

Technical Details for Adjusting the BAM B50/51

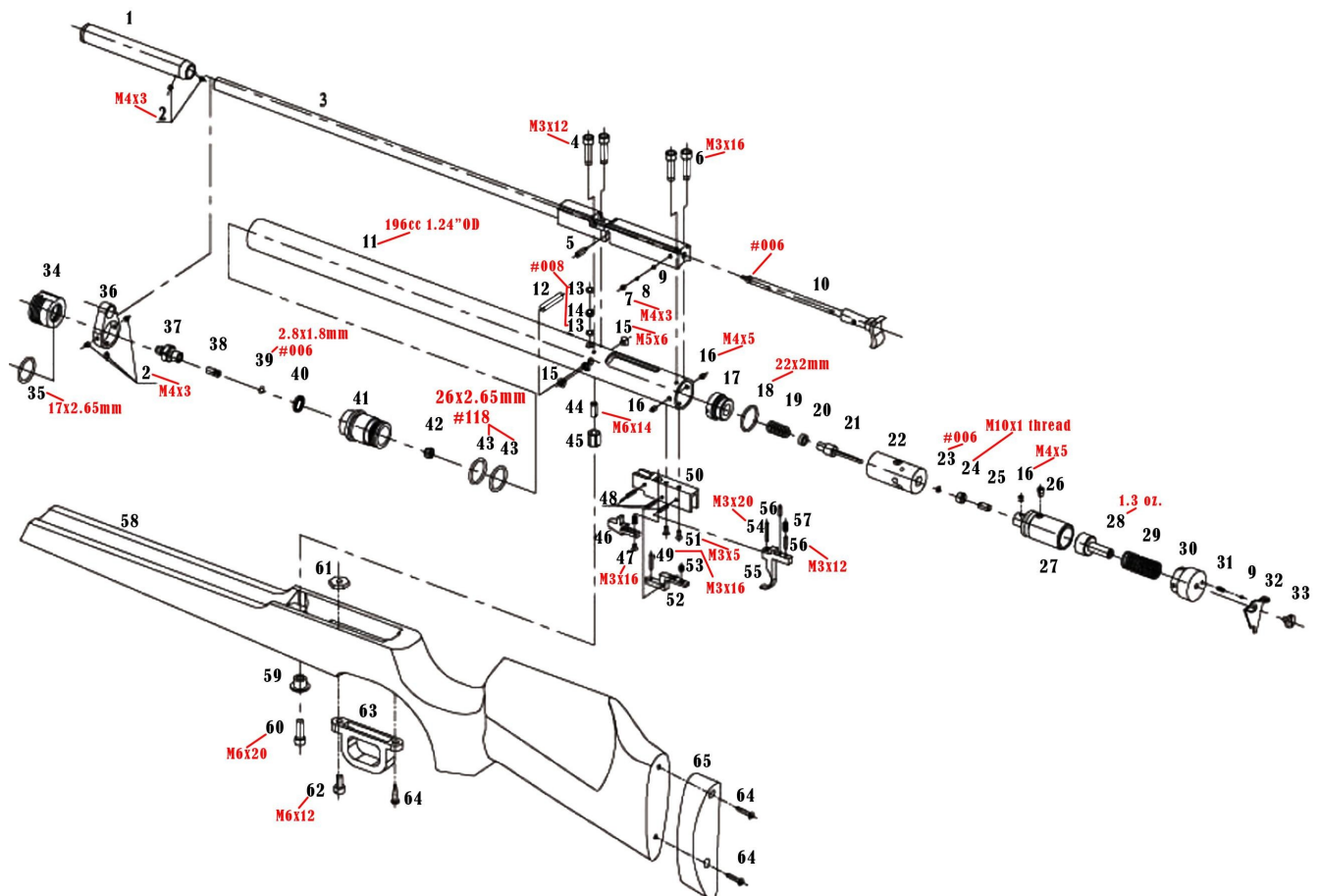
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Special thanks to Rich (Login RLT58), JohnB (Login spysir), CVanMeter (Login CVanMeter), Dick Otten (Login DickOtten), Esl dude (Login esldude), Daily Grind (Login DAILYGRIND), L.E. (Select Login TPlant2000), Michael (Login grammerman), Dan in MI (Login VWDan), Biged618 (Login Biged618), gregc107 (Login gregc107), Checkmarks (Login Checkmarks), Glover, Walter (Login Voltar1), scot laughlin (Login clasicalgas), Randy Mitchell (Premier Login rk Mitchell), DACKerson (Login donack456), Tim McMurray (Login Mac-1), dino_g (Login dino_g), Ora (Login ora8i), Steve in NC (Login pneuguy), Fred Bingham, Rhoderman (Login Rhoderman), Johnny (Login JohnnyFFFF), Sniper (Login sonic07), Malan (Login malan128), Keyrigger (Login keyrigger), JOE (Login Joez52), wvanryper (Login wvanryper) from the Chinese Airgun Forum <http://www.network54.com/Forum/113813/> and Yellow Forum <http://www.network54.com/Forum/79537/>



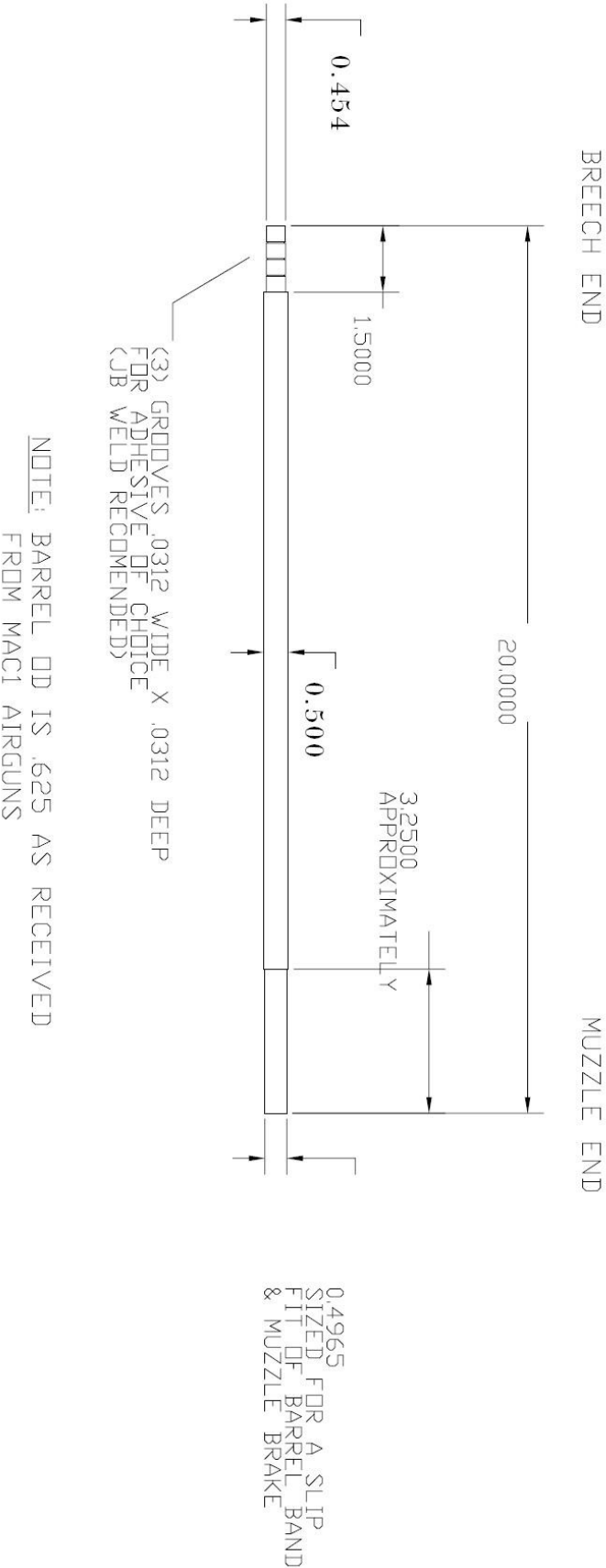
Specifications

Caliber	FPS	Overall Length	Barrel Length	Weight	Accuracy
.177"	1,000	43.1"	18.5"	8.0 lb	1/4"/10m



No.	Code name	Name	No.	Code name	Name
1	B50-01-00	Muzzle end	34	B50-00-7	Cylinder end cap
2	GB77-85-M4×3	Muzzle end screw	35	GB3452.1-82-17×2.65	"O" ring
3	B50-02-100[B]	Barrel combing	36	B50-00-1	Cylinder clamp
4	GB70-85-M3×12	Screw	37	B50-03-1	Male snap connector
5	B50-00-3	Pin	38	B50-03-2	Valve
6	GB70-85-M3×16	Screw	39	GB3452.1-82-2.8×1.8	"O" ring
7	GB/T80-1985-M4×3	Screw	40	B50-03-100[B]	Washer
8	B50-02-1	Steel ball spring	41	B50-03-3	Male snap connector seat
9	GB/T308-1989 3	Steel ball	42	B50-03-200	Filter
10	B50-04-00	Loading bolt combing	43	GB3452.1-82-	"O" ring
11	B50-03-4	Cylinder tube	44	GB73-76-M6×14	Screw
12	B50-03-5	Link pin	45	B50-00-11	Nut
13	GB3452.1-82-4.5×1.8	"O" ring	46	B50-00-13[B]	Sear
14	B50-00-2	Bush	47	GB819-85-M3×16	Screw
15	GB819-85-M5×6	Screw	48	B50-00-14	Sear pin
16	GB77-85-M4×5	Screw	49	GB77-85-M3×16	Screw
17	B50-03-14	Main spring seat	50	B50-00-5	Trigger chassis
18	GB3452.1-82-	"O" ring	51	GB819-85-M3×5	Screw
19	B50-03-15[B]	Firing valve spring	52	B50-00-15[B]	Trigger lever
20	B50-03-13	Firing valve bush (front)	53	B50-00-4	Trigger lever spring
21	B50-03-500[B]	Firing valve	54	GB77-85-M3×20	Screw
22	B50-03-16[B]	Firing valve body	55	B50-00-16	Trigger
23	GB3452.1-82-	"O" ring	56	GB77-85-M3×12	Screw
24	B50-03-17	Firing valve bush (rear)	57	B50-00-6	Trigger spring
25	B50-03-18	Striker guide rod	58	B50-05-1	Stock
26	B50-03-6	Striker pin	59	B50-00-12	Stock screw washer
27	B50-03-19	Striker	60	GB70-85-M6×20	Screw
28	B50-03-7	Main spring seat	61	GB6172-86-M6	Nut
29	B50-03-8[B]	Main spring	62	GB65-85-M6×12	Screw
30	B50-03-9	Cylinder seat	63	B20-00-13	Trigger guard
31	B50-00-8	Safety spring	64	GB100-86-3.5×20	Screw
32	B50-00-9	Safety	65	B50-05-100	Butt pad
33	B50-00-10	Screw			

Barrel Dimensions



I've found a 29/64" reamer works very well for cleaning out the glue and crud from the receiver. That's 0.453", plus a little.

Also, the 1.5000 dimension should be "to fit" when you're trying to match the breech. If you get it perfect, you will have no gap at the barrel to breech seam, and the back end of the barrel will have no gap to the reduced bore in the breech.

Jim

air cylinder size

196cc, 1.240 (31.5mm) O.D.

spring tophat weight

1.3 ounces (38 grams)

hammer/striker weight

3.9 ounces (112.5 grams)

factory barrel and breech without bolt

24.2 ounces (~1.5 pounds)

HW barrel weight – 24 inch – not fitted to breech

16mm - .177 = 32 ounces (2 pounds)

16mm - .22 = 30.7 ounces (1.9 pounds)

transfer port o-ring

AS568A Dash No.#008 3/16"× 5/16" 0.176"×0.316"

bolt, pellet probe

AS568A Dash No.#006 1/8"×1/4" 0.114"×0.254"

firing valve bonnet thread

M10 x 1

firing valve o-ring seal

22x2mm

Before we begin:

Just wanted to remind you all about safety.. 😊

Very close call with my BAM 50 this evening...

I recently bought a B50 and have spent the past couple of evenings taking it apart, checking it out and cleaning it up. I had the gun all the way apart with the exception of removing the valve from the cylinder.

After thinking about it, I decided it was probably not worth the trouble to take the valve out (figured I would end up messing something up, and besides, it wasn't leaking or anything).

So, I put the end cap back on and snugged it down. I thought I would put a small amount of air into the tube to check for leaks. I connected it and started filling. I was going to go to 1000psi but at about 800, I heard a loud BOOM! and there were piece of a closet door flying all over the place.

I sat stunned for a second trying to figure out just what had happened, then it hit me - I never put the screws or pin back in that hold the valve in place! The whole valve assembly shot out of the end of the cylinder, through a hollow closet door, into a wall, bounced off another door, coming to rest on the other side of the room.

Luckily, and I mean luckily, my son was not in the room with me and I was holding the cylinder away from me while filling... So, no bodily damage, but a closet door to replace!

Lesson for the day? Pay attention to what you are doing!



Removing barrel from B50/51

Finally I got some time to work on the new set of receiver and barrel of my B51 .177, the original is still on the gun. This new one doesn't have marking on the side of it, it's just plain black.

I used 6mm cheap drill bit (5.80mm) with the back end went in first from the back of the receiver. 5.8mm is the opening of the breech on the barrel. I used 2x4 spruce and drilled 1/2" hole for the barrel to go in and held the receiver in place.

Heat it up with a propane torch about 2-3 minutes from the bottom of the receiver, two blows with 16oz hammer and there goes the barrel out of the receiver wow.... am I happy to see that.

Amazing NO damage or discolor on the barrel nor the receiver. clean out the left over burned up glue with 3M stripping pads (fake steel wool) inside the receiver and the barrelNICE...results.

NOW this baby is ready for .22 HW barrel





Removing barrel from B50/51 – Another method

I rigged up a simple jacking screw and used a heat gun to soften the glue.

The 1/2" Aluminum plates are 3" x 1-13/16". I milled the edges so they were exactly the same size then put a 1/16" shim between them and drilled the 1/2" hole in a 4 jaw chuck in the lathe. I used brass for a shim but I should have used Aluminum and milled it to size with the plates. The drill wanted to grab the brass and the void where there was no shim. No particular formula for plate size just something you can clamp in a good vise with relief so the Aluminum get a good bite on the barrel.

The rod is 3" long with a 17/32" hole, 7/8"-14tpi (cut from McMaster Carr #98791A037). Sleeve nut is #90264A255. The Aluminum washer was made from some rod I had.

I used a 750 deg Master heat gun I bought years ago for stripping lead paint. The barrel came off very easily and smoothly with little turning torque.

One thing about the Aluminum clamping plates, rather than the machining as I mentioned you could drill the 1/2" hole in a thicker plate (7/8" or 1") and split it with a bandsaw. You also could probably use smaller plates as my original idea was to use bolts to clamp the plates to the barrel; so my plates shown had enough space for 6 ea. 5/16" clamping bolts. The bandsaw cut would give adequate relief and eliminate the need for a lathe.

JOE





B50 / 51 Warning - Screw #26

I had known that screw #26 (guide for the hammer) was tight from the time the rifle was received. I didn't realize the future problem and possible danger.

The hammer jammed in the cocked position. Oh Joy! The hammer won't release and won't come back any farther. It is stuck big time.

I wasn't thrilled about it, but I removed the barrel and pulled the cylinder seat and took the pressure off the spring.

Unscrewed #26 and the hammer slide freely. Removed the hammer and tried to slide #26 inverted with my fingers. No go. Cleaned up the guide in the receiver with a Swiss file and chucked up the screw in a hand drill and filed the OD of the screw head. I can slide the head in the slot by hand now.

Check for this possible problem when you have your rifle disassembled.

Screw #26 removal

For observation, throw out part #26 'Striker Pin' (screw in top of hammer) and you can remove and adjust striker length without removing the breech/barrel. With out that screw I can pull/adjust/reinstall in 120 seconds if pressed to do so. So far Rich is the only person who has offered any idea on why that screw is there in the first place.

Screw #26 real use and a mod

Drill and tap a hole 180 degrees for Set Screw #16 from Screw #26 and drill a hole into the receiver in front of the trigger. No need to remove the barrel, just the stock.

Screw #26 for the adjustable power mod

If you take screw #26 out, the hammer will rotate during the shot cycle. This will lose the positioning of the lock screw #16 for the striker guide rod #25. I would turn down the head of screw #26 so that it doesn't jam.

If you are removing the striker assembly (hammer) like JohnB, then you can remove screw #26. Also, removing screw #26 will allow the hammer to rotate freely and even out the wear.

How to adjust B50 power

How to adjust B50 power:

This is the way I did it without cutting or grinding anything.

If you don't strip anything, you should be able to get back to your factory settings in a few tries.

This may not be the best way to change fpe, there may be many ways that are better. If you do decide to use this info, just keep in mind that this is my first PCP rifle and I'm really a microwave antenna guy!

