

Rebuilding a Theoben Eliminator Gas Ram

Firing behavior:

It takes no effort to cock the gun. It does not shoot. A pellet does not exit the muzzle.

Professional tune or DIY:

You can send the gun to airgunwerks or airgun-usa for a \$100 service fee. You will need to pay shipping both ways. After all is said and done the cost will be close to \$200. Turnaround time could be up to 2 months.

The following steps will teach you a skill to work on these gas ram guns. Additionally, you will not need to pay \$200 or wait for months for the gun to come back to your home.

If you want to pursue the DIY route, read on:

Step 1:

Replace Schrader Valve Core:

Purchase either Brown Viton or White Nitrile valve cores from Schmidty Racing (in the US). Do not purchase Schrader valve cores from amazon, as they are only rated to 500PSI. You will need a valve core that is rated 1000PSI or greater.

<https://www.schmidtyracing.com/Schrader-Valve-Cores-p/n-ft-shr-c.htm>



Purchase valve core remover tool:

1. Remove valve core plug in back of ram.
2. Depressurize ram by tapping on existing valve core until all air is released. A small Allen wrench will suffice.
3. Remove valve core with valve core remover tool. Pay close attention to tension used in removing core. You will need to use the same tension screwing the new one back in.
4. Insert new valve core with same amount of tension applied.
5. Use Brocock pump and adapter to pump up ram to about 40 pumps. For a .22, you should see chrony #'s in the 400fps - 600fps range.



6. Try firing gun over chrony. If the chrony registers, try another 10-15 pumps until you reach the desired velocity. For a .22 with a 21 grain pellet, 775fps equates to 28fpe. Expect to pump 80-100 times to reach your desired velocity.
 - a. Fpe calculator:
[https://www.pyramydair.com/article/What is Muzzle Energy August 2003/5](https://www.pyramydair.com/article/What%20is%20Muzzle%20Energy%20August%202003/5)
7. If you experience a sharp drop in velocity, the ram might need to be rebuilt. i.e, going from 665fps to 610 then 580 in a matter of 10 shots.
 - a. You can try another valve core if you bought more than one. In my experience the result will exactly the same: you need to rebuild the ram.
 - b. It is very unlikely the new valve is faulty. Schmidy racing said they have never experienced a return due to a faulty valve core they have sold.

If the ram holds the same pressure after a few days, then you have fixed the problem. Enjoy your gas ram rifle.

