

# TUNING THE MARLIN



Having picked up another stainless Marlin .44 recently, here are a few of the things that I did to slick up the action before next season starts. Before working on any firearm make sure that it is clear, and that all live ammunition is locked away securely in a cabinet. As the rifle had already belonged to someone else it was a lot easier to see which areas would need work on as small wear marks and burrs were visible on the individual components inside the frame. Having completely stripped down the rifle the first thing I did was bend in the loading gate slightly to reduce the spring pressure to make reloading easier. I then took off the small plate and smoothed over the edges at the front, then gently filed the inside edge (1) of the oval hole in the receiver. This will greatly reduce the chances of any finger slicing in the future. Make sure that you apply some Blue loctite to this screw when refitting as they are very prone to coming undone and jamming up the rifle during the cycling action. Next I used a small wet stone and rubber sanding block to clear up small burrs that I found on the inside walls and top strap of the frame (2) whilst some fine wet & dry wrapped around a lollypop stick was ideal to get into the narrow slot that the bolt travels along. Remember that you should simply remove burrs or high points to reduce any friction between two parts then finish off with simple polishing.



Removing too much metal or excessive polishing will increase the material contact area, resulting in increased friction, so be careful!

The next part I looked at was the ejector and a bit of time spent on this will produce a noticeable reduction

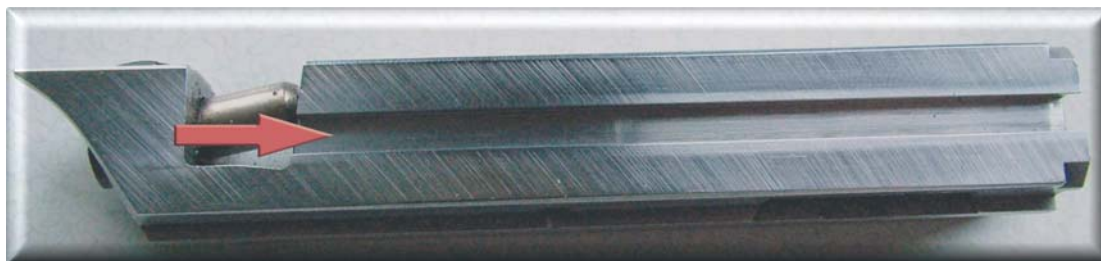
in the manipulation force required to operate the lever. Placing a small screwdriver midway between the two parts, I then bent the thin spring inwards slightly to reduce the spring pressure. Next, the edges and small burrs were smoothed over on the part that slides inside the recess of the bolt then it was finished off on a polishing wheel. Although it was polished, I didn't alter the height or angle of the small lug on top which contacts the rim of the cartridge as this would cause jamming or cycling problems. Care should be taken to apply a small bend on the spring to start with and then check the ejection/functioning using dummy rounds (clearly marked and with no primers in). The empty cases only eject around 6 – 8in or so out of the side of my rifle now but it works

every time and has no hang ups at all.



To work in conjunction with the ejector the next step was to deburr and polish the slot that moves over it, along with the top and bottom surfaces of the bolt. I

then used some very fine wet & dry wrapped around a small flat file to lightly smooth inside the recess where the lever locates. A sharp blade was used to slightly bevel the edges of the holes where the various pins are located to eliminate any binding and I then used a fine rubber block to smooth over a few burrs on the small lug that rides over the top of the hammer.



Great care should be taken to ensure that the height of the block is not reduced as this will render it impossible to reset the hammer during cycling! The firing pins were also removed and the hole they locate in was lightly stoned to reduce internal friction which will also help improve primer ignition. I did not alter in any way the face of the bolt or the firing pin hole where it protrudes from as this area should only ever be modified by a competent gunsmith. Installing a one piece firing pin will actually slightly reduce the closing force of the lever, as the locking block has to push the rear pin upwards against a small spring to align them both in order for the rifle to fire.



The locking block also had quite a few rough surfaces and particular attention was given to the sides where it rises and falls inside the frame.