1. Make sure the gun is unloaded/Safe.
2. Remove the muzzle brake.
3. Remove the 4 screws on top of the Breech Block.
(The two screw in the rear are longer than the two forward).
4. Lift the Breech Block 1/8" and pull it to the rear to remove Block & Barrel.
(Don't lose the (13) O-ring on top of the (14) Port Bushing).



5. Use the Hex wrench from your kit to remove the (16) Striker Adjuster Lock Screw.



6. Place a small piece of soft metal (copper worked) inside the screw hole and replace the screw.
(This will keep the locking screw from bugging up the (25) Striker guide rod).

7. With the (16) lock screw loose, reach in and turn the (25) Striker guide rod) with hemostats.



More Power=CW, IN or Shorter. The Striker moves farther before hitting the (21) firing valve pin.

Less Power=CCW, OUT or Longer. The Striker hits the pin sooner. (less inertia).

8. Tighten the (16) lock screw. Replace (13) O-ring and Breech & Barrel.

9. Chrony and repeat..

Comments:

When I moved the (25) Striker Adjuster Screw IN about 1/4 turn from the factory setting, Ramjets went from 'Factory' 1003fps to 1030fps (200 Bar).

When I ran the (25) Striker Adjuster Screw OUT about .23", Ramjets dropped down to 717fps. (However, that was at 195 Bar (2828 psi) and the shots got faster each time I fired).

I wanted to get about 20fpe out of the Ramjets, so my goal was to shoot them at about 950fps. On my 3rd tweak, I got a 959.3fps average! However, my numbers came out climbing for the first 19 shots (starting at 195bar (2828 psi)). I think this means, I'll have to find a new (lower) fill point and see how many shots I get.

For best ES (Extreme Spread) It sure seems like my B50 likes to shoot Ramjets at 1000fps. Of course the Ramjets don't want to group when going that fast.

So, when my CPH pellets come in (under the tree?) I'll have to check out the velocity and tweak if needed (for 20fpe) and see what the best Bar is..

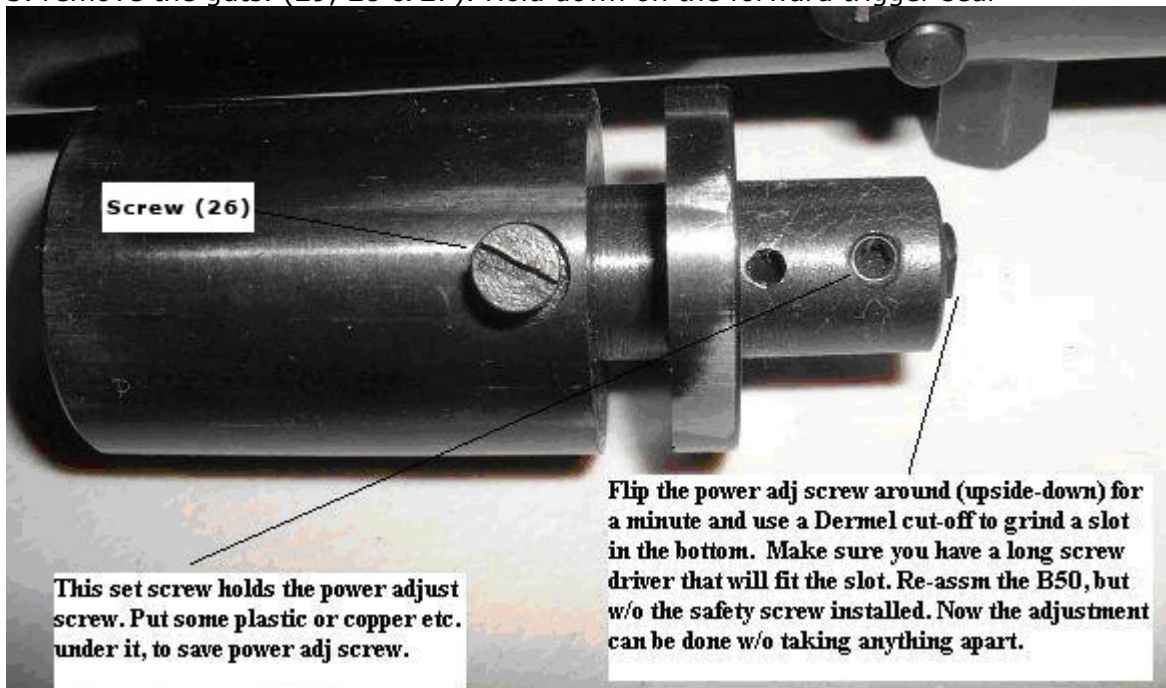
Cheers, Rich

3rd Adjustment: .177 RamJets
 (There were about 4 errors. Skips in the data)
 Lo 903.6
 Hi 1001
 Av 959.3
 Es 97.8!!
 Sd 32.41
 1. 908 (195 Bar)
 2. 908
 3. 903

- 4. 930
 - 5. 936
 - 6. 945
 - 7. 933
 - 8. 953
 - 9. 950 (My target mv)
 - 10 967
 - 11 986
 - 12 967
 - 13 975
 - 14 990
 - 15 989
 - 16 997
 - 17 956
 - 19 1001 (170 Bar left in the tank)
- (At some point, MV has GOT to start dropping off)!

How to adjust B50 power part 2 (advanced hackers only)

1. Read information above.
2. Take breech/barrel off.
3. Take out screw (26)
4. Hold your hand firmly behind the plug (30) and loosen up the set screws on both sides of the (30) plug. (It will fly out from spring pressure).
5. remove the guts. (29, 28 & 27). Hold down on the forward trigger sear



6. Put the power adjust screw (25) Striker Guide Rod in backwards.
7. Put the hammer in a vice (not too tight).
8. Use a thin cut-off wheel to make a slot in (25) power adjust screw- Striker Guide Rod.



9. Flip (25) back like it was and clean up and oil.

10. MAKE SURE you can turn the power adjust screw from the bottom of the hammer. Don't make the set-screw (16) is too tight or too loose.

If it's too loose, you power setting might change while out hunting!

I shoved a wad of Teflon tape under the set screw and it seems to work okay.

12. Put it back together without the safety installed.

WARNING! The tiny ball-bearing (9) will fly off into another room if you are not careful when you take out the safety screw (33).

I've been told that you can just get out the old Chrony and start shooting and tweaking the power with a long screwdriver (screw (33) hole and find that



sweet spot. (Best pressure and velocity for best performance).

Cheers,
Rich

PS:

Here's part of an email: (He's using a plastic spring guide(28) not steel).

Now if you can put a slot with a Dremel cutoff disk in the back of the adjusting screw and build or find a long screw driver you can adjust it from the back thru the safety hole while you shoot over the chrony. make sure the set screw that has the copper under it is tight enough to hold

adjustment but loose enough so you can turn the screw. My gun likes a fill pressure of about 2300 psi it will shoot down to 2000 psi in 45 shots with a 20 fps spread around 880-910 fps which is good for FT. As you can see you needed to push that screw out a long ways to slow the gun down that shortens the stroke and lock time quite a bit did you notice and difference? Using good lite lube did speed my gun up also when everything wears in it will pick up a little speed.

B50 / 51 Hammer Holes :-)

Have you ever looked at a B50 hammer and wondered what the two holes that are drilled behind the nose set screw are for?

Have you ever wanted to take a 900 FPS pellet to 200 FPS instantly? It is easy to do 😊

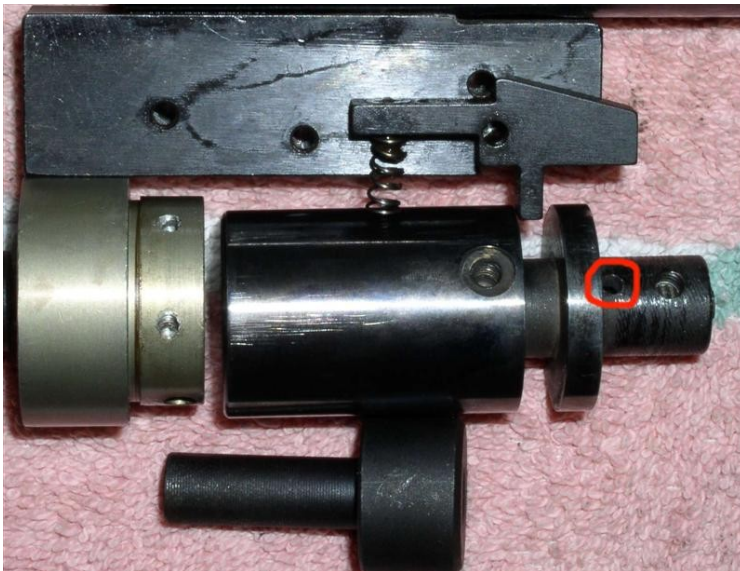
The following are required:

The adjustable hammer screw is screwed back far enough to cover the holes or a tophat without a through center hole. The safety screw hole either plugged with a screw or your finger.

If you lube the hammer OD good, you can even get to the point that the firing valve will not open.

Just more things from the lab! 😊

A vacuum is formed behind the hammer if you haven't guessed.



B50 Test of 2.3mm transfer port with light weight setup.

The light weight setup is a milled out hammer, aluminum spring guide and weaker spring. I'm using the light spring guide, trying off-set any loss in lock-time speed that may be caused by using a weaker (Slower?) hammer spring.

The goal of this configuration is to obtain the maximum number of FT quality shots using only 12 fpe of power.

Using the light weight gear with this new weaker spring did not allow for a smooth hammer-to valve gap power adjustment. The Extreme Spread (ES) became erratic as power was lowered. I suspect the low mass hammer gear needs a larger gap to obtain the full impact power needed to open the valve with 'Authority'.

So, since the screw adjusting wasn't working, I made a new transfer port with a 2.3mm ID to limit the air flow and obtain 12 fpe of power. Note: This port might be too large to effectively cut power

on a stock B50.

Since my normal fill pressure (w/ standard 2.8mm transfer port) was only 1500 PSI (103.42 Bar), I decided to start the Chrony testing with a little over-fill. As a result, the first 10 shots were a little low. These are 32 shot strings to determine the best fill pressure-shot numbers. Chrony was 1 foot from the muzzle. Lubed CPH pellets were used.

#1.

Start 1900 psi (131 Bar). End 1680 psi (115.8 Bar). Used 220 psi (15.17 Bar) for 6.875 psi (.474 Bar) per shot.

lo=683 hi=735.3 av=720.3 es=52.1 sd=10 to=32

#2. (Best)

Start 1680 psi (115.8 Bar) end 1400 psi (96.5 Bar). Used 280 psi (919.3 Bar). 8.75 psi (.603 Bar) per shot.

lo=726.7 hi=743.4 av=736.6 es=16.73 sd=4.47 to=32

#3.

Start 1400 psi (96.5 Bar) end 1100 psi (75.8 Bar). Used 300 psi (20.68 Bar). 9.375 psi (.646 Bar) per shot.

lo=706.2 hi=739 av=725.2 es=32.82 sd=9.79 to=32

Looking at all 96 shots, I can see that 720 fps was reached at shot 11 in string #1 and drops below 720 at shot 25 in string #3. So throwing out the first and last 10 shots, the center 78 shots are the good ones I'm looking for. 😊

Ave air usage for all 96 was 8.33 psi (.574 Bar) per shot.

Ave mv was 727.366 fps. For an Ave 12.326 fpe. (for all 96 shots).

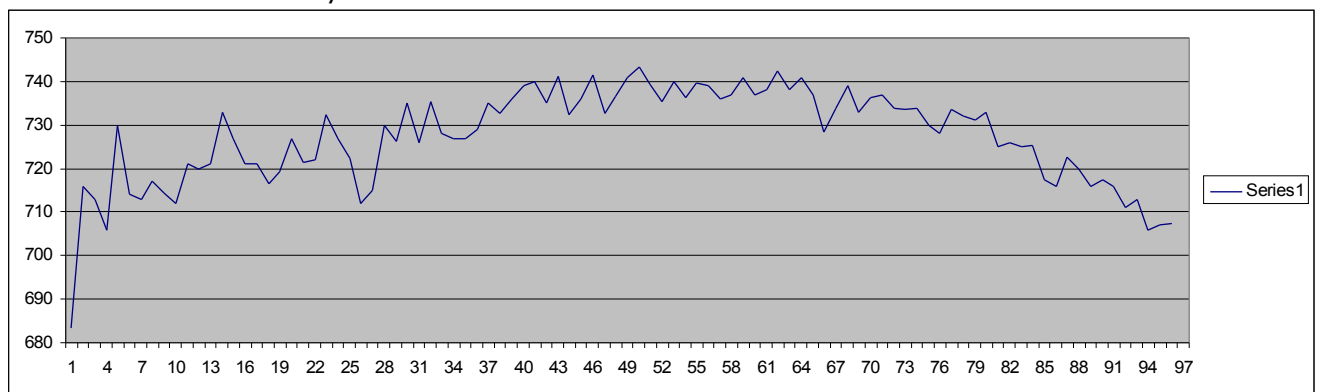
In conclusion, the data indicates that a fill pressure of 1800 psi (124.1 Bar) will yield 70-80 shots with a ES averaging around 20 to 30 fps.

Perhaps the use of a CPLs will lower FPE to slightly under 12 fpe. If not, a very small adjustment to the hammer screw may be needed to reduce the fpe to the desired 11.98 fpe 😊

Overall, I'm pleased with the results.

Cheers,
Rich

Looking at the plot line, it seems like the valve was really working well between shots 37 & 81. Those 44 shots are really the ones that should be used in a match. 😊



Emptying the Air Cylinder

I fire mine till it down to less than 100 psi (6.9 Bar) (There is barely air coming out). Then I back the fill nipple off a tiny bit until I just hear air leaking out there. Set rifle to the side and wait for it to finish dumping the last bits of the charge that was in it.

Check valve vs. Fill valve

The confusion is more from the terminology than anything else.

A true check valve is a one way valve. Stuff goes in, but doesn't come out the same way.

The fill valve in the Bam has a pin and O-ring that seals off the air trying to come out of the air tube.

When you start to pressurize the air tube, you will normally hear a click as the pin is pushed to the open position. At this point the pin is almost free floating. The bottom is resting against the filter basket, but there is no spring to re-seat the pin once the fill has been achieved.

When the bleeder is opened, the air in the tube will push the pin back into the closed position.

That is why you can bleed an entire air tube if necessary. With the pin in the open position, you can turn off the scuba valve and the air pressure is equalized in the hose and gun. If you just crack the bleeder valve, it will slowly let the air out. Not enough air is coming out to push the pin closed. As long as things stay this way, the entire air tube will slowly bleed out. If the bleeder is opened much further, then the rush of air from the tube will carry the pin and start to close off the valve. When the O-ring gets to the valve opening, the air pressure behind will finish pushing the pin to the closed position.

BigEd

Use a brass washer to keep the valve from coming in contact with the filter basket..

It sets between the valve stem and the filter basket. That way there is no way for the valve to get to a point where it can damage the brass filter.

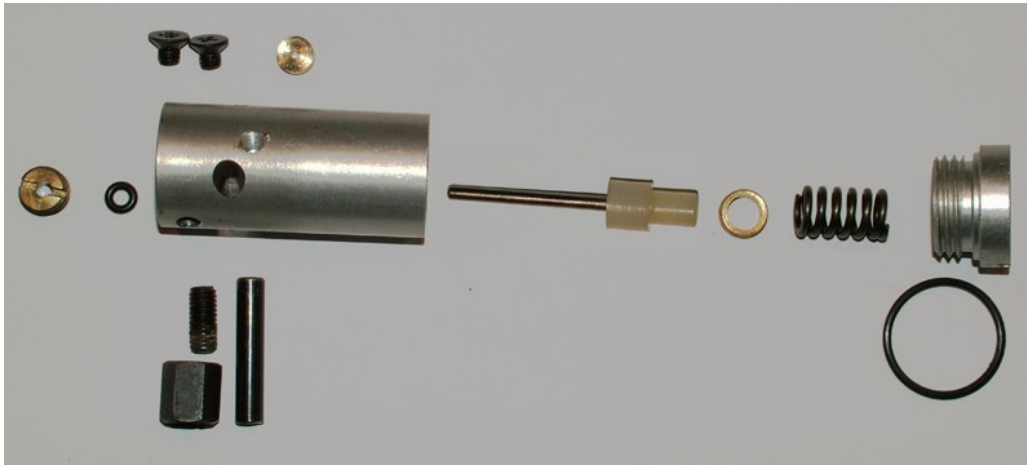
Proper way to remove firing valve

Before you do ANYTHING, make sure the air tube is empty!

The firing valve can be just pushed out after removing the screws and pin, but on the way out it may nick the O-ring because of the cutouts for the cocking and trigger assemblies. The best way is to have an extremely long screw driver. First remove the barrel band, then remove the FILL valve assembly, and unscrew the front of the firing valve at least a half turn. This will take the pressure off the O ring and allow the firing valve to slide out much easier. Now since 18" screwdrivers are somewhat hard to come by, I used 5/16" screw bit in a socket with enough extensions to get to the valve. I learned all this after munching an O ring while trying to get the valve back in from the back side.