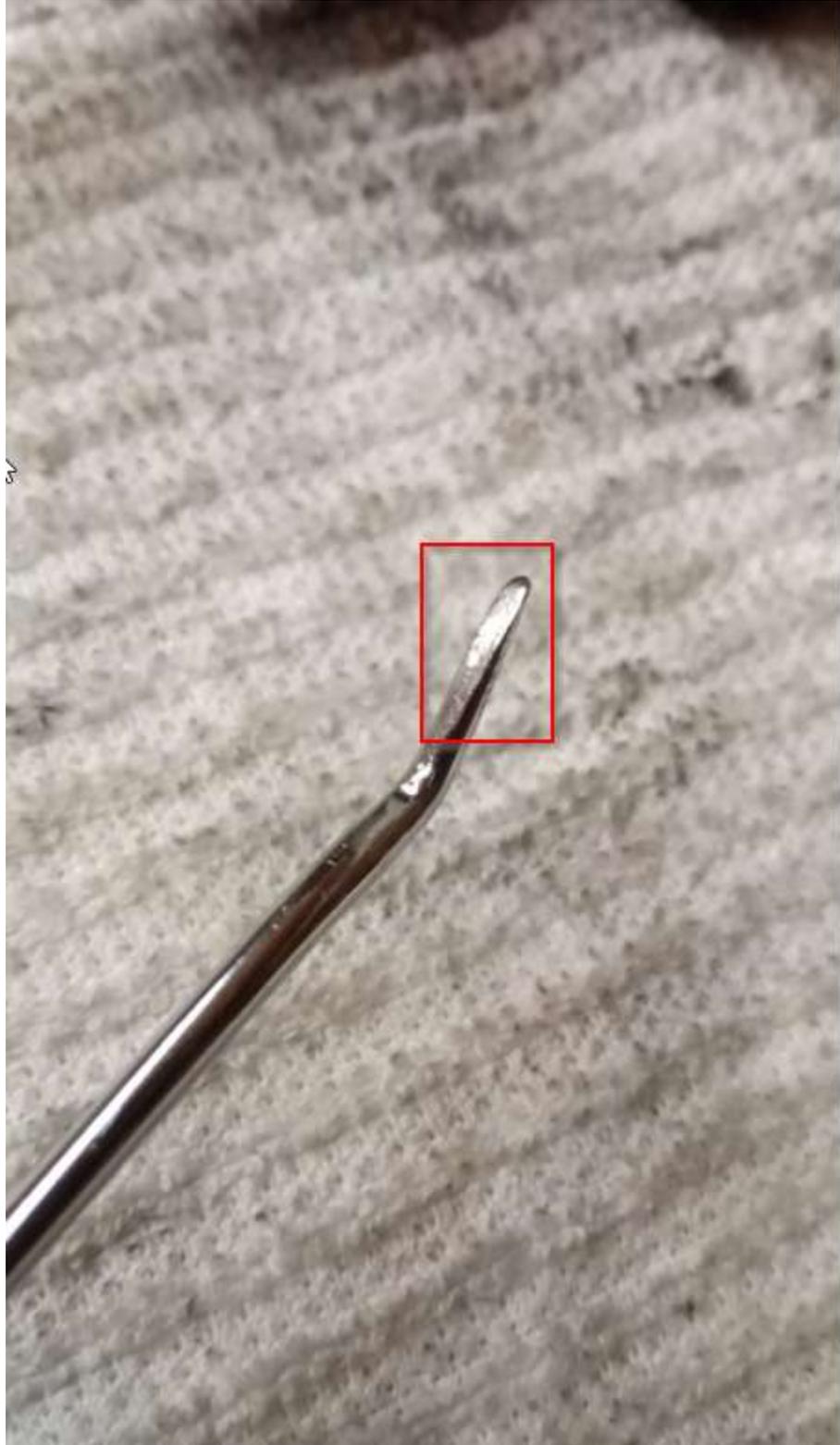
Rebuilding the Ram:

1. Remove stock from action. Allen wrenches were the only tools I needed for this step. You will need four different sizes in all.



2. Depressurize valve core with Allen wrench. This means tap the valve stem until all air is released.
3. Remove Schrader valve plug using valve core remover tool.
4. Purchase hook and pick set:

- a. https://www.amazon.com/TEKTON-6943-Precision-Pick-4-Piece/dp/B000NPPBQK/ref=sr_1_1?crid=1QCMUV971U0TP&dchild=1&keywords=hook+and+pick+set&qid=1591073469&srefix=hook+and+pic%2Caps%2C238&sr=8-1
- b. You will only need one tool out of this set: The 45 degree implement.



- i. Grind inside of tool to make it flat. A Dremel tool can easily accomplish this task. This tool is especially important when removing the retaining ring in the ram.

5. Remove barrel and cocking arm.
 - a. While holding cocking arm parallel to receiver tube, place barrel perpendicular to receiver tube.
 - b. Unscrew barrel detent by $\frac{1}{2}$. Do not completely remove grub screw.



- c. Apply clamp to push barrel detent $\frac{1}{2}$ down.



- d. Remove Barrel and cocking arm as a unit. Be very careful to not damage the cocking shoe. Do not attempt to cock and fire the gun without the action in the stock!
6. Remove valve core.
7. Remove large o-ring from back of receiver.



8. Remove snap ring holding the ram in place. Depress ram so you can grip the snap ring with the snap ring pliers. Earlier versions had a cross pin to retain the ram.



