with the HW45 I asked a few other HW45/P-1 owners to do the cold weather (fridge) test. The results were varied. One .20 caliber shooter had a decrease in velocity of 25 fps when going from 75F to 62F temps. A .177 caliber shooter had no change in velocity. Another .177 caliber shooter had an increase of 20 fps when his pistol was refrigerated. One shooter's .22 caliber pistol had no change when refrigerated but in a later test he lost 25 fps. My pistol had a decrease of 25 fps when refrigerated. There seems to be a lot of variation between test results. Is it the lube, piston seal, breech seal, mainspring? What causes one pistol to shoot faster than another? What causes the velocity change with temperature changes? I think the piston seal has the greatest influence on the velocity situation, but that's only my opinion/guess.

Sept 7, 2003

I ran another HW45 velocity check at 68F.

Beeman FTS	14.5 gr	424, 425, 428, 426, 425	Ave = 426 fps
RWS SHP	14.5 gr	427, 428, 427, 427, 425	Ave = 427 fps

This computes to 5.87 fpe. This was the same as I was getting with my original factory spring and seal at 68F. I'm happy.

Sept 10, 2003

Accuracy had to be tested so I shot 8 targets from 10 meters. All groups were 5 shots offhand and measured center-to-center. It has been a while since I shot targets but I still did okay.

1.3", .85", 1.35", 1.15", .9", .7", 1.1", .85"	Ave = 1.03" ctc

This is the same decent accuracy as I was getting with the old components.

Offhand accuracy tested again a few weeks later.

1.0", 1.0", 1.0", 0.80", 0.75"	Ave = 0.9" ctc

Sept 21, 2003

Here is a bit more velocity comparison data for my .22 caliber HW45. Things seem to be much better with the new piston seal, new mainspring, and polished piston.

With the original parts my .22 HW45 would shoot 14.5 gr RWS Super-H-Points at the following average velocities.

@70F	430 fps
@66F	410 fps
@60F	370 fps
@48F	340 - 350 fps

With 14.5 gr Beeman FTS I was getting an average of 426 fps at 69/70F temps. Velocities with FTS are only 2 - 4 fps less than the Super-H-Point. Variations in actual pellet weights between tins or friction differences are likely the reasons.

The piston body was polished to eliminate the three small zero tolerance spots that were rubbing inside the tube (described above). The piston was very slightly out of round but was corrected with

spinning the piston and using emery paper (50 - 80 - 150 - 240 - 320 grit). A new piston seal and mainspring were installed and a break-in period of approximately 500 pellets was completed.

New results with 14.5 gr Beeman FTS pellets.

@68F	425 fps	425, 427, 424, 424, 426
@65F	423 fps	422, 424, 423, 422, 426
@56F	412 fps	413, 411, 414, 412, 411
@48F	397 fps (Super-H-Point)	

Jan 31, 2004

I have not tested anything for a while and was getting a bit bored. Last night I left my HW45 in a room in my house in which I turned the heat off. I placed a thermometer in the room and it said 50F. The gun sat at that temp for many hours. I tested velocity. Velocity was also later tested at 68F and 70F. The average velocity with 14.5gr FTS were:

50F	395 fps	5.02 fpe
68F	422 fps	5.74 fpe
70F	418 fps	5.63 fpe

This new Weihrauch spring now has about 1400 pellets on it. The piston seal has maybe 1600. I had a bad feeling the velocity would drop down to the 350s but it seems to be holding close to 400 fps in cold temps (48 - 50F). Nothing has changed since I tested this spring when it was first installed. That's good news!

My HW45 velocity seems to peak at 68F. I guess the piston seal likes that temp for some reason. The velocity difference between 68F and 70 - 72F is very small but always there.

The Beeman web site shows an energy rating of 5.1 fpe for the P-1 (.177&.20). I almost get 5.1 fpe at 50F. I would get that reading at around 55F (I would need only 399 fps with 14.5 gr).

Conclusions

With the original parts I was loosing 5 to 6 fps per degree of temperature drop (70F-60F). With the new parts I am now loosing only 1 fps per degree.

The velocity at 48F with the new seal is noticeably higher with than what I was getting with the old parts at 60F (397 fps vs 370 fps). With both seals compared (new/old) at 48F, I am now getting approximately 50 fps more velocity.

The temperature sensitivity grief with the HW45/P-1 pistols seems to be related to the piston seal. I don't know weather a slightly tighter or looser fit is best, or maybe some seals are just rounder or more pliable. We can only guess at the reason for the velocity improvement and differences.