To put the valve back in, leave the Front of the valve loose, position the valve in the tube, pin it and screw it, then tighten the valve front which expands the O ring and seals against the tube wall.

Saves the frustration of trying to find a replacement O ring.



I looked for a way to get the valve apart. Sneaky devils..... under the O-ring was not just a groove but a joint where 2 pieces came together. I slowly unscrewed the back of the valve (slowly, because that looked like a stout little spring in there), about half way unscrewed, the pressure eased up on the cap and I finished taking it apart. Behind the cap was the spring, a brass washer on the spring guide, and the front of the nylon spring guide was the actual valve. It seats against the inside of the valve and shuts off air after firing. A sliver of the brass filter had worked it's way between the nylon and aluminum. It had pitted and scratched the nylon, thus breaking the seal and allowing the air in the tube to escape. The scratch was not major, but enough to keep the tube from holding air.

I took a washer that I had stoned smooth and flat and put some 600 wet/dry sandpaper on it. Then I poked the hammer pin through the washer and sandpaper and slowly sanded the nylon flat again. No pits no scratch. Re-assembled the valve and put the B-50 back together. Mission accomplished and problem solved. It now holds air again.

So if your B-50/51 starts hissing at you, chances are that it's the valve, and now you know how to fix it. One caveat.... be careful and work slow. It needs to be flat, smooth, and square. If you mess up the nylon seat/seal, you WILL be looking for spare parts. (Or someone to make you another.)

(**Hint:** when putting the valve back together, screw the aluminum pieces together and roll the o-ring into the slot. The slot needs to be open enough to allow easy insertion of the valve back into the receiver tube.)

Some things about Delrin...

...that maybe you already know, but maybe someone else can benefit.

Primer: Loctite makes a 770 primer that works with regular 401 and other cyanoacrylates. Pretreating the surface can increase the bond strength from something like 500-700 lbs to more like 7000.

Tapping fine threads: Drill an appropriately-sized tap hole for the thread in question. Heat a (steel or brass, something other than plastic) screw with the same thread to 330 degrees F. A little more is OK, but too high will cause problems. Screw this into the tap hole, let it cool enough for the Delrin to harden, and then remove. Bit of an art getting it right, but with a little practice can give a better result on inside threads than using a tap.

"Fine" here is relative. I've done this with everything from tiny 56 tpi screws to 10-32.

All I used to know about Delrin was that it was soft and machinable. One day I visited a plant that was doing some injection molding for the company I worked for and got into a conversation with one of their engineers, who mentioned something about some Acetal casting he was doing for another contract.

"Acetal? That's Delrin, right?" I had no idea that Delrin was a thermoplastic.

He of course had to tell me everything about it and show me the trick with the heated screw for

thread forming. He also demoed some casting.

I haven't since tried it myself, but I've thought about it off and on for undercut cavities and the like. He had a little electric melter that looked like a lead-casting pot. He just threw in some chips and sprue cuttings, melted it down (five minutes, tops) and poured it over a dollar coin in a Pyrex Petri dish. When it cooled it looked just like the stuff you buy in rods, and as far as I could tell cut just the same.

Anyway, true Delrin melts at 347 degrees F, and really starts to flow between 400 and 450 F. It also absorbs water quite easily and expands, but it can be dried out in a 300 degree oven for an hour, which might be a good idea if you start from a lot of small pieces that have been laying around for a while.

Glad it worked out.

Williem

Finished Valve



Reamer blanks make excellent valve stems.

Valve Stem Travel

If the rifle is having trouble making power with a heavy pellet, check the valve stem travel in an assembled valve. Not all factory valve springs are created equal. There should be about .10 inches of stem travel. Some factory springs only allow about .07 inches of travel.

Removal Tools for the Firing Valve

I wasted a 12mm socket on my QB tool... Rich



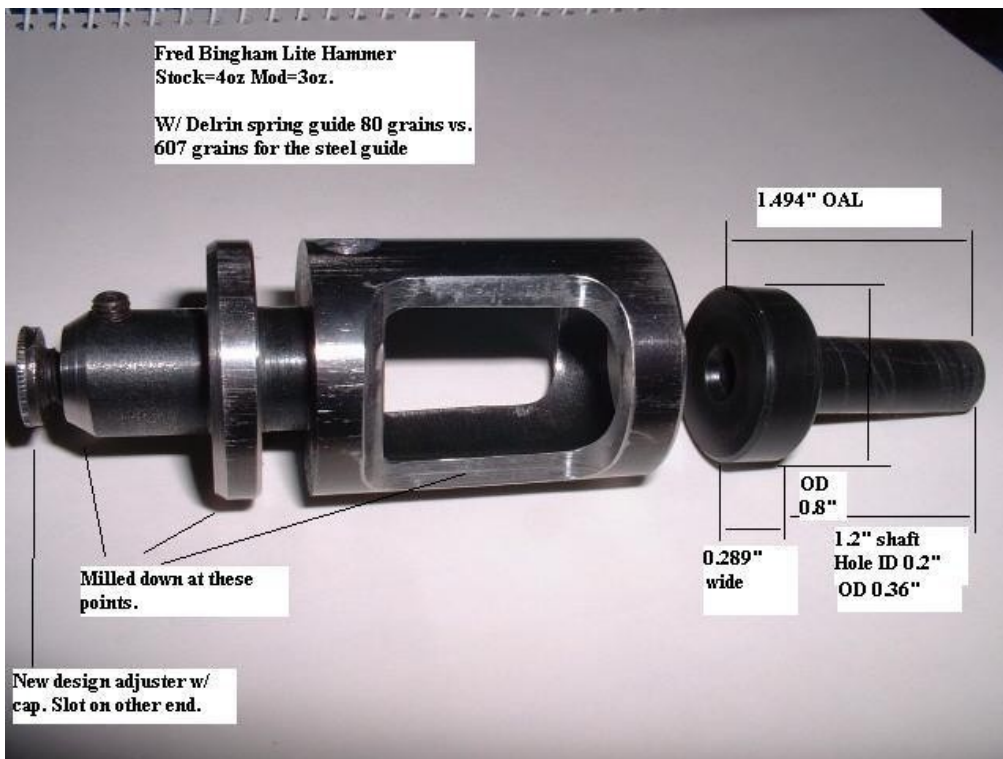
Okay, so it's not so elegant, but it works like a champ!

I squared off one end of a chunk of pipe. While it was in a vise, one end up, I cut the slots approximately 0.1" apart. The groove in the valve is very near that. I then cut in from the sides to leave only the tips. A little file touch-up and she's good to go. I should probably wrap it with tape to prevent scuffing the bore.

I didn't have to use anything other than my bare hands to loosen the valve. Rhoderman



Light Hammer



If you want less weight, just replace the heavy steel spring guide with a plastic or aluminum guide.

The stock steel guide weights 607grns, a Delrin guide is 80gms and Aluminum is about 220grns.

More adjusting the B50

Disclaimer: I'm a novice air gunner, not an expert. I'm sharing what I've learned from practical experience and reading. Correct me if I'm wrong. That's how we all learn.

Here are the things that effect MV on the B50 to the best of my understanding.

1. Fill pressure

2. Valve lift (how far it opens)
3. Valve duration (how long it's open)
4. Pellet weight
5. Air path flow efficiency

Assuming that you want a constant fill pressure of 1700 psi and plan to shoot .177 heavy pellets (10g?) what's left that will help you reach your goal.

Air flow - from the transfer port "experiment" you conducted we can assume that the air flow is sufficient to attain your goal.

The valve lift and duration become the variables that you can "adjust" to get to your goal assuming that 1700 psi (117.2 Bar) is enough pressure to do that.

Valve lift and duration can be altered with changes to the following the following:

These are interactive components. Changes to any one may effect the other. You may need to balance changes to each component to get the desired end result.

Hammer weight
Hammer spring rate
Hammer travel distance to valve stem

General effects (not absolutes)

Increasing the hammer impact on the valve stem increases MV assuming sufficient air pressure is available.

You can do that by:
Increasing hammer weight (within limits)
Increasing hammer spring rate, use a stiffer spring
Increasing hammer travel distance to the valve stem by adjusting the hammer screw out.

You can also change the valve return spring to a lighter rate (less stiff) to allow the valve to open further (lift) and/or longer (duration).

All that said, if the hammer spring was hung up in the cap making it compress more on your first test shots, it would have imparted more pressure on the hammer. When you took it apart and installed your hammer assuming the spring was then properly seated in the cap, and less compressed, it would have imparted less pressure on the hammer resulting in lower MV. When you reinstalled the original hammer, again properly seating the spring, you got the same results. Assuming the hammers are exactly the same and only the adjuster was in on yours (increasing hammer travel) that may not have had much effect at the fill pressure your using (i.e. the valve was already opening to it's max travel and duration). You may want to look at using a lighter valve return spring. Depending on how many shots you want per fill you may want to consider going to a slightly higher fill pressure, and experiment with hammer and valve spring combinations. You may also try using a smaller transfer port to help regulate air flow and use a spring combo that will open the valve fully.

Adjustable Hammer Spring

If I understand your idea correctly you want to shorten the hammer spring guide so the hammer can be pulled further back. I'm not sure what the material is but a grinder would probably work to remove hard material. Keep in mind that as you remove material to allow more distance between the valve stem and the hammer (to increase impact) you are also lowering the weight of the hammer reducing the impact. One of the ideas I've seen posted by someone else is an adjustable hammer spring. An end cap with a screw threaded into it where the safety normally attaches is used to increase or decrease the spring tension against the hammer. The spring has a small button on the end that the screw rests against. By turning the screw in or out you can adjust the force the spring applies to the hammer. I'm planning on making one for my B50. Ya, I know what you're thinking. If that guy ever finds the time he'll be dangerous! I'm going to have to take a vacation in order to do some of this

stuff! LOL

B-50 Hammer work

It's just my personal opinion, but I don't like to do any modifications that can not be reversed. Cutting on the hammer is one of those things. A lighter hammer will give more shots, but merely adjusting the hammer screw will accomplish that as well. Just unscrew it (make it longer) by about 1/4 turn at a time until you get the power range you want. The longer screw in effect makes a longer hammer, and it will have less momentum as it strikes the firing valve. Much in the same way that the lighter spring doesn't push the hammer as hard and creates less momentum.

My experiments

Lightening the spring guide in all of my experiments only created shot strings that had higher extreme spread!!! Not a desired result. I used a plastic spring guide so it made the hammer assembly much lighter and found that out.

The point is what do you want the gun to do? Shoot faster with a low fill (faster is less shot count)? My latest change was the lighter valve return spring (inside of the valve itself #19). This made for more speed 800fps up to 900fps. I had a spare stock spring (#29) that I cut to size and exchanged for part #19. It did not affect the fill pressure but gave me more speed with the McMaster-Carr spring. The higher MV still ate up my shot count but I could live with that. Easier to cock, lower fill pressure and a few less shots. The lower fill pressure lets me get 100 refills on one scuba tank, and I still get all the speed I wanted.

I do have some extra transfer ports in various sizes thanks to my friend Jim Platt. They do regulate the MV to go SLOWER. When I change to the smaller transfer port I can shoot 650fps and get around 70 shots usable in my 22 cal.

The question is what do you want your gun to do. From there I can surely help you.

B50 works great with RWS 16mm Brake

All you have to do is put the stock brake on a lathe, take it down to 16mm, cut it off 2" and slide on the RWS brake. It makes the rifle about 1" longer and makes it look too cool! The RWS cap unscrews, so you can clean the bore without getting your cleaning line snagged inside the brake. Over-all, it's an all-around better brake.





When you turn down the old MB to fit inside of the RWS 16mm, you should leave the area around the little set screws alone. If you make that part too short, you might have trouble putting the dust cap over the fill nipple.

The old MB does get a little thin, but it's still very strong. It's thick enough to drill out a small pit for the RWS set screw. If I get worried about crushing it, I'll just bond it on with JB Weld epoxy. (But I don't think that will be needed).

Anyways it works fine and maybe because the end-hole of the RWS MB is about .35 cal, there wasn't any effect on POI at all.

I've turned down a few BAM brakes for guys using the measurements above and they seem to be a good fit. I've seen a 'very' small difference in the (8 or 9) RWS muzzle brakes IDs.

Anyways, if you look real close between the barrel band and the Brake, you can see a flattened o-ring. I put that o-ring around the muzzle before installing the brake. I place the rifle nose down on the floor, before I tighten up the set-screws. That (flat) o-ring keeps the barrel from moving around in the barrel band (it's over-sized).

It's has a lot more internal volume than the stock brake.

It's 6" long and:

The part that slides onto the barrel has a 16mm ID and is 2.1" deep.

The remaining 3.9" of 1" tube has a ID of about 0.871" & OD of 1.01" with a screw-on cap at the end.

(Exit hole is .311")

xxxxxxxxxxxxx _____
_____/

<--2.1"-->|<---3.9" (ID 0.871)----->| Cap hole .311"
ID 16mm
_____|_|_
xxxxxxxxxxxxx \ _____
Allen/

From:

<http://www.network54.com/Forum/324398/thread/1091576930/>

Just by ear, I would say it cuts the noise a LOT better than the BAM MB.

There is no way I could shoot in my backyard without the RWS. The stock BAM was just a little too loud.

The only thing I don't like about the RWS16, it makes the rifle just a little bit too long..

When you use the RWS MB, the ping seems a lot louder.. 😊



Superglue or a finishing nail, wire would also hold the end cap on.

Chuntsman down to FT power? (<20fpe)

B50 FT power adjustment.

Attempt to get 900 fps/<20fpe with .177 cal CPHs.

After seeing no change in velocity with 1/4 & 1/2 turn, I turned the adjustment screw out about 3/4 of a turn and pumped up the gun to 190 bar (2755 psi).

The shots started off in the low 700s and went into the high 900s rather quickly.

When the pressure dropped off to 150 bar(2,175 psi), it seemed to steady out in the <20 fpe range. Since the sweet-spot-peak had too much power, I tested on the down slope.

Starting pressure 150 Bar (2,175psi)

Ending pressure 118 Bar (1,711psi)

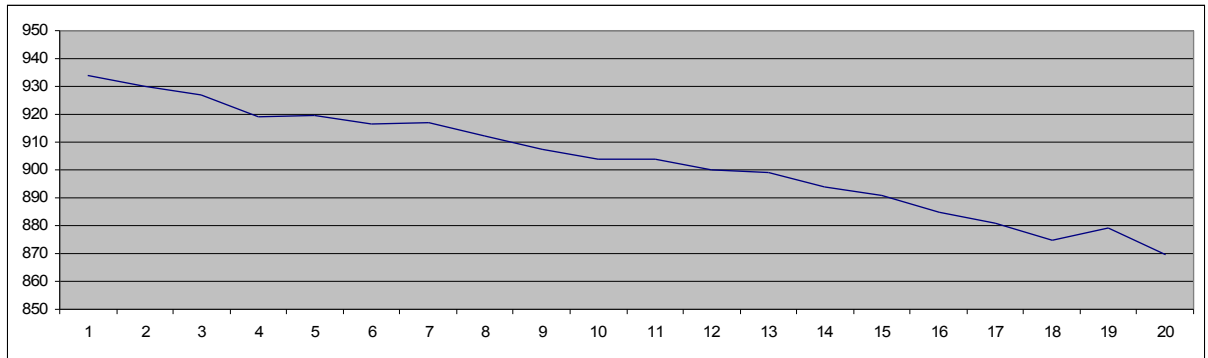
Number of shots 20

PSI drop=464 / 20 shots=23.2 PSI drop per shot.

Lo=869.6

Hi=934.4
Av=903.4
Es=65
SD=19

1. 934
2. 930
3. 927
4. 919
5. 919.6
6. 916.6
7. 917
8. 912
9. 907.6
10. 904
11. 904
12. 900
13. 899
14. 894
15. 891
16. 885
17. 881
18. 875
19. 879
20. 869.6



Not real happy with these results. I think that getting more shots and a smaller Es is going to require cutting down the hammer and spring guide weight. Or, if I were to shoot an FT match, I could re-fill every 10 to 15 shots.?

Are you set up to make a smaller port insert?

That would be easily reversible, and seems to be one of the more effective power adjustments. If not, could you loctite a short section of hobby shop brass tube in the port? Separate piece,(?) easy to heat if removal was needed.