*The locking block*



*10/22 hammer spring = Fedral primers*

Modifying the hammer and hammer spring will also substantially reduce the effort required to rack the bolt back and if done properly will provide a very smooth action that should help you shoot better on the range. Starting with the hammer, the first thing that I did was remove the burrs from one side of the hammer where it had been binding against the frame slightly. I then de-burred the edges of the strut that the spring fits over, along with the hammer screw and the hole that it locates in and finished of with some light stoning around the arc of the hammer as it had quite a rough finish on it. I then polished up these areas and put the rifle back together again ready for the next step which was to re-profile the hammer. The most important thing to do before you start removing any



metal from this part is to cycle the bolt slowly rearwards and watch exactly what happens to the hammer during the operation. As the bolt moves back, the lower edge contacts the face of the hammer and starts to rotate it through its arc. You will then notice that the small lug on the bottom of the bolt then takes over and continues to ride over the top of the hammer. At this point listen carefully and stop moving the lever as soon as you hear the sear engaging. You will be able to see exactly how much excess material on the nose of the hammer can be removed safely. I then simply used a

***Check then double check for best results***

marker pen to draw a line level with the lug at the sear engagement point, and marked out a profile just above this point to give a “softer” arc line that could be followed on my bench grinder. Light pressure against the wheel and moving in a constant rolling motion will give the best results on a wheel. However, access to a flat edged belt sander would give an even better result as the hammer could be laid flat against it instead of it having to be held “square” by hand. Once the hammer nose had been polished up, I install it back into the rifle and again went slowly through the cocking action to see if it needed more



*A standard*



*and modified hammer!*

material removed but as it was, everything was ok. The common sense approach for anyone doing this for the first time would be to mark out and remove a small amount of metal, polish it, refit it back into the action then test the results. Then, simply repeat the process re-marking and making slight adjustments to the area to be profiled. Although it may take quite a few attempts to get it just right, remember removing metal is easy! Adding it on the other hand is a whole different problem! Combined with this re-profiling I changed the standard hammer spring to one that resembles a Ruger 10/22 piece that I had lying around in the shed. It just means I have to use Federal primers to ensure reliable ignition, but it's all I've ever used anyway, so no change there! As well as helping achieve a very slick action it also decreases the trigger pull weight dramatically as it reduces the holding pressure on the sear. It's well worth trying different springs you have lying around and testing them on the range as you can always cut them to length, or simply add a small washer at each end until you get perfect reliability. It's also much cheaper than some "performance kits" out there whilst achieving at least the same, and more often than not a better result!

Moving on to the carrier (or lifter as it's sometimes referred) to and all I did with this part was de-burr the pivot hole (and screw) and the two flats either side, and very lightly on the side holding the plunger where the lever makes contact. It is crucial that no metal is



removed from the nose of the carrier as this will cause major jamming problems, and although the cradle that the cartridge sits on was slightly burred, I also left it alone as removing too much metal from this area will cause feeding problems. All that was required then was a quick polish up on the buffing wheel.

The next job was to remove the plunger from the lever, polish the v shaped end that locks over the pin in the frame, and replace the small spring inside it with a weaker one sourced from an old pen. The standard spring holds the plunger under quite a bit of tension. Finding a suitable replacement (or taking coils off the old one) takes a bit of time and effort to get the lever to stay closed



properly but is worth it in the end. The lever on this rifle had some quite large scrape marks either side of the plunger housing where it has caught on the inside of the frame when closing the action. Running it over some fine wet & dry paper placed on a flat bench soon sorted out the problem though.

The last thing to do was relieve some of the tension on the trigger block safety spring by placing a flat ended screwdriver under the looped end and prying it up slightly so that the lever will close easier. The relevant parts were then oiled up and the rifle put back together and function tested. The action certainly felt a lot smoother cycling through some dummy rounds and the trigger pull weight was a lot lighter with the new spring installed. All that's left now is to test fire it at the range to check for reliable primer ignition.



*Trigger block safety spring*

Modifications on my own rifle that I have shown above is for reference only and any work that you carry out on your own firearm is your responsibility. If you are not familiar or competent with the basic functioning of firearms then seek advice or modifications by a reputable gunsmith.