- a. Do not buy the cheap snap ring pliers. I tried this, and it was a nightmare. The dimples were too shallow, resulting in the dimples slipping out of the holes constantly. The channellock version are the snap ring plier to purchase:
 - b. https://smile.amazon.com/gp/product/B000TG80SY/ref=ppx_yo_dt_b_asin_title_o05_s00?ie=UTF8&psc=1
9. Remove ram from rifle. You can use a flat blade screwdriver to push it out where the cocking shoe is located. You might have to manipulate the trigger unit to create room.



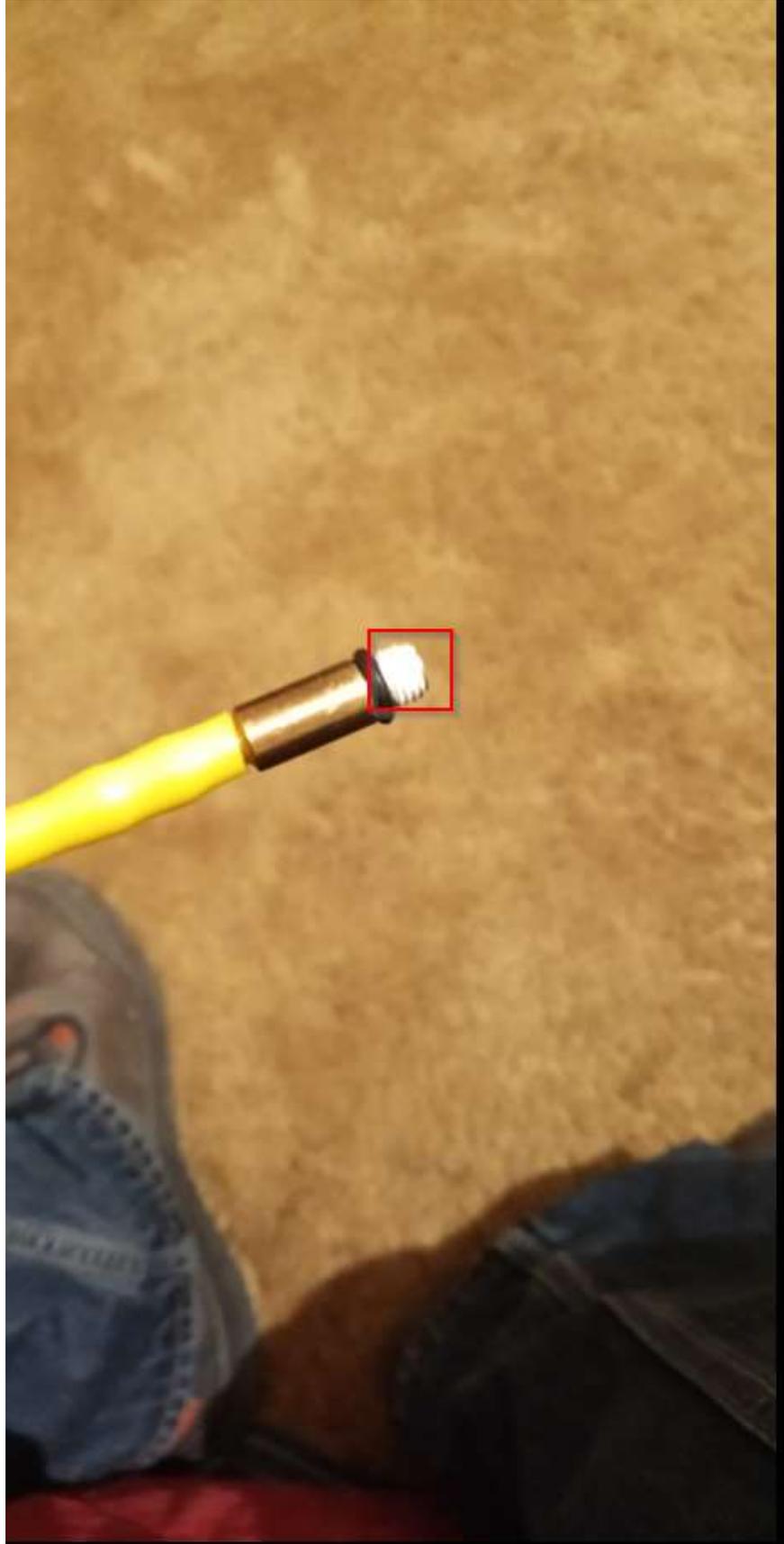
10. Replace two rings in front of the ram with Buna o-rings. My front ram o-rings did not need them replaced.
11. Remove retaining ring that holds the two units of the ram together. Depress ram to access retaining ring.