If I had my own lathe, I would have done that already :)

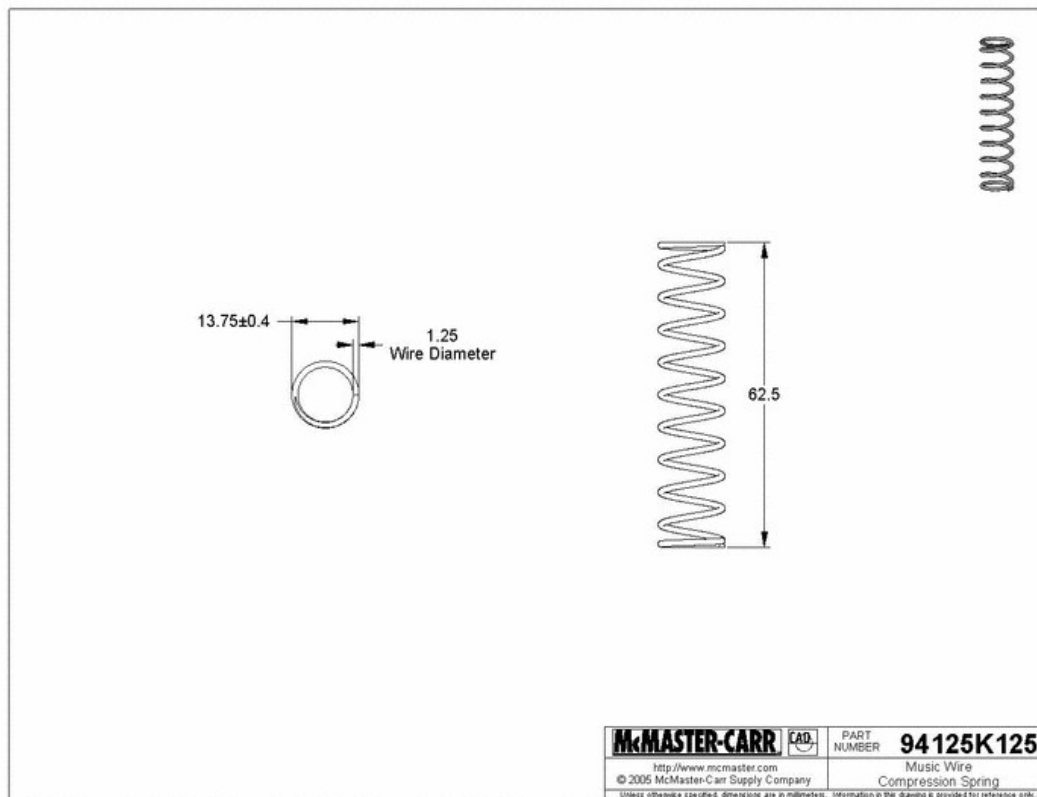
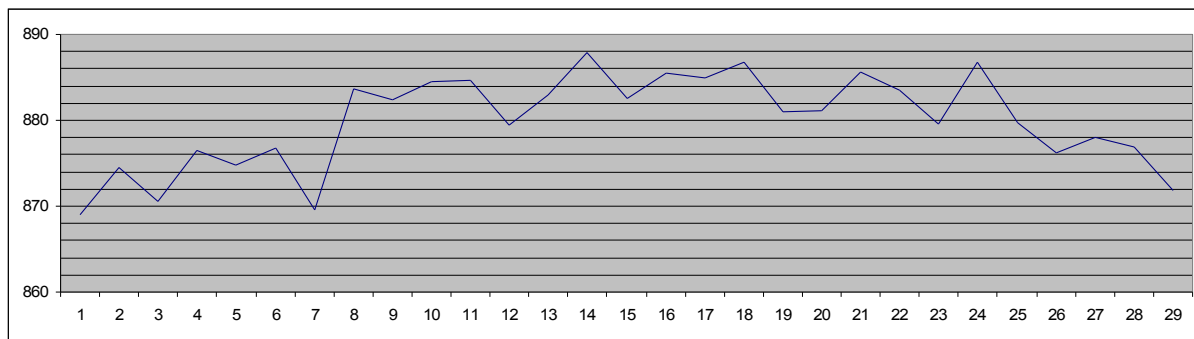
But the tube insert idea would be easy to try. That was the first idea I had, the second was to place a small thin washer on top of the upper O-ring. The washer would have a smaller ID than the brass port. And be a perfect fit into the depression on the bottom of the breech.

Need to think about that one. I don't want any metal blasting up into the breech.

Chuntsman .177 @ 17.5 fpe

This is what you can expect from a simple spring replacement (McMaster-Carr <http://www.mcmaster.com/> # 94125K125) and a 2100 psi (144.7 bar) fill. My B51 is as stable as many regulated guns with just as many consistent accurate shots using much less air. Unless you are using the Chuntsman for hunting and want the 20+ fpe, this simple adjustment belongs in the "no brainer" category as an initial step. Intelligent valve work and transfer port resizing done by someone who really knows what they are doing MAY even improve on this performance; but this is quick, cheap, and your trained Chimp can safely do the job.

1 -869.02
 2 -874.48
 3 -870.52
 4 -876.51
 5 -874.73
 6 -876.70
 7 -869.64
 8 -883.68
 9 -882.45
 10-884.51
 11-884.64
 12-879.37
 13-882.90
 14-887.89
 15-882.58
 16-885.49
 17-884.97
 18-886.72
 19-880.97
 20-881.19
 21-885.62
 22-883.55
 24-879.63
 25-886.72
 26-879.76
 27-876.19
 28-878.03
 29-876.89
 30-871.77



My 5 pack came in today and I tested one tonight. Did not like the fit at all. The spring OD is too big. It has to be pressed into the rear plug.. 😞 Maybe when it wears in a little, I'll test it again.

Filled the B50 to 180 bar(2600psi) and checked the power adjustment range. I was shooting some old

RamJets and wanted to get 12 to 15 fpe.

Since my hammer is light (3oz instead of 4oz stock), I had to open the hammer gap up all the way (full power). It started off in the low 600s..

I fired it 15 or 20 times to get the MV up near 700fps. Then, I started taking some data.

String #1 32 shots. Lo=692 Hi=732 aver=713

String #2 32 shots. Lo=748 Hi=809 aver=777.5

String #3 32 shots. Lo=821 Hi=894 aver=863

String #4 32 shots. Lo=781 Hi=878 aver=836

After 128 shots, I got tired of shooting! The air pressure was down to only 70 bar(1000psi) (12.5 PSI per shot?) At 1000 PSI, the B50 was still delivering over 15 fpe!

Looking at the numbers, I'm just about positive that I can fill my B50 up to around 2400 psi (165.4 bar) and shoot about 50 squirrels and still have some air left over!

Yeah, I think I'm going to keep this spring for a while 😊

Different spring

Available at most hardware stores. #152 - .047 gauge wire – 2.5 inches x .5 inches – 11 coils

I don't have a stock hammer

I exchanged it for the lightweight hammer.

My hammer screw is also non-stock. It has a little cup on the end that hits the valve stem.

I think it's a little longer and that's one reason that I had to set the screw for maximum gap (max-power). And of course with one ounce less hammer weight means less slam to open the valve fully.

Right now, it's just about perfect for 30 yard shooting. Enough power for vermin and tons of shots! 😊

With your heavier hammer, I'm going to guess you will be able to get about 30-40 good shots in the 18 to 20 fpe range.

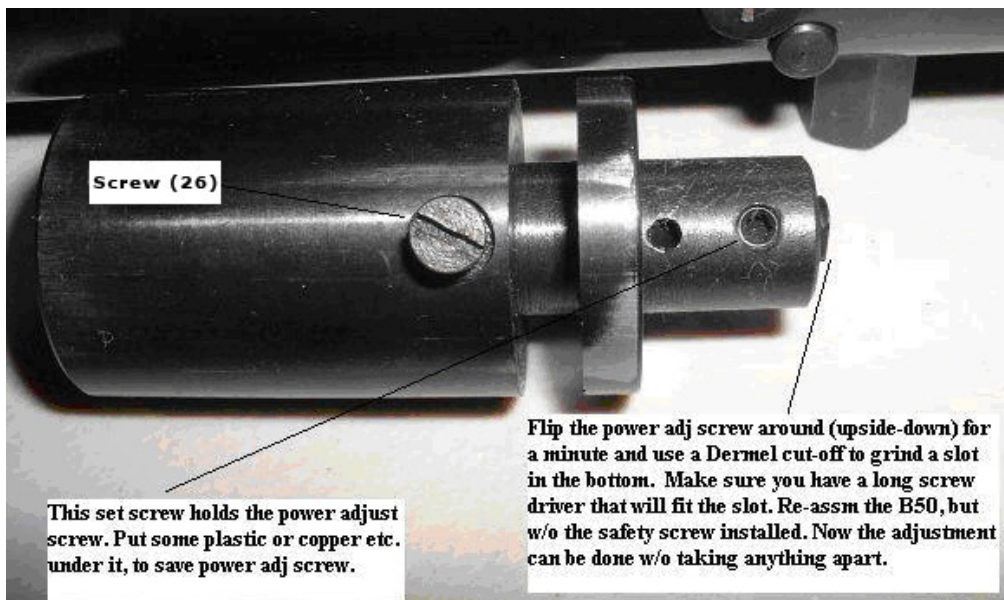
Screw #26 removal

For observation, throw out part #26 'Striker Pin' (screw in top of hammer) and you can remove and adjust striker length without removing the breech/barrel. With out that screw I can pull/adjust/reinstall in 120 seconds if pressed to do so. So far Rich is the only person who has offered any idea on why that screw is there in the first place.

No pre-loading

The power is adjusted by the gap between the striker screw and valve stem.

It's all explained in the power adjustment posts.



this a stock hammer.

My hammer and striker screw-cap are an odd-ball case. Less weight means I have to open the gap up wide for more hammer impact, and I still get lower power (from the weaker spring). But getting over 100 shots makes me happy!

Re: New B50 hammer spring tested. <Data included>

Ok guy I got to shoot with that new spring some today. I filled the gun at around 1800 psi (121.1 bar), and proceeded to fire 30 shots.

Here are the numbers that I got:

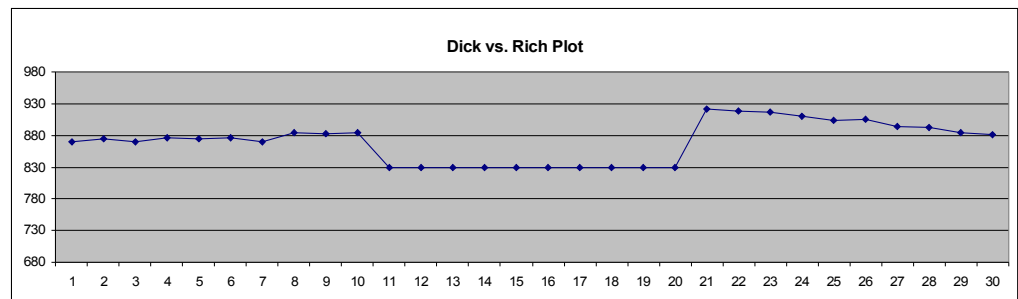
Shots	Grains	FTLBS
921.00	10.60	19.97
918.00	10.60	19.84
916.00	10.60	19.75
910.00	10.60	19.50
904.00	10.60	19.24
905.00	10.60	19.28
894.00	10.60	18.82
892.00	10.60	18.73
885.00	10.60	18.44
881.00	10.60	18.27
871.00	10.60	17.86
869.00	10.60	17.78
863.00	10.60	17.53
854.00	10.60	17.17
850.00	10.60	17.01
845.00	10.60	16.81
838.00	10.60	16.53
831.00	10.60	16.26
824.00	10.60	15.99
816.00	10.60	15.68
809.00	10.60	15.41
804.00	10.60	15.22
796.00	10.60	14.92
789.00	10.60	14.66
783.00	10.60	14.43
772.00	10.60	14.03

766.00 10.60 13.81
759.00 10.60 13.56
750.00 10.60 13.24
742.00 10.60 12.96

They only thing that is not as per Dick Otten's test is that I used a lower fill number. But even with that I'm still posting higher FPS than he is and I'm 300 psi short of where he filled his rifle. I'm a bit dismayed that our numbers don't remotely resemble each others in most respects. I can say this how ever this mod makes a lot of shots per fill from what I can see initially, although I have not counted them until the tube was empty.

Note in side by side comparisons his first 10 shots are here as oppose the what I get:

HIS	MINE
1 -869.02	1 -921
2 -874.48	2 -918
3 -870.52	3 -916
4 -876.51	4 -910
5 -874.73	5 -904
6 -876.70	6 -905
7 -869.64	7 -894
8 -883.68	8 -892
9 -882.45	9 -885
10-884.51	10-881



Quote From Rich

>Did not like the fit at all. The spring OD is too big.
>It has to be pressed into the rear plug..

Rich I thought the same at first glance, and after checking realized that there was only like .058" difference between the ODs of the 2 springs. The new one was .537" and the original was .479". I found there was only like 1-2 thousands difference in the recess where the old spring rested and where the new one had to take its place. I simply closed the end cap assembly and that seated the spring. Once the 2 screws are in place its a done deal.

Any ideas on why these numbers are not making it in terms of consistency from rifle to rifle? Anyone besides Rich and myself tried this mod? Wondering if Dick had another mod and forgot to mention it? I know he didn't do a port mod because he stated that in his post...

I think you need to turn down the power a little

I saw a post on the other board:

"Re: turning the power down by 10% reduced air consumption by 50%"

Looking at my results, that just might be true. I can't think of any other reason.

Turn the power down and increase your fill pressure to a higher range.. 2000 to 2800..
(Start on the low end to avoid Lock-Up).

BAMB50 lite hammer/guide/spring test

I've got a milled down hammer, aluminum guide & a weak spring.. So, it shoots a little too weak with higher pressures. This evening with the snow blowing around outside, I decided to explore the world of Low Pressure PCP shooting.

.177 cal RamJets, Four 32 shot strings. (128 total shots).

1.

Starting Pressure:2175(+/- a few) (150 bar)

Ending Pressure:2001 (138 bar)

LO=670

HI=730

AV=697.6

ES=59.6

SD=15

2.

Starting Pressure:2001 (138 bar)

Ending Pressure:1740 (120 bar)

LO=700.2

HI=767.4

AV=730.1

ES=67.1

SD=16.43

3.

Starting Pressure:1740 (120 bar)

Ending Pressure:1479 (102 bar)

LO=739

HI=801

AV=771.3

ES=62.12

SD=15.23

4.

Starting Pressure:1479 (102 bar)

Ending Pressure:1160.3 (80 bar)

LO=778

HI=802.7

AV=791.7

ES=24.77 <---- 😊

SD=7.14

When I was talking the last few shots, I knew string #4 was a winner. The ES (Extreme Spread) dropped from the 60s down to 24.77 fps!! Now that's what I was looking for! The average MV of 792 isn't too shabby. 13.65 fpe will take out most of the backyard vermin and it should be right on for about 30-40 shots if I use a 1500 psi (103.4 bar) fill.

Yeah, it was one long and boring Chrony shoot, but now I've found the sweet spot for my lite setup has a very low operating pressure! Ergo, easy pumping and easy on the Scuba tanks too.

269 refills with my old 80cuft 3000 psi tank. $269 \times 32 = 8608$ shots = 17 (500 shot) tins.

My new Super 106 tank would give me 464 fills!!! Humm that's way too many shots!! 😊

Just picture a lot of numbers around 792 +or- 12fps.. 😊

You got to admit, 24.77fps is a good spread for a quickie mod job. The lock time does not seem to be effected by the weak spring.

I'll have to do some off-hand shooting this week to check it out.

If it's working the way I thing it should, this thing should be great for indoor off-hand practice this winter!

And if a squirrel or two should happen to venture out onto the snow... 😊

More spring information

I am not sure if they can be as easily adjusted as the original, but there is a striker adjustment that changes the length of the hammer stroke. From a few reports from people tuning them, the hammer spring is a bit on the heavy side and overall shot consistency is better with a slightly reduced amount of hammer spring tension. There is no direct way to adjust the hammer spring so the options are trim it a bit at a time, using the striker adjuster for fine trimming, or replace the hammer spring with a lower powered one. You can also reduce the fill pressure and use the striker adjustment to tune it to a lower level.

Re: BAMB50 lite hammer/guide/spring test

I have a variable power B50. The air passage feeding the area behind the pellet is intersected with a small allen head screw. The end ground round to more or less match the size of the passage. It works fine at the full pressure, yet reduces velocity. Mine only gets down to the 800's, but could be made to fit more closely and choke it off more.

A good side effect is a very flat even velocity curve for about 40 shots. Well just checked some tests. 856 fps to 869 fps and back to 857 fps over 38 shots. I ended up only using full power or full choke. Though it can be dialed out by counting quarter turns for different settings. This way you could go to low or high power in seconds without changing anything.

Now you still have to pump up to full pressure. So the lighter spring etc. has the advantage of letting you pump to a much lower pressure. Just thought I would mention it as an alternative to making other alterations. For anyone who wanted to have their cake and eat it too.

Variable power screw install

It is ninety degrees to the port. Mine is on the left side of the receiver, though you can put it on either side. Yes it is small, you need to precisely drill a hole and then tap it. The end of the cap screw needs to be rounded or it doesn't block off much of the passage until it bottoms out on the opposite wall of the transfer port. If I remember rightly, it uses the same allen head size as the Millet rings I use. Might have to check that, I just keep one with the rifle. I also think the hole we drilled was slightly larger than the passage itself.

Rather simple really, and works very well.

Power Adjust Screw BAM B50

From what I've read about adjustable guns, using a screw to block off the air in the breech block seems to be pretty common.

I'm not sure, but my AA S400ERB has it's flow control setup somewhat the same way. (And the S200 too IIRC).