HW45 SHOOTING STORIES

For a final section I have a few HW45 shooting sessions which I carefully documented. These stories will give an idea of the accuracy potential of this spring pistol.

July 9, 2003

Offhand Shooting
My .22 caliber Weihrauch HW45 currently wears a Millet SP-1 red dot sight. The dot size is 3 moa and it works great for smaller targets. I like the feel of the pistol with this sight. The total weight is 2 lbs 14.2 oz and the balance point is inside the trigger guard. This pistol is sighted for a center hit at 10 meters.

This afternoon I did some long distance plinking with my HW45. All shooting was done offhand using an isosceles hold. All shooting was with 14.5 gr RWS Super-H-Point pellets with an average velocity of 430 fps.

The distances were measured with a 100 foot tape to make sure everything was correct, no estimates. Tin cans were placed at each distance.

Targets	
10oz Campbell's Soup can	2.7"D x 3.9"H
14oz Bean can	3.0"D x 4.4"H
22oz Pasta Sauce can	3.4"D x 5.7"H
28oz Tomato can	4.0"D x 4.7"H
2.2lb Coffee can	6.1"D x 6.3"H

Shooting Results
15 yards - Campbell's Soup Cans
- made 5/5 hits
- aimed at center of can
- had penetration through one side and often both sides of can

20 yards - Bean cans
- 5/5 hits
- aimed at center of can
- penetration through one side of can

25 yards - Pasta Sauce cans
- 5/5 hits
- aimed a little lower than the top of can and hit center of can
- can dents but no penetration. The can always rolls/flips over

30 yards - Tomato cans
- 3/5 hits on first try and 5/5 hits on second try
- aimed at top of can for hits
- sometimes a slot is ripped in can. Less than 1/2 the time the can flips over

35 yards - Coffee Can
- 4/5 hits. Shot a 6th pellet and hit can
- aimed approx 2" above can
- can doesn't move. Pellet makes a dent just below middle of can

40 yards - Coffee can
- 4/5 hits on first try. Shot 6th pellet and hit can
- at end of shooting session I tried again and did 3/5 and 4/5
- aimed one can height above can
- mild dents in can just below center

45 yards - Coffee Can
- this is stretching things! Pellets lob at the target at this distance
- 4/5 hits on can. Shot 6th pellet and hit can
- aimed 1.5 can heights above can to hit
- very mild dent in can when hit

50 yards - Coffee Can
- 2/5 hits. Too far to be accurate

Using the red dot sight on the HW45 really helps with long distance shooting. Estimating hold-over is a lot easier with the dot.

I used the #8 intensity level when shooting outside with the Millet dot sight. The sight has 11 levels. For dimmer indoor shooting the #2 or #3 level is fine.

June 29, 2004

Offhand Shooting

The day was warm so I decided to do some long distance plinking in the beautiful country. My initial plan was to shoot both the HW40 and HW45 but I ended up shooting over 200 pellets through the HW45 and ran out of time.

My .22 caliber HW45 still wears a Millet SP-1 red dot, secured with Kwik-Site mounts. The red dot helps with long distance aiming and holdover estimations. I like the dot sight because it doesn't magnify my wobble.

The day was very bright so intensity setting number 8 was used on the Millet. This red dot has 11 intensity levels to choose from and I always opt for the lowest possible setting for the available lighting. Setting number 3 works fine for indoor shooting.

Beeman FTS pellets were used for all of today's shooting. This pellet is also known as the H&N Field & Target Trophy. The RWS Super-H-Point is another accurate shooter in this pistol but I did the bulk of today's plinking with the 14.5 gr FTS. Both of these pellets currently shoot approximately 420 fps from this pistol.

All distances were measured with a 100 foot tape. All shooting was offhand using an isosceles hold.

Targets	
Campbell's Soup Can (10 oz - 284 ml)	2.7"Dia. x 3.9"H
Heinz Bean Can (14 oz - 398 ml)	3.0"Dia. x 4.4"H
Hunt's Pasta Sauce Can (22 oz - 680 ml)	3.4"Dia. x 5.7"H
Large Coffee Can (1 kg - 2.2 lbs)	6.1"Dia. x 6.3"H

Shooting Results		
20 yds	Campbell's Soup Can	9/10 hits + 10/10 hits
25 yds	Heinz Bean Can	10/10 hits + 8/10 hits
30 yds	Hunts Sauce Can	8/10 hits + 10/10 hits
40 yds	Large Coffee Can	8/10 hits + 8/10 hits
40 yds	Hunt's Sauce Can	6/10 hits + 5/10 hits + 6/10 hits