- a. O-ring Hardness in the ram is 70A durometer. My eliminator required: 13/16" ID x 1" OD x 3/32" CS 70A Duro Nitrile O-ring.
- b. <https://www.ebay.com/itm/13-16-ID-x-1-OD-x-3-32-CS-70A-Duro-Nitrile-O-ring-Bag-of-10117/392249506080?ssPageName=STRK%3AMEBIDX%3AIT&trksid=p2057872.m2749.l2649>
- c. I used synthetic grease as an o-ring lubricant:
- d. https://smile.amazon.com/gp/product/B0083R1FME/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1
- e. Pour one teaspoon of motor oil in ram. I could not remove the inertia plug:



- f. Replace ram rod in cylinder.
 - g. Re-insert retaining ring.
12. Pump up ram to approximately 20 pumps while ram is under water.
- a. If you cannot find a Theoben slim jim pump: <https://www.bestfittings.co.uk/product-brands/theoben/>
 - b. If air keeps escaping out of valve entrance, use Teflon tape to create an air-tight seal.



c.

- d. <https://www.youtube.com/watch?v=f7mijzfB9Ec>
- e. If the hydraulic tubing detaches from the brass fitting while pumping, you will need to purchase a needle driver insertion tool. Cut the enlarged end off, and start from new tubing. You cannot re-attach the hose by hand or vise-grip (along with heating end in boiling water). Already tried.
- f. When re-inserting the hydraulic hose back into the barbed fitting, make sure the locking nut is behind hose. The nut will not fit over the barbed fitting with hose installed. Otherwise, you will need cut off another section and start over.
- g. https://smile.amazon.com/LDQIDAO-Upgraded-Insertion-Bicycle-Hydraulic/dp/B07THL396T/ref=sr_1_5?dchild=1&keywords=Needle+Driver+Insertion+Tool&qid=1599335173&sr=8-5



h.



i.

- j. Once ram is verified to hold air, depressurize completely. You will not be able to insert a fully extended, pressurized ram back into the receiver.
13. Once Reverse order of these instructions to put gun back together.
- a. Apply moly-to-moly paste on exterior of ram contact points.
 - i. [https://www.pyramydair.com/s/a/Air Venturi Moly Metal to Metal Paste 1 oz/3498](https://www.pyramydair.com/s/a/Air_Venturi_Moly_Metal_to_Metal_Paste_1_oz/3498)
 - ii. Make sure to manipulate back of trigger housing if the trigger does not move in the safe or fire position after inserting ram. It should feel like a very short two stage trigger. If you have another theoben gun, test the trigger on that gun “at rest”. The rebuilt gun trigger should exhibit the exact same feel. Otherwise, the gun will not fire when cocked. This means you will need to de-pressurize the ram, and take the gun apart again until the trigger issue is resolved. Already happened to me.
 - iii. If you experience air escaping from the Schrader valve entrance, try another valve core. If you are still unsuccessful, try pipe dope on the threads. Yes, I had to do this:
 - 1. https://smile.amazon.com/gp/product/B000DZH938/ref=ppx_yo_dt_b_asin_title_o03_s00?ie=UTF8&psc=1
 - 2. Apply Teflon tape then pipe dope over the tape on the valve core if still unsuccessful.