I may try the idea out by using a brass home-made coupler (the little brass button between the two O-rings that fits between the breech and tube).?. I might make a few and drill them with smaller holes to get the air flow I want.

I've read at least one report that smaller hole worked very well for converting to a 12pfe AG. ES was said to be good also.

However, even if I could improve on the current numbers, the lure of using 1500 PSI (103.4 bar) fills is strong. Considering I want to use the old 3000 psi Scuba tank for this rifle. 😊

I want to save the Super-Tank for my S400ERB which really likes 3000 PSI fills.

Grammerman's power adjustable B50.....?

My stock B50 in .177 shoots Beeman Kodiak Matches, Premiere Heavies and JSB Exact Heavies near 1050 fps. Accuracy at these speeds suffers. When I get enough charge off to lower velocity to 950 or a bit less groups tighten dramatically. Accuracy is very good below 950. But it takes some 30 shots to drop a 220 bar (3190 psi) fill down to 160 bar (2320 psi) and get the needed velocity range. All speeds measured with a chrony.

So Grammerman wants to drill into the side of the receiver, and put an 8-32 fine thread set screw that will intersect the transfer port. This way I can adjust power. Choke it down on a 220 bar (3190 psi) fill so I get the velocity I need for accuracy. Then adjust the opening to expand how many shots will shoot in this same velocity range.

This seem like a good idea, or should I just tune it differently with the hammer spring and/or valve return spring? Or someone have another idea? Anything wrong with this approach?

To start with the hammer is too heavy.

I made a Delrin spring guide to replace the steel one that adds to the hammer weight. LD posted doing the same thing. Then I try different hammer springs and different size transfer ports. Mine tuned out about right with just the lighter hammer. You can take off the safety and make an adjustment screw to adjust hammer spring tension. You have to cut out a notch in the stock to turn the adj. screw without removing the stock.

B50 adjustable power results.

Grammarman put a 32 tpi #8 screw in the side of my rifle which intersected the transfer port to the barrel. This allowed me to pinch the transfer port for adjusting power. I originally wanted this as with the heaviest generally available .177 pellets, my B50 was pushing them over 1040-1050 fps. Which while quite strong, was detrimental to accuracy.

Results were quite good. At minimum opening, on a 210 bar (3045 psi) fill, I got 40 shots starting at 845 fps, peaking at 869 fps, then dropping to 845 fps again at 170 bar (2465 psi). This with JSB Exact heavies. And I was using only 1 bar (14.5 psi) per shot.

Even better, I got an incredible 22 shots in the middle of the fill, with a velocity between 864 fps and 869 fps. That's right, 22 shots with near identical velocity. 11 shots in the middle of this were all 868 fps and 869 fps.

Backing out the adjusting set screw 3 turns, yielded a curve of 952 fps peaking to 1004 fps then back to 952 fps over 35 shots. Air usage was 1.5 bar per shot. This curve is also quite good, and done with a 200 bar (2900 psi) initial fill.

Further opening of the set screw didn't increase velocity. Actually 2 turns open only knocked off maybe 5 fps.

During testing of setting the power, one turn open increased velocity from 859 fps to 981 fps a bit below 200 bar (2900 psi). A half turn on the set screw gave 926 fps. While a 1/4 turn open from minimum gave 890 fps.

So as long as I have 1/2 turn open on my power set screw, I get velocities which allow very good accuracy. Opening more than this, velocity gets so high accuracy deteriorates.

Now one puzzle, why did the rifle only shoot 1004 fps wide open, when previously it shot up to 1050 fps? And when it was shooting at these higher velocities, it used about 2 bar (29 psi) per shot. Obviously as you would expect with less velocity, there was less air usage.

Overall I am quite pleased with the results. While I don't have detailed accuracy results yet. It clearly was shooting better groups during this testing.

Thanks! Grammarman, this was an excellent idea.

B50 Barrel Removal Help

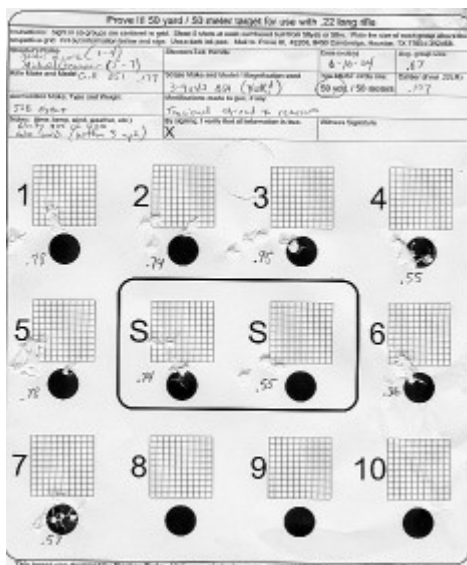
The barrel is glued in with epoxy (tough stuff). I converted mine to .22 a couple of years ago before the factory began producing them. I used Loctite to glue the conversion barrel in and it is as solid today as it was when first done.

I used a high temperature heat gun, not a hair dryer although you could use a torch just don't get it hot enough to destroy the bluing & a manually operated press. A piece of 1/4" rod inserted from the breech end after heating and it came right out. The glue that was in mine also appeared to have either ceramic or powder metal in it. It was sort of a gritty feeling.

B50 B51 tensioned shroud barrel project and accuracy info

Here's a photo of a tensioned barrel shroud that I'm building for Carl. It uses the shroud tubing to stretch the barrel and alter it's harmonics. I got things put together and did some preliminary groups today. I wanted to see how it would shoot free floated first and that is how it was tested today. The scan shows all 9 groups we shot at 50 yards, the average of the 9 groups was .66", average group size at 30 yards was somewhere between 1/4" and 3/8" with most groups being one ragged hole. As you can see from the photo, I have an awful BSA 3-9x 40 scope on it that is definitely affecting accuracy. I think it will gain around 1/8" in group size immediately when I mount a better scope which focuses on the target clearly. We didn't have time or perfect conditions to dial in the shroud tension to the absolute perfect setting at the velocity we were testing at but did try several settings and could tell it affected group size significantly.

The velocity adjustment screw I installed had JSB Exacts going a max of 920 fps when fully screwed in (the lowest velocity setting) which is about right for max accuracy. The current tuning at that particular setting has a max fill of 2750 psi for the sweet spot and delivers 35 shots within a 35 fps spread starting at 885 fps, peaking at 920 fps and back down to 885 fps at about 2000 psi. It is using a little over 1 stroke per shot from my Axsor pump at this tune level.



XS-B50 group

It's entirely possible that your barrel support at the end of the tube has been knocked out of alignment. I'd loosen the three set screws and pay attention to whether it rotates as you loosen it (which would indicate that it had the muzzle end of the barrel torqued to the side). Even if it's not bumped out of alignment you could try to use it to rough zero things. This will likely affect accuracy and sometimes will cause to point of impact to shift somewhat dependent on reservoir pressure, but sometimes it works fine with no problems and even improves accuracy.

Re: XS-B50 group

Yep, Grammerman is telling you right.

I also put a large o-ring around my air reservoir, just behind the front barrel clamp. This placed a small (1 or 2 lb) upward force on the barrel to help it tend to stay up against the barrel clamp. As there is some loose movement in those clamps. Seemed to make POI stay consistent over time.

Anyway, try Grammerman's suggestion before spending money.

Grammerman is probably on track with the correct fix...

it looks like that barrel support is similar to the setup on my 410E. I had to loosen it up and monkey around with it quite a bit to get it perfect. You'll find that if it is pushing the barrel a lot left or right, even if you can get your scope lined up with the POI it will change at different ranges.

What I ended up doing (seemed like the easiest solution) was marking the barrel strap and the reservoir with a lead pencil. Loosen it up and make a small move (hopefully in the right direction) and try it out. Once you get the POI lined up with the scope at say 25 yards then give it a shot at 50 yards. It's important to make the reference marks on the barrel band and the reservoir so you know how far to move it.

A small move on that band will make a BIG difference on the POI. Once you get it exactly where you want it you may want to make a permanent reference mark so you don't ever have to repeat the whole procedure.

new Bam50 transfer ports

"Dan in MI" made us some new transfer ports for the Bam50, we already had three, stock, large and small, I tried coloring one with sharpie and ended up cutting a line in it with a file for easy identification. Dan used some coloring process for the newest ones (feel free to tell me how you did that).

The black one is 2.8mm the red one is 1.78mm the unmarked one is LARGE (I have it written down somewhere???) the ugly one is stock and the filed one is in the rifle for 70 shots at 19.7 fpe within 15 fps in .22. The large one produces 40fpe. Also in the pic is the striker(hammer) Dan milled shorter for us.



Transfer ports are easy to make. A 1/16" drill bit creates a 1.6 MM port. Each .004 bigger is approximately 1/10 millimeter. (Actually it is .003937, but that's getting into splitting hairs.) The body is .308 by .205 long overall, and then you cut it to make 2 shoulders of .187 diameter by .050 long. One shoulder on each side. (Just like the port in your rifle, but with smaller hole.) I think the standard port is 2.8 MM.

Re: new Bam50 transfer ports

I used red and black Sharpies John.

The port diameters are 1.78mm, 2.08mm and about 3.1mm respectively. The stock port is about 2.8mm.

Let us know what your results are when you try the other ports. Thanks for the compliment.

one of several transfer ports, again by Dan



A polished striker (which I refer to as the hammer) and cylinder clamp. Also stock and modified probe.



Mr. B50 Hi-Power!!

Also this is with the 25" HW barrel, stock spring, - 2mm off the front of the hammer, and 60g added to

the spring guide. .22 caliber, one of my best targets with the 25" HW barrel



my best ever 100 yard Bam50 group !

Bam 50 w/HW 25" barrel .22 filled to 1700psi (117.2 Bar) using JSB Exacts approx. 770fps Simmons 6.5x20x44mag fired from a table using a flat bag 10 shot group the fuzzy coin is a dime.

I did put a mirror polish on the hammer (as suggested in one of the Daystate tune .pdf you sent) and I removed the screw on top of the hammer (#26), lightly polished the inside of the hammer tube, lubed with MP-10 (marine version of FP-10) light spring, adjuster screwed all the way in for about 770fps w/ 16g AND the HW barrel. JohnB

The Bam as it is today, 25" HW barrel with stock (machined to fit) M/B. A true one hole rifle.



where is your leak ?

Really straight forward disassembly. It seems odd that Tim repaired it and it still leaks. Soak it in the tub, it sounds bad but its not something you need to do often.

As Tim already worked on it I will wager for the striker valve (#21) to be going?????/

Shoot us an email and I will forward to you my favorite (pictures included) Huntsman strip down manual.

No special tools needed other than a rather long screwdriver if you remover the valve.

The safety spring & detent will fly! If the roll pins on the trigger housing are not taped they can fall out. That should be it??.

B-50 leak

According to my diagram, my best guess would be part #21, which is the pin that the hammer strikes to open the valve that lets a chunk of air push the pellet out of the barrel.

There have been a few repeated reports of a hairline crack in the seal on the back of the pin. In other cases, where the brass filter had been knocked out by scuba-blasting, there have been tiny slivers of brass embedded in the face of the seal. Either one will cause the slow leak that you describe.

For removal of the firing valve assembly, an extra long screwdriver is needed, and can save the O ring around the valve. The end of the valve, facing the fill cap, has a slot across the face of it. By using the extra long screwdriver you can unscrew this about a half turn and release the compression on the O ring. Then you can remove the pin and screws holding the valve in, and the valve can easily be pushed out the back of the tube without damage to the O ring. The cutouts in the tube will cut the O ring if compression is not released.

With the valve removed, just continue to unscrew the end cap of the valve. The spring pressure should be released as you unscrew the cap. Inside you will see the spring, brass washer and the seal/striker pin. Examine the contact face of the seal for anything that may be embedded, and look around the outside for a hairline crack. If there is something embedded in the face, remove it. When I had the brass sliver embedded, after digging it out, I took some 600 grit wet/dry sand paper, laid it on top a washer, and poked the pin through it. Then I twist sanded the seal down until the dent from the sliver was gone.

Take your time and make sure that the face of the seal is FLAT on the washer/sandpaper. The material used is not flexible and will not flex enough to make a seal if the face is not square.

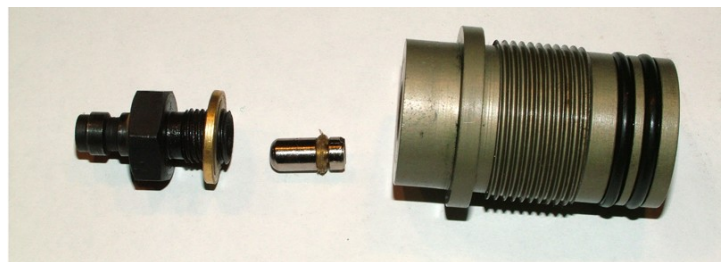
That part is on my list of things to make, once I get my lathe overhauled.

There are 3 seals up there.

The check valve O-ring seal

2. The fill nipple O-ring seal

3. The end plug seal O-ring



Take out all the air (Could get killed if you don't). Clean up the seals and lube them with some silicon grease (home depot).

Fill the nipple hole with liquid soap to see if the check-valve is leaking. Then, if that tells you nothing, try painting some liquid soap around the base of the nipple. No luck, then try the plug itself (if possible).

Leaky fill port is the most common problem with the B50

I've had the problem a couple times. Once was a slow leak and all I had to do was lube up the O-ring with silicone grease.

The other time was a fast leak due to the check valve stem not being all the way up inside the nipple. The screw-in filter had un-screwed and was too far back. And the valve was too far back and must have got cocked sideways and wouldn't seal. IMHO, the valve should only have 2 or 3 mm of free play.

Oh yeah, once I blew the filter out the back with a blast of Scuba air. (It must have been loose).

1. Use lube on the O-ring.
2. Keep the valve movement to a minimum.
3. Don't Scuba Blast the valve!

I positioned my filter and screwed in a 'Filter Holder' behind it. I used a short 1/8" NPT brass pipe to hold it solid. (screwed in behind the screen).

That sounds like what you should do with your window screen filter. (in this order). Nipple---Valve---filter_ Ring---window_ screen---1/8npt_pipe

In the hardware store, they call that type of pipe a " 1/8inch NPT brass nipple".

Getting into the air cylinder and filter brass problems

My money is on part number 25. These have a tendency to unscrew a bit, which lets the pin fall below the point where it will seal back up during the pressure relief after filling.

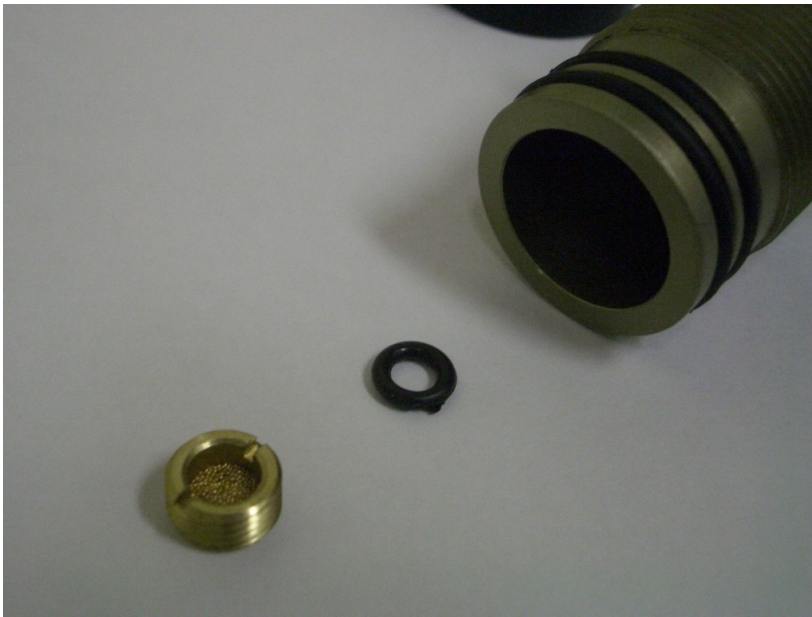
The notches for screwing it back in are inside the tube (actually, inside the cap) and I'd recommend Blue Thread locker once it is adjusted back in place.

The easy way inside the tube is as follows. Remove the 4 Breech Block screws (the back 2 are longer). Raise the block up about 1/4 inch and slide barrel out of ring. (Watch for Transfer port and O rings.) When that is done, just grab the Cap and Barrel ring, and unscrew the cap. The barrel ring gives a little extra leverage to get it started. There will be some resistance as the cap is unscrewed because of the friction of 2 O-rings on the Cap inside the tube. With the cap off, look in the tube and see if it has a bunch of brass slivers in it. If so, it's time for some alcohol.

About 2 ounces of Jack Daniels should relax you enough to start the process of cleaning the brass out. If you even *think* that the brass has made it inside the valve, better grab about 3 more ounces of Jack, because chances are that the valve will have to come out and be disassembled.

If there is no brass in the air tube, then pour 2 ounces and celebrate.

BAM brass filter



One solution is to put a small O-ring between the filler valve and the brass filter to prevent knocking the screen out with the steel valve piece....

This has to be inserted before charging the reservoir with compressed air...