Penetration

20 yards - usually penetration through both sides of can
- can flips over

25 yards - usually a slot is ripped through one side of can
- can falls over

30 yards - a deep dent in can
- can falls over if hit solidly

40 yards - Coffee can does not fall over
- Hunt's can will often fall over if hit solidly

Notes

- took several sighter shots prior to scoring at each distance
- there was a slight breeze when shooting but nothing terrible
- all measurements were double checked prior to leaving the shooting area
- all shooting was carefully documented

June 18, 2003

Offhand Shooting
I always seem to do my best offhand shooting late at night, when most normal people are sleeping. I guess I relax more at night and have less wobble.

The distance was 10 meters and the official 10m AP target was used. All shooting was with an offhand two handed isosceles hold. I used the RWS Super-H-Point pellets for all 5 shot groups. A generic Pledge spray wax was used as a pellet lube.

All groups were measured center-to-center with the points on a vernier caliper, and rounded to the nearest hundredth. Groups, in order, were:

Group #1	0.82"
Group #2	0.94"
Group #3	0.66"
Group #4	0.68"
Group #5	0.60"

Average group size was 0.74" ctc. That's a Personal Best with a springer pistol at 10 meters! I can't believe it! I usually manage 1.0” at this distance.

Offhand Shooting @10 metres (5 shot groups)

June 2004

Offhand Shooting

Shooting a P-1/HW45 from a sandbag rest is an exercise in frustration. The recoiling pistol doesn't seem to perform at it's best when held in a rest so I decided to shoot several offhand groups (isosceles hold) using the Millet red dot.

Offhand accuracy @20 yards (5 shots)		
Beeman FTS	1.80, 1.65, 1.85, 1.40, 1.80	Ave = 1.7" ctc
Super-H-Point	2.00, 1.70, 1.40, 2.00, 1.95	Ave = 1.8" ctc

I then shot 8 more groups with the FTS.

1.35, 1.60, 2.30, 2.90, 1.45, 1.25, 1.00, 1.65	Ave = 1.7" ctc

I obviously had a couple of flyers that were my fault. The groups show the results.

This was one of my best offhand shooting sessions with the HW45. When I do my part the pistol performs quite well and I have no doubt the HW45 is capable of sub 1" groups at 20 yards (5 shots). If I didn't have the targets in front of me I would never had though the HW45 was as accurate as it is.

Red Dot Versus Iron Sights

During June 2003 I did some 20 yard offhand group shooting using only my iron sights. The 5 shot groups were fairly reasonable although not as small as with the red dot mounted.

Offhand accuracy @20 yards (5 shots, iron sights)		
Super-H-Point	2.55, 2.35, 2.35, 2.45	Ave = 2.4" ctc

With iron sights I managed to average 2.4” and with the red dot I did 1.8” with RWS Super-H-Point pellets. I reduced my groups by 25% by using the dot sight.

FREQUENTLY ASKED QUESTIONS

Q- Why does my P-1 rattle when I shake it?
A- The two cocking arms move in the slots when you shake the pistol. Not a problem.

Q- Why does my P-1 shoot slower than what other owners claim?
A- Possible breech seal damage. Sometimes velocity can be increased with a piston seal or mainspring change. Proper lubrication also helps. Some barrels might be tighter. There will always exist some velocity differences from pistol to pistol, as with rifles.

Q- Does the P-1 need to be oiled on the outside.
A- The P-1/HW45 outer frame is made from a non-rusting alloy. Wipe off any handprints or grime with a soft, dry cloth.

Q- Can I change calibers?
A- A new barrel can be ordered to change to .177, .20 or .22 calibers. The two barrel strap screws are often very tight and finding the proper size allen wrench can be a challenge.

Q- Is the Beeman P-1 better than the Weihrauch HW45?
A- No, it's the same pistol. Same velocity, same accuracy.

Q- Is the HW45 difficult to disassemble?
A- A spring compressor is recommended. The pistol is not simple to disassemble, but it's not very confusing either. Go slowly and use the instructions in the review.

Q- Is the P-1/HW45 difficult to shoot accurately?
A- Once you learn to shoot a spring-piston pistol, the HW45 accuracy is very good.

Q- Is the P-1/HW45 powerful enough for hunting?
A- The muzzle energy is approximately 5.2 to 6.0 fpe, depending on caliber and pistol. Accuracy is generally more difficult to achieve with a pistol versus a rifle. That's all I'll say.