I have had mine operating for the past 2 years like that without any hassle.... Just do not dump the air into the cylinder too fast when filling... It is a good idea to bleed in the pressure fairly slowly, until you get to max. pressure....., then bleed off quickly to get the one-way valve to set into the Foster fitting.....

malan

Setting the Distance of the Brass Filter to the Check Valve

With the fill assembly removed from the air reservoir, push a small rod such as an Allen key or paper clip through the Foster fill hole. This will release the o-ring from it's seat. Shake the fill assembly, it should just rattle. No rattle, move the filter away from the check valve with a screw driver. Measured from the top of the assembly to the top of the filter without the Foster is about 11.5mm (4.53 inches).

Put a balloon over your inlet

I'll bet the inner bore of the inlet adapter is rough like 90% of the B50's and 51's. The rare one is the smooth one you don't need to do much to. The o-ring is kinda soft compared to what I use but it isn't that bad and will seal if the surfaces are not so rough. The other point of contact is the thing that holds the inlet o-ring (check valve) and it is chromed steel and rough at the o-ring groove where it matters. You need to chuck that in a lathe/drill press and spin/file/sand that surface clean so it can seal.

PCP's should hold but many don't. That is one of the reasons you prep stuff and fix problems like that in the first place. A lot of guns go straight from Fun Supply to us and then to the Customer. It happens a lot.

Wouldn't "FREE MEN WITHOUT GUNS" be a RIOT?

Give it a bath

I had a leak and I tested not with a balloon but in my tub. A small leak was coming from first my nipple (no pun) did a teardown and a cleaning small piece of debris hung in the seal. It looked like a tiny piece of copper or brass. The second leak was in the seal in the valve mechanism which just needed a new o-ring.

Without the tub-in-test I would have overlooked the multi-leak problems. Dirty little gun probably a good scrubbing. Be sure to teardown and dry everything.

Stocks

I've shot one B51 at a target range and REALLY liked it. But, I have not carried one in the field. I have asked a few guys about using TH stocks for field shooting and they have replied, positively.. Great for hunting.

In my case, being a long time off-hand target shooter, I like the TH stock design and love the stability it gives my off-hand hold..

So, it's great for Target shooting. But, for hunting..?. Like I said, I haven't done it. And right now, I'm not sure I see the need for a TH for shooting rabbits..

Unless you hunt in a really wide open area, most of your shots will be at Airgun ranges. Mostly 10 to 40 yards. At those ranges, you will need a 3-9x or 4-12x scope hunting scope.

I can tell you right now, that using a 16x Leapers at 30 yards does not work for me, unless the squirrel is dumb enough to stop and sit in the open for 10 seconds!! 😊

I turn mine down to 10 or 12x for 30 yard head shots and around 7-8x for closer and when the vermin is on the move.

IMHO, a barebones B50 with a 4-12x (or the .22 S410ERB same scope) is idea for hunting.

The B51 .177 with a new Leapers 8-32x 56mm (30mm tube) would be my choice for shooting some serious targets.. (or the .177 S400ERB & same scope) 😊

I'm not sure about what you like in the LOP (distance between the butt plate & trigger), but I found the B50 was too long for me. I like them shorter, so I replaced the rubber recoil pad with a 1/8" steel butt plate. Some guys just saw 1 to 2 inches off and replace the rubber pad.

Does the B51 need this mod? It depends on your build. If you have a small to medium frame, maybe.

That's my story and I'm sticking to it for now!

MAC1 Tuned

It sounds like you're describing the plastic barrel band of a QB. Both of my B-51's have a nice quality metal "Barrel Support" that the barrel just slips into. I don't know if it would be considered a floating barrel design or not as there is a very slight amount of movement. It does have a couple of grub screws that help stabilize it against the air tube section. It doesn't clamp the barrel and air tube like the stock plastic QB barrel band. Rich has some great close up photo's of his that would show you what I mean. I think he is the one who tried securing the barrel with rubber bands to eliminate the Free Floating Barrel effect. Rich would need to fill in on the results.

I have never seen Tim's list of exactly what he does to them. He tuned one of mine and by the looks of it, he may have changed the spring and milled away some of the weight on the striker. Anything else he may have done, my very untrained eye didn't notice. I did notice a great improvement in accuracy, additional shots and about 100 fps drop in velocity. It turned into a real sleeper for Field Target Matches. I generally shoot it against FT rigs costing 5 times my B-51 with it's scope combined and it does very well.

At 19 ft lbs, it does very well out to 55 yards. Both of mine are in .177 so those who own the .22 version would have to chime in regarding farther distances.

I also had Tim install the older style / sized RWS moderator. HUGE difference over the much smaller stock moderator.

In a nutshell, I would always suggest buying one from Tim vs. buying from other sources and sending them to him. I had some QC problems with both of mine that were a hassle to deal with. If I would have bought it directly from Tim, that would not have been an issue.

right ,

He does seem to mill out the spring guide (lighter), I added 90g to mine for better fps spread with great results, but then I shoot 16g .22.

Different spring (and it isn't the McMaster-Carr spring), o-rings, removes brass "air filter" (throw the brass debris generating unit away!) and replaces it with ?, he did a nice job on the MB on the one I saw.

I posted that rubber band pic

That was when I was experimenting with holding the barrel tight into the band.
(The band is made from Aluminum).



After a while, I installed two small setscrews just under the barrel.
They push the barrel up towards the top of the band.

I found that leaving just a small amount of play worked best.

That McMaster spring is for reducing the FPE

If you want to increase the FPE, stick with the stock spring.

Adjust the striker gap to max and it should kick up the FPE a bit (At the cost of less shots).

I've used a smaller transfer port to cut the power (and get more shots), And I think others have used bigger transfer ports to increase power.

Just drill it out to a larger size and see if the velocity goes up.

I think John used a grinder and took down the striker end of his hammer a little bit, so he could retract the striker more than normal.

If he is around, I'm sure he can point you at some of his postings about super high power.. 😊

mill the striker/hammer ,

Perhaps 2mm off the front, Dan in MI machined this one for us, you can see how little is left in front of the adjusting screw.



Set the adjuster screw flush, add 90g weight to the spring guide, dropping six .20 cal. pellets in the center and taping them to crimp them in place with a hammer should work.

Our transfer port is from Dan also and slightly larger than stock. And we use a 25" barrel for ten shots between 1050 and 1070fps with 15.9g JSB Exacts.

Please explain

What's the use of taking off 2 mm of the front of the hammer when the part that actually hits the valve stem is the striker which is screwed in the center of the hammer? Maybe I just don't understand but I can't see the point in taking 2 mm of(=weight reduction) and then adding weight again.

Re: Please explain

By shortening the striker end of the hammer the screw can be turned in further yielding about 2 mm of additional travel. The modified hammer is about 2 grams lighter. John added six pellets at about 15 grains each which is about 6 grams total. Net gain is about 4 grams. The increase in weight and hammer travel seems to make a modest increase in fps.

If you want to use a larger than stock transfer port you will need to enlarge the valve transfer port and transfer receiver port as well. They are all the same diameter, about 2.8mm.

Another option you may want to try is shimming the hammer spring to increase the spring load on the hammer. You can add a small flat washer inside the end cap behind the spring to increase the preload.

You may also...

open the exhaust port on the valve to 3.17mm. Your shot count will drop but your velocity should reach about 280 M/S.

Barrel Hole

Cut the barrel hole as an oval so the pellet head does not tip into the hole.

It's force, not pressure, that accelerates the pellet down the bore, and force...

...equals pressure x area.

The area of the base of a .22 pellet is only 1/27th of a square inch. So 27psi is required for every pound of "push" moving the pellet toward the muzzle.

Many PCs generate muzzle energies of upwards of 30 foot-pounds, and do it with barrels that are little more than a foot long. To do that requires an **average** accelerating force of ~30 pounds and therefore $\sim 30 \times 27 = \sim 810\text{psi}$.

In other words, 810psi is the **minimum theoretical** pressure required to impart 30 foot-pounds of kinetic energy to the pellet, *if that pressure could be delivered at a constant level all the way from breech to muzzle.*

But the pressure in the barrel of all practical PCPs is **not** constant over the firing cycle, but in fact is much higher when the pellet is near the breech at the beginning of the firing cycle, and drops to a much lower number by the time the pellet arrives at the muzzle.

So, to achieve ~800psi of **average** pressure, the **initial** pressure has to be higher: 1000psi and up. And this is (the short version of) where those reservoir pressures in the 1000s of psi really come from.

Steve

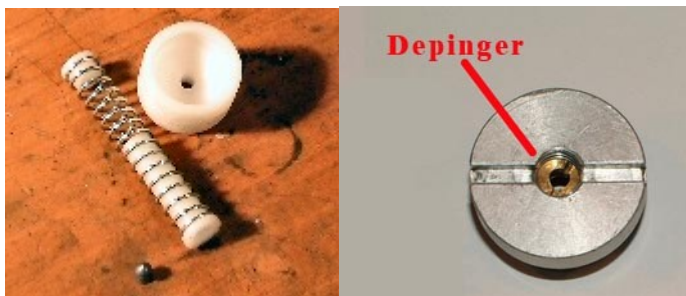
Depinger

drill press depinger

Ok after contacting a couple of forum members and then quit being so darn lazy I finally made a depinger for my MAC1 tuned b-51. I broke out the Delrin that I had saved for something that had been forgotten, turned it down with the drill press (3/16 hole in center) to a nice round baffle with a 23mm diameter, grooved it for the "o" ring for a tight fitting 26mm. drilled a couple holes for the 4 1/2 inch coat hanger supports. Man did this thing do the trick !no ping, just the hammer noise going home...click !The RWS 16mm is sure doing it's job too, wasn't sure until the depinger was installed.



Air Tube Baffle/DeTwanger and Hammer Spring Guide.



I'm in the process of making a De-Pinger to get rid of some of the standard PCP PING noise inside the air tube.



Scuba Fill



If you know how to do it, you don't need a regulator

But, if you don't know what you are doing and you have a 3500 psi Scuba tank, you could over fill your 3000 psi gun right quick.. This may also blast the brass filter in the fill port spreading brass slivers though out the air cylinder. The brass will end up in the firing valve!

In a nutshell, you fill SLOW.. 😊

1. Close the bleeder screw-valve and Mount the yoke on the tank (a little silicon grease should be on the tank O-ring).
- 1A. Open the valve a bit for about 1 second, to blow out any dirt etc in the hose and fittings. If dirt etc gets into the gun, it's going to make it leak down..
2. Close the tank valve, but NOT super tight, just so the air has stopped.
- 2A. MAKE SURE the bleeder is closed tight.
3. Click the QD onto the gun's fill nipple. (The locking collar must snap back down firmly).
4. Look at the gauge and 'very' slowly open the main tank valve.

5. Use the main valve knob to control the air flow into the hose & gun. The gauge should go up very slowly! If it's going up fast, shut it down slower.
6. Shut off the valve when the pressure reaches your fill point (2800 psi is good for a B50). You should try to fill the gun in about 45+ seconds. If the tube is warm, you filled too fast,
7. Open the bleeder. Turn it quickly. You will get a 1 second blast of air. (If you get 25 seconds of blasting air, you filled too fast and blew your check valve)..
8. Look at the gauge to insure it says Zero PSI before disconnecting the gun.

In step 4, When the hose is starting to pressurize, listen for a CLICK sound from the gun's check valve. You might also see a little dip in pressure. Take note of the gauge reading. That tells you what your pressure was BEFORE the new fill..

You might want to leave the bleeder open until your next fill..
So it's seal won't get mashed too flat.. 😊

You could calculate the Pressure at the elevated temperature

say the initial pressure is 3000 and the tank was filled and stable at room temperature of 70 degrees. This tank is then left in the sun where it reaches a temperature of 110 degrees. The pressure will now be at 3,267psi

Now if that same tank or gun was left in a car the temps can reach 150 degrees or more say worst case it is 200 degrees then the pressure will be 3,754psi. That pressure may be enough to blow the burst disk.

At the 150 degrees car temp the pressure is 3,462psi.

Formula used is this:

$$P2 = (((P1 + \text{Atmos}) * V1 * (T2 + 460)) / ((T1 + 460) * V2)) - \text{Atmos}$$

As volume is fixed in the above example it cancels out 460 gets the temperature into absolute degrees Atmos assumed at 14.3psi to get pressures into psia

Answer in psig (gauge)

Hope this helps and some find it interesting

If the gun is working fine when cold and you take

it out into the sun for a while, the pressure will go up some.

Last year, my wife opened a shade and my B50 got so hot that it was shooting at about VERY low power (100-300 fps).. I cooled it off in the basement and it was fine..

But, if your gun is not seeing any big temperature changes, you might have some heavy lube on your hammer and spring guide that is effected by smaller changes in temperature.. You should try to only use Dry-Lube or a VERY small amount of light lube on the hammer. If it's grease, it will drag down the speed of the hammer (and FPS)..

Using a Hand Pump

Haha! I don't think it's a 1,000 strokes, but it's a lot when you fill it for the first time.

When I started to get tired, I kept looking at the gauge, thinking it was broke! It took me 15 or 20 minutes of work, before the dial started moving.

Once the pressure is up around 1000 PSI, then it starts to go up a little faster. It seems like about 1 bar per stroke. On my FX pump (The BAM is a clone of the FX) I get about one shot per every two stokes of the pump..

So, after a fill to your sweet spot pressure (1800 to 2900 psi) (124 to 200 bar), you never shoot more than 20 or 30 shots before 'topping off' the gun. For 20 shots, you do 40 strokes and it only takes a few minutes.

But, if you shoot 80 shots, I hope you don't smoke.. 😊

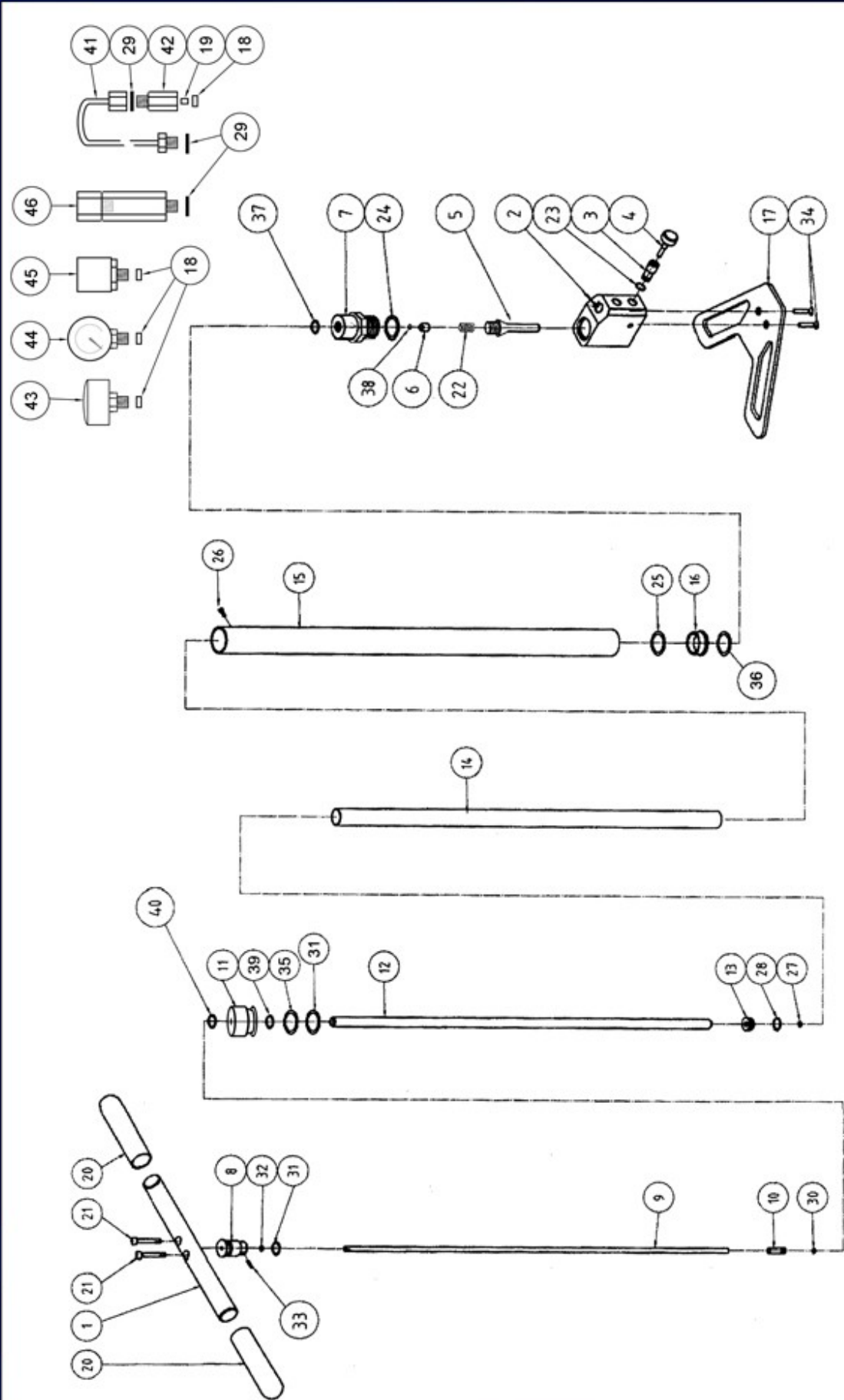
However, if you tune the gun down to 12 fpe, you can get 80 shots and not have a hard job ahead of you..

Just don't forget to rest and let your pump cool down.....

....about every 20 strokes or so. If you are able, in good shape, you can pump it full in one session.....but the seals on your pump will heat up quite a bit, lessening their lifespan. The advice I was given was to pause every so often and let the pump cool down a minute or two, then continue.

I've never had to pump over 200 strokes to fill any of my PCP's....but it's been awhile since I had to use a pump. Got a bottle instead.

FX AIRGUNS



FX AIRGUNS

NR	ART. NR	BESKRIVNING
1	1010	HANDLE BAR
2	1005	PUMP BASE
3	5002	VALVE SHELL
4	5004	VALVE SCREW
5	5009	VALVE PIPE
6	5000	MAIN VALVE
7	5012	MAIN VALVE HOUSING
8	1008	INLET VALVE HOUSING
9	1009	BAR 5MM
10	1004	HIGH PRESSURE PISTON
11	1003	LARGE PISTON
12	1001	HYDRAULIC PIPE 10MM
13	5001	BRASS CAP
14	1002	INNER TUBE 22MM
15	1012	OUTER TUBE 28MM
16	1000	THREADED BRASS CAP
17	1011	FOOTPLATE
18	5003	PLASTIC WASHER 4MM
19	1014	FILTER
20	1503	HANDLE
21	1017	SCREW M5x25
22	5204	SPRING 0.5x3x15
23	5005	PLASTIC WASHER 2MM
24	5103	O-RING 18x2.5 NBR90
25	5100	O-RING 23x1 NBR90
26	5200	SCREW M4x6 RUND
27	5104	O-RING 9.3x2.4 NBR70
28	5109	O-RING 11.6x2.4 NBR70
29	1511	RUBBER/STEEL WASHER
30	5107	O-RING 2.9x1.78 PUR90

NR	ART. NR	BESKRIVNING
31	5101	O-RING 20x2.5 NBR70
32	5110	RUBBERBALL 4.75 NBR70
33	1501	PIVOT PIN 2.5m6x24
34	5203	SCREW M5x10
35	5113	O-RING 20.24x2.62 NBR70
36	5106	O-RING 21.4x2.4 NBR70
37	5105	O-RING 9.3x2.4 NBR90
38	5111	O-RING 2.5x1.5 NBR90
39	1504	O-RING 4.42x2.62 NBR70
40	5112	O-RING 5.28x1.78 NBR70
41	5403	KEVLARHOSE 0.5M
42	5008	FILTERHOUSING
43	5401	PRESSURE GAUGE W
44	5400	PRESSURE GAUGE G
45	5007	ADAPTER
46	0150	EXTERNAL MOISTURE TRAP

ART. LIST

FX PUMP

REV.

EN 05.01

"O" rings and part numbers for the FX "Third Generation" pump

U-006 Urethane 90 durometer Part number 30
BN-009 Buna Nitrile 70 durometer Part number 40
BN-106 Buna Nitrile 70 durometer Part number 39
BN-117 Buna Nitrile 70 durometer Part number 35
23 x 1 mm Buna Nitrile 70 durometer Part number 25
2.5 x 1.5 mm Buna Nitrile 90 durometer Part number 38
9.3 x 2.4 mm Buna Nitrile 70 durometer Part number 27
9.3 x 2.4 mm Buna Nitrile 90 durometer Part number 37
11.6 x 2.4 mm Buna Nitrile 70 durometer Part number 28
21.3 x 2.4 mm Buna Nitrile 70 durometer Part number 36
18 x 2.5 mm Buna Nitrile 90 durometer Part number 24
20 x 2.5 mm Buna Nitrile 70 durometer Part number 31

The first four are Standard "O" ring sizes. The next two are regular Metric as well as the last two. The others are Japanese Metric, hence the 2.4 mm cross-section size. It is very important to install parts numbers 35 and 31 in EXACTLY the right sequence, or your pump will not operate properly. Lubricate them while installing and afterwards with diver's silicone grease. Do not use any petroleum based greases, PERIOD.

I could not get part number 37 in 90, so I used 70 in its place. It might not last quite as long, but until I can get the proper one, it will do. The most important one to get as shown, is the very first one. If you get anything else, it will blow out real fast, like in two or three fillings. Trust me on that one, lol. Hope this helps all of you.

Keyrigger

Where you really have to worry about rust is inside the cylinder, where you can't see it.

That's why most people like using SCUBA air, it's really dry.



Notice the little rusty looking finger prints on my barrel.. 😞 Those strange looking lines inside the tube are actually reflections of the slot in the valve head.. The inside of the cylinder should be bright and clean..

I used some silicon grease on the inside of mine, since I use a hand pump a lot.

Cocking the rifle



Thumb out on the left side, so I can pull it back towards the butt plate and not off to the right side.

The Swan-neck design of the BAM bolt handle is perfect. All I did to mine, is file off some of the sharp edges.

The B50 was easier to cock than the S400ERB. And since I've installed the lighter hammer spring, it's a LOT easier! 😊

my b50 doesn't cock

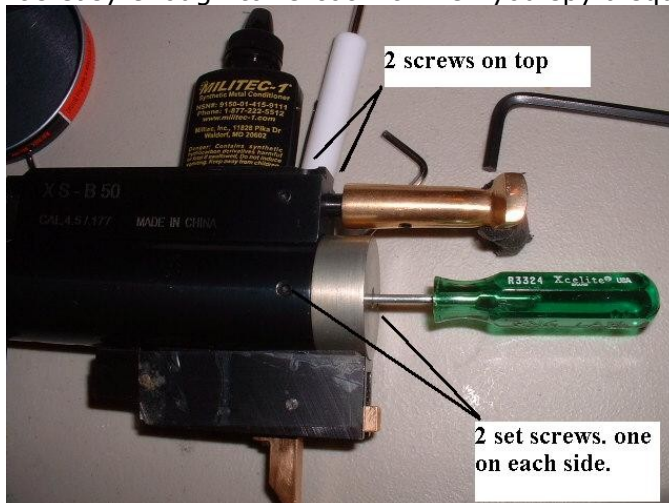
had that happen once, one of the screws holding the trigger block to the air tube was just ever so slightly loose, 1/16th of a turn tighter and it was never a problem again, it was the forward screw.

If you adjust the trigger much at all,

many times the safety isn't going to work real well..

My advice is not to trust the safety at all.. If you decide not to shoot after loading, it's simple enough to de-cock it..

It's easy enough to re-cock it when you spy a squirrel.. My B50 safety is in a box somewhere..

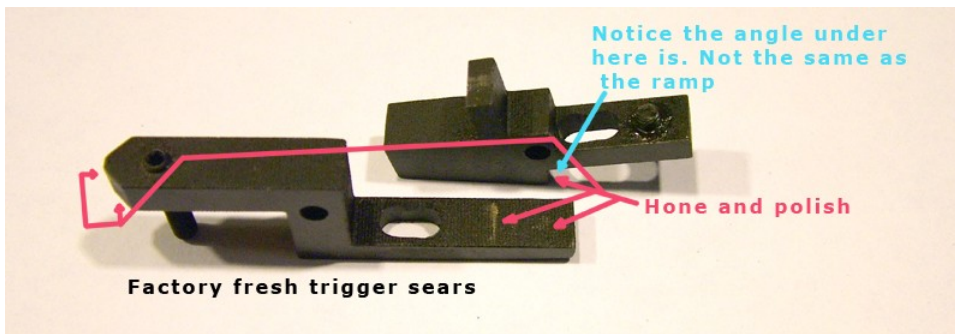


The hole where it used to be makes it real easy to adjust the power.. (after you mod the striker).

Disassembly of the trigger group

1. Remove the pin that hold the trigger in place. **Don't lose the spring.**
2. Remove the center pin. **Don't lose the spring.**
3. Remove the front pin. **Don't lose the spring.**
4. The short spring is the center spring incase they get mixed up.

The springs are not under great tension, but be aware that the springs are present.



Mac1's B50 Trigger adjust

I find Tim's adjustments work great and give an excellent trigger.

"Adjusting the Daystate/Chuntsman Trigger.

The front adjustment is the sear adjust. Cock the gun and turn that adjust in till the gun fires and then back it out a 1/4 turn.

The rear screw is the over travel and needs to be run in a lot if you want it to function as an over travel.

The adjustment in front of the trigger blade is the take up adjust. They use this mistakenly as the sear engagement adjust so once you get the sear adjusted you can set this for the amount of first stage

you want.

The screw right behind the blade is the second stage adjust. It needs to engage the sear to release the trigger just as the second stage is reached.

The adjustment of the two screws fore and aft of the blade will determine where the blade sits and how much first stage there is before it hits the second.

These triggers can be pretty damn good but the factory doesn't seem to have a clue how to adjust them so they come in any fashion that will catch.

Wouldn't "FREE MEN WITHOUT GUNS" be a RIOT?

Later

Tim

Mac1 Airgun"

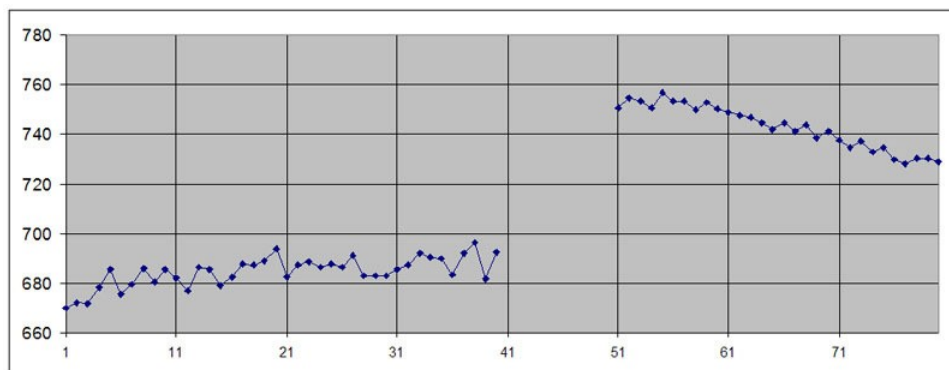
One point that Tim did not mention is that if the screw fore of the trigger blade is adjusted too much so the that trigger blade is too far back, the safety will not engage. On the other hand if there is too much travel before hitting the safety stop. That would not work too well either. With some settings, the trigger will go off even with the safety engaged.

I would adjust the screw fore of the blade first so the safety will just engage and back it off half a turn or so. Leave that screw alone for the rest of the settings. Than follow Tim's instructions. When adjusting the screw aft of the blade, keep at least enough first stage travel so as not to override the safety.

Yea - check this out

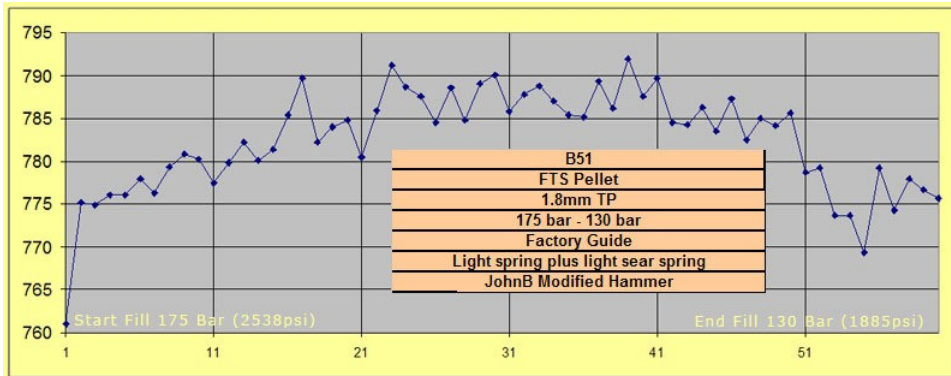
Answered my own question about resistance. A lighter hammer sear spring was installed. The first group is with the factory hammer sear spring. The second group is a lighter hammer sear spring.

Both groups started out with a fill of 135bar (1958psi). Going to have to rerun the pressure curve for the second group since it is out of the bell curve now.



Getting better

Higher starting fill. I think that it looks fairly good:



New B51 (long, w/ pics)

I got my new B51 on the 18th of January, 2007.



The first thing I did was clean out the barrel. It was full of brown goo, and took several patches, Goo-Gone, and Nevr-Dull to get it clean. After the patches started to come out somewhat clean, I switched to strips of Nevr-Dull wrapped around my cleaning rod to get any rust out and help to polish the barrel. Then I finished up with several dry patches and left it at that.

All the crap that was inside the barrel:



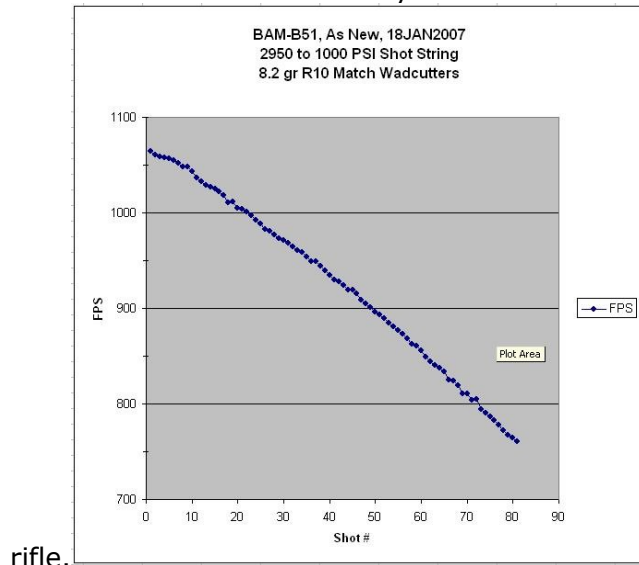
To facilitate cleaning, I pulled the bolt out of the receiver and the brake off the end of the barrel. First, I removed the little setscrew on the left rear side and removed the little spring and ball bearing (items 7, 8 & 9). These little items now reside in the parts bin as they didn't seem to do much. A quarter turn of the setscrew made the action go from not noticeable to bound up. I then removed the pin (item 5) that was screwed into the side of the loading bolt through the receiver slot. As I removed the loading bolt, I noticed it hung up in several places as the o-ring passed the sharp edges of the loading bolt bore.

I replaced the probe o-ring (item not shown in diagram) with a new one from the extra parts kit. The original was looking pretty gnarly, so while I was in there I threw a new one on. It didn't last long due to the sharp edges in the bolt slot. More on that later.

I put it all back together so I could test fire it out of the box. No sense in doing much work if there's something way wrong with it.

I then mounted a Simmons Pro-Air scope using BKL-263 rings. The scope has been modified to focus close since there's no way I can get 10 yards in my shop. It's my garage testing scope, but it can be changed back for longer distances easily.

I filled the B51 to 2500 psi (172.3 Bar) and sighted in the scope. All seemed normal, so I decided to go for a shot string to see how well it was performing. I filled to 3000 psi (206.8 Bar) and started to launch lead across the chrony. The results are poor, but consistent, so there should be hope for this



While shooting the chrony string, I noticed pulling back the bolt felt like the receiver was filled with sand. I pressed on, knowing that I could improve that, but I didn't want to do too many shots for fear of damaging something so I stopped at shot 80.

After the chrony string, I refilled the rifle to see how much air was left. The check valve clicked at 1000 psi, and I filled it back up to 2800 psi (193 Bar). I fired one pellet at 1072 fps (faster than the first, probably due to slight break-in) and left it for the evening, and to go read "the BOOK" of information collected by ChrisK.

The next morning, I fired it once before going to work. It shot at 934.6 fps. That night, I shot another and it was 854.5 fps. I guess I have a slow leak. I haven't attempted to locate it yet so I hope it's easy to fix. There's too much other fun stuff to do before I get to that!

The second night, I pulled apart the back end and proceeded to debur, clean and polish anything that looked like it needed it. After I pulled the back end off, I lost the spring and ball behind the safety. Man, that happened quick! I can't say I wasn't warned! I think it was Rich who said it would launch itself into another room. Mine's still in the same room (garage), but I don't know where! Oh well, I wasn't going to use the safety anyway.

There was a light sheen of oil all over everything, but it apparently wasn't much help judging from the feel of the bolt. I wiped off the excess and continued to pull things apart and inspect them.

I removed the striker guide pin (item 25) from the striker after removing the little setscrew (item 16) holding it. It looked to be loctited in with some brown or gray goo, but it came out fairly easily. I flipped it around and ground the screwdriver slot in it. Then I cut some copper disks from a piece of flattened copper tubing with a 1/8" chassis punch. These fit and worked perfectly! The height of the guide pin was 0.044" before I removed it, and I put it back the same for now. Looking back, I should have polished the tip of the guide pin to a mirror finish to keep it from hurting the valve pin.

Copper Disk:



I polished the striker outside sliding surfaces with 600 grit sandpaper wetted with isopropyl alcohol while it was spinning in the drill press, chucked on the small forward end. After polishing, I blued it with Birchwood Casey bluing cream and washed it off with hot water and soap. I doubt the bluing will do much other than show me where the wear points are.

I then polished the inside of the tube where the striker rides with the same 600 grit and isopropyl alcohol. I polished the slot the screw (item 26) rides in. JohnB says you don't need that screw, but I'll keep it until it comes loose and causes problems. I used my Medium and Fine diamond grit pocket hones to polish the slot, again using isopropyl. I washed out the tube with some electric motor cleaning spray intended for R/C cars. It's supposed to be safe on plastics, but I was still careful not to blast the valve pin area. After all the polishing I lubed the inside of the tube and the outside of the striker with moly paste. Bad idea on my part. It made the striker real slooow to move. I worked it back and forth to burnish the moly in, and then wiped the parts down with paper towels to remove almost all the moly. It seems to slide very freely now. I didn't do anything with the main spring seat (item 28), although I thought about polishing the part that fits inside the spring to help with cocking smoothness. I left the main spring seat dry when I reinstalled it.

I then went after the bolt and receiver issues. As I said before, the new o-ring didn't last very long at all. There are a lot of sharp edges that munched the o-ring. I grabbed my needle files and proceeded to round and chamfer anything I could reach. I then wrapped some 600 grit paper around a thin rod of Delrin with a slot cut in the end of it and polished the bolt hole, again with isopropyl. The bolt was starting to feel better already, but it still didn't feel quite right. I slathered a coat of fine clover grinding past on the bolt and o-ring (still the cut up one) and worked the bolt in and out a bunch of times. Then I cleaned it all up with the R/C motor spray and installed a new Quad Ring (QuattroSeal), which is like an o-ring with a square cross section. I lubed the bolt and it's bore with some light Teflon grease. Ooooooh Baby! It's as slick as butter now! The bolt slides in and out easily without the o-ring grabbing on the sharp corners, and it takes a slight push to get it the last 1/32 inch home when the o-ring seals up in the back end of the barrel tube. When it's cocked, I can flip the bolt and slide it in and out with light fingertip pressure. I can still feel a little bit of roughness, and I think that's from not polishing the long slot on the bottom of the breech where the hammer cocking pin rides.

New QuadRing Bolt Probe Seal:

	<p>http://www.mcmaster.com #6540K116</p> <p>AS568A Dash Number 006 Type O-Ring Cross Section Shape Double-Seal Width 1/16" Actual Width .070" Inside Diameter 1/8" Actual Inside Diameter .114" Outside Diameter 1/4" Actual Outside Diameter .254" Material Viton Viton Type Double-Seal Durometer Hard Durometer Shore A: 75 Temperature Range -15° to +400°F Color Black</p>
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I took apart the trigger assembly. There isn't much to it. Pull the pins from back to front, removing each item as you remove its pin. There is a spring for each piece but they aren't under much tension. The shorter spring is in the middle (trigger lever), the other two are the same length, although the "BOOK" only shows one as #57, the other has no number. You should be able to push the pins out with a punch. No hammering needed. I didn't do any work to the trigger, just put a little bit of moly past on the wear areas and on the pins. I'll go after that later. Removing the trigger parts helped get the feel of how well the hammer slides inside the tube.



I tried to straighten the trigger a little by tapping on it while it was over the rounded horn part of my anvil. I thought I had done some good, but it still looks severely hooked. I think to anneal brass you heat it dull red and quench it. Some day I'll try it again. For now, I buffed the brass to a nice shine.

I noticed the bolt handle had sharp corners that cut into my fingers a little when cocking it. I rounded the sharp edges slightly with fine sandpaper and buffed it smooth and shiny with the buffing wheel. Much better.

I'm having a great time working on this rifle. That's the main reason I bought it, to work on it. I expected "functional" and that's what I got. I still have to find and fix the slow leak and build and install a depinger. I made a muzzle brake out of Delrin that appears to have some promise thanks to ChrisK. I bought a bunch of replacement screws at Ace Hardware yesterday. I also bought a 3mm tap since one of the item 4 screws showed evidence of bottoming on the threads (flattened and shiny last

2 threads).

Hope you enjoyed my ramblings...Jim

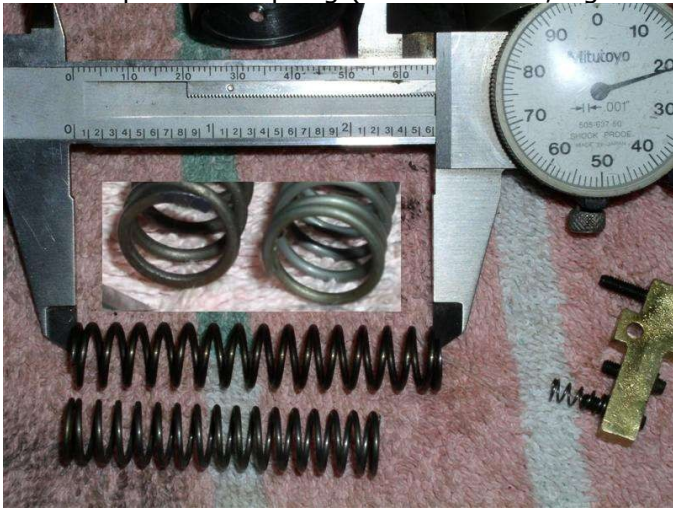
John, the Quad Rings are..

available at most hydraulic supply shops. I bought a box with a bunch of different sizes for \$30, and I've used several in different applications already. I have also bought singles from the same place, actually, he gave them to me since they were so cheap and I bought some other stuff. The Crosman 760 uses a quad ring seal in the air chamber, which is why I found them in the first place.

The pic of the seal is sitting on top of the box it came out of, with the number of the seal part shown along with the ID and thickness. With that, you should be able to acquire one. My box says "Quattro-Seal", nitrile, durometer 70. Sitting next to it is obviously the old seal, but that was actually the replacement that only had 80 shots on it! Those sharp edges sure did a number on it!

I don't have "the" light spring from McMaster, although I may be able to get one from Mark Checkmarks if he has an extra. I did find a spring that looks really good, but I just tried it and I have valve lock, probably 2700 psi right now. So I put back in the original spring until I can get her shot down to a lower pressure.

Here's a pic of the spring (the lower one, right in inset) I found in my junk box:



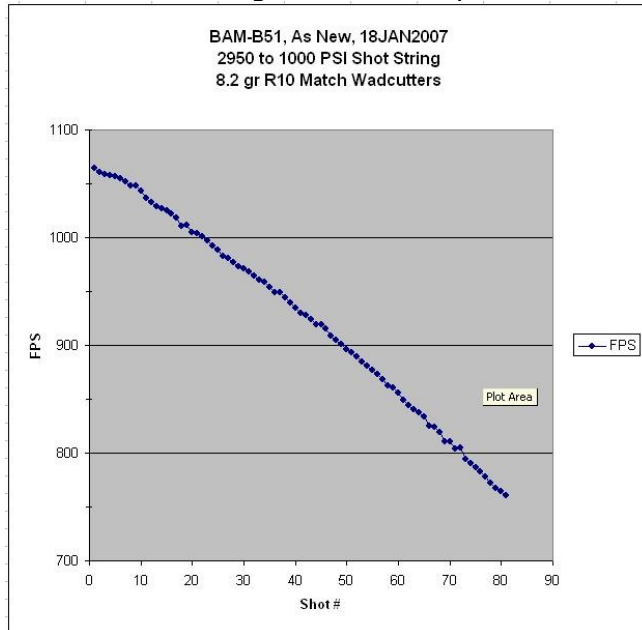
The ID is perfect, but the length is a little shorter. It's a lot softer. When I tried it, all I got **was a** thunk, and the pellet didn't move. Valve lock.

For your trigger slop, is it just the hole in the trigger? If the holes in the side plates are good, try finding a piece of brass tubing at the hobby shop. You want the ID to be at or slightly smaller than the original pin. Drill the hole in the trigger to fit the OD of the brass tubing and solder it in, or use loctite or JB weld to hold it. Then slick out the hole in the trigger for a perfect fit on the pin again. I've rebuilt cuckoo clocks with worn bearing holes with this method.

Jim

How do I level this shot string out?

Here's a shot string I did when my B51 was brand new out of the box:



Looks like one side of a mountain! How should I go about leveling it out to get the proverbial "inverted bathtub" response?

I modified the striker pin with a screwdriver slot, and put a copper disk under the setscrew, so I'm ready to start adjusting. But I'm not sure if that's all it's going to take.

This is my "inside gun" for a while, so I'd like to have 850 or 900 fps w/ .177 cal 8.2 gr wadcutters. As many shots as possible, and as low a fill pressure as possible to conserve scuba air (and not have to pump!).

My gut feeling tells me to run the screw in so it hits sooner, which should drop the velocity. But will that level the curve out too? Or is there something else I should be doing, like changing the size of transfer ports, or changing the weight of the hammer, or changing the spring?

Re: How do I level this shot string out?

I would try turning that Striker screw out before fooling with the transfer port or hammer spring.

The velocity of new guns will vary, so you might have the range to get it down to 850-900..

But, after you make the adjustment, don't put in a max fill. Just fill it up to 2000 PSI (137.9 Bar) and see what the adjustment did.

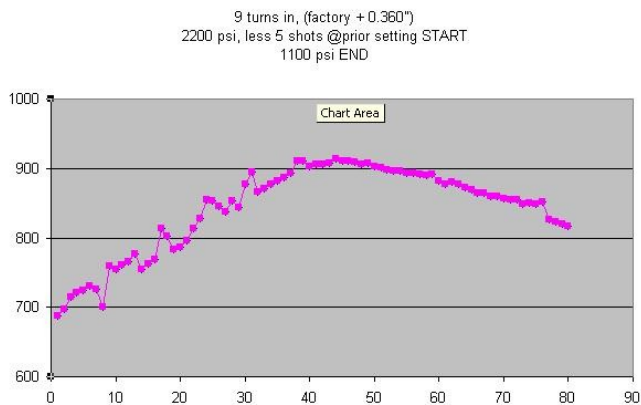
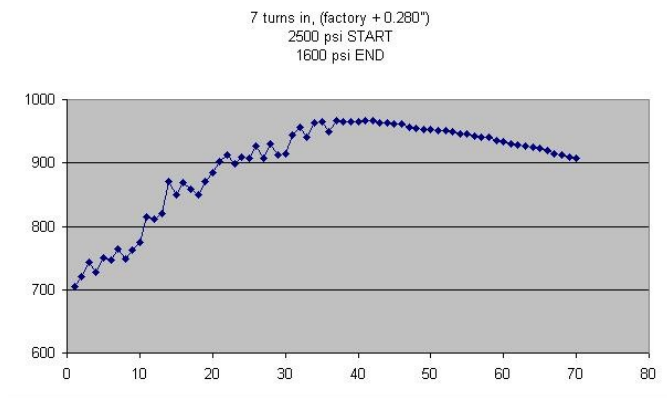
If you are seeing a flat curve, or it's going up, you are in the ballpark.

The hammer action and spring may smooth out some after you shoot a tin or two, so don't expect the velocity curve will stay the same as before break-in. It may need re-tweaking. 😊

B51: New Strings after adjustments - still not right

I guess I'll have to get me a different spring. Actually, I begged a couple samples from Century Spring today! 😊

Here's my results from adjusting just the striker pin distance (still using the stock spring):



Not quite what I was looking for, but getting closer. Why is the upslope ragged like that? I found it kind of odd...

When I had it cranked in 9 full turns, the spring was under a lot more tension in the fired position, and pulling the bolt back is free for 3/4", then the last 1/2" is tough until it latches the hammer. I'm not happy with that. It just doesn't seem right.

I did try my lighter spring I have with a 1200 psi fill (82.7 bar) (1300 psi (89.6 bar) locked, dangit!). I was quite impressed with the results, although the velocities were lower than I wanted. I was hitting 660 fps for a LOT of shots (like 60 or more), and getting bored in the process. I plan to whip up a brass spacer on the lathe tonight. It will be about 3/8 thick, ID of Spring Guide, OD of Hammer Tube. My light spring is shorter than stock, and I've been backing out the striker pin screw from factory settings to get where I want. I'm thinkin' the shorter spring could use more tension (more fps) and the hammer could use more weight (more fps), so hopefully I'll be in the 800+ fps range with low pressure fills.

Still cold here, and now we're supposed to get more snow this weekend! Glad I got lots of raw materials, a lathe, a little spare time, and my B-fitty-one to work on!...Jim

CHECKING VELOCITY

1 Use a reliable chronograph to check velocity, (the formula below requires the reading to be in feet per second - FPS)

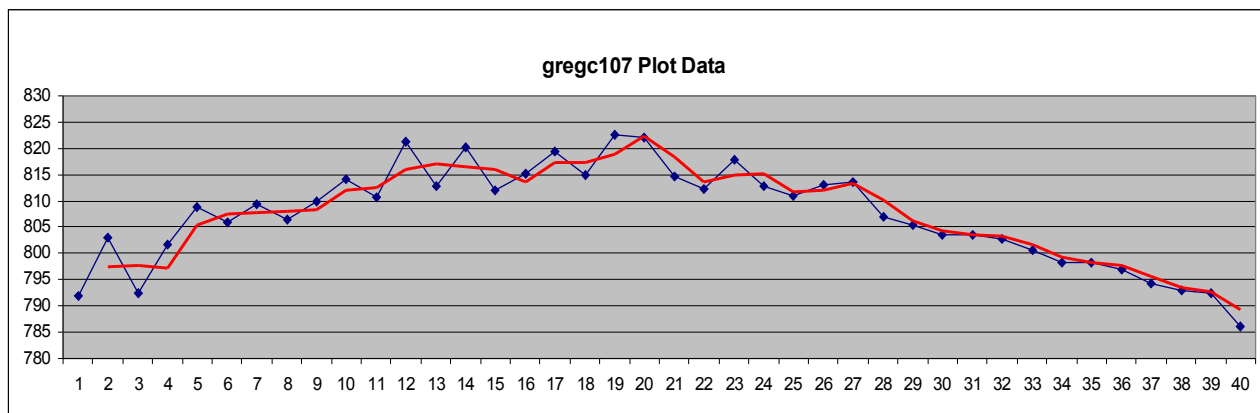
2 Use fine measurement scales to weigh the pellet, If scales are unavailable the pellet weight may be stated on the pellet

container lid or contact the supplier. (The formula requires the weight to be in grains). To convert from grams to

grains multiply by 15.432, i.e. 0.69 grams x 15.432 = 10.65 grains.

3 To find the muzzle energy in ft/lbs use the formula (FPS x FPS x Grains) / 450240, i.e. (700 x 700 x 10.65) = 5218500 divide by 450240 = 11.59.

Tuning Data and Plots



Note: The chart above reflects the 40 shot string below from the low 796.61 fps - the high 822.68 fps

Here are my 40 the shots below:

XS-B51 .177 caliber with McMaster-Carr Spring Modification & Beeman Kodiak 10.6gr(match grade)
Non-Modified Spring Guide
Non-Modified Hammer Assembly
Non-Modified Transfer Port
Chrony set 5ft from Muzzle
Date: 11/28/05
Time: 3:30p
Temp: 50 Degrees/Garage
Dist to Target/Trap: 10m @ Diagonal

STRING 1

791.84
803.09
792.52
801.65
808.94
805.97
809.42
806.46
810.02
814.21

LO: 791.84
HI: 814.21
ES: 22.37
AV: 804.41
SD: 6.99

STRING 2

810.78
821.4
812.9
820.12
812.08
815.26
819.45
815.04
822.68
822.12

LO: 810.78
HI: 822.68
ES: 11.90
AV: 817.18
SD: 4.24

STRING 3

814.71
812.36
817.73
812.74
810.99
813.12
813.5
806.94
805.33
803.46

LO: 803.46
HI: 817.73
ES: 14.27
AV: 811.09
SD: 4.24

STRING 4

803.67
802.82
800.64
798.21
798.21
797.00
794.18
792.98
792.31
786.08

LO: 786.08
HI: 803.67
ES: 17.59
AV: 796.61
SD: 5.08

Various Air Cylinder Sizes CC

Air Arms S200 122
Air Arms S400/410 carbine 180
Air Arms S400/410 standard 200
Air Arms S400/410 extra 220
Axsor 202
Axsor carbine 129
BAM B-50 or B-51 196.3
BSA Superten 200
Career 707 rifle 400
Career 707 carbine 230
Daystate CRX 173
Daystate Harrier 167.3
Daystate Huntsman (post'94) also BAM 196.3
Falcon 8" barrel 55
Falcon 12" barrel 80

Falcon 19" barrel 140
Rapids - 280cc buddy bottle 280
Rapids - 400cc buddy bottle 400
RWS standard rifle 196
RWS carbine 142
Venom Viper 164
Webley FX2000 202
Webley FX2000 carbine 129
Webley Raider 164

http://www.klickcue.com/air_rifle/b50_51/technical_details_for_adjusting_the_bam_b50_51.pdf