Restoring a Lee Enfield No1 MkIII*

Introduction

As I work on Lee Enfield's in one form or another almost on a daily basis I tended to avoid writing an Armourers report on these rifles I regarded them as mundane. However I notice there are less Lee Enfield No1 MkIII's in circulation now than previously, parts are becoming less plentiful and prices are rising, therefore as this No1 was going to be a little different, therefore I thought it was time to produce a report.

In the UK the Short Magazine Lee Enfield (SMLE) No1 MkIII is commonly referred to as the "Smelly". This particular Smelly was manufactured by BSA in 1918 and is the MkIII* model which was the most prolific of the World War One Enfield's. Production of these fine rifles continued in one form or another with the Australian Lithgow company until 1956 and Indian Ishapore versions until 1974. The MkIII* differed from its earlier cousins with the absence of the magazine cut-off, windage adjustable rearsight's and the volley sight assembly.

I initially purchased this rifle as stock and planned to restore the rifle and sell it on. Purchased in the UK in 2014, the rifle was part of 10,000 No1 and No4's sent to re-arm the Italian Armed Forces after the end of hostilities in 1945, details can be found at the following lInk; http://www.euroarms.net/EFD/introduction.htm

Although the rifle had accumulated seventy years of muck and debris, mechanically it was in excellent condition and had a superb bore, except for some damage to the butt, the rifle was in good condition but otherwise was generally unremarkable as Smelly's go, which was exactly the reason why I choose this rifle for this particular project.

History

Before we go on I will describe the restoration process and some technical aspects of this rifle but I will not discuss the rifles history or variants as there are books galore for the interested reader to peruse. Some points I will add to help set the scene and at one point it is worth remembering that these rifles and especially the earlier models were manufactured in a time before mass production and were built and assembled by craftsman. The needs of world war one introduced effective and wide scale mass production into the United Kingdom and the MkIII* was a classic example of that industrial process. Build quality was still exceptionally good and it is that build quality that permits these rifles to be restored to their prime today. However whilst excellent combat rifles, the split bridge design of the receiver makes mounting a scope effectively a fairly difficult process and for the reader who studies SMLE's they will be aware of all manner of side mounts that were used to overcome this problem.

The SMLE is one the best infantry combat rifles ever produced but in its own period and certainly by today's standard, it was a fairly complicated design and to reproduce today would be very expensive.

Build Specification

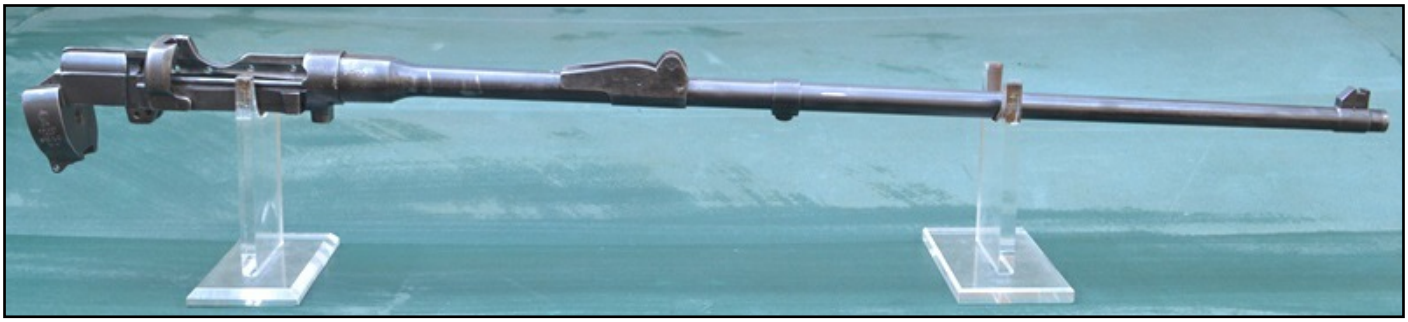
Although my original plans were to restore and sell this rifle on, I had at one stage considered the rifle to be a donor to fit a Winchester A5 scope. I had planned to replicate a set of side mounts and fit the scope but this project waned with the difficulty of finding an original A5 scope or fitting an expensive replica and therefore I went back to the original plan of simply restoring the rifle.

That decision was changed by the acquisition of a unusual Parker Hale scope mount that I found on EBay. The RFD seller stated that the scope and mount had come of a SMLE but I don't think the seller was being entirely honest, as the mount was fitted with an old Zeiss scope that only had elevation adjustment and the mount had no provision for windage, therefore the shooter would find it almost impossible to zero. The mount may have come of a SMLE but I find it hard to accept that the zeiss scope was part of the original package and I think that this particular scope was added to increase the overall sale value and I fell for it and felt cheated as a result. However not all was lost, the Zeiss cleaned up well and was a good quality scope from between the wars and

is now part of my scope collection, the mount was designed for a SMLE but possibly as sporter model as the rings are 1” which would indicate post WWII. However I will discuss the mount in more detail in a later section.

Receiver

As SMLE’s are generally the oldest of the Lee Enfield's it is logical that they are more likely to suffer from the most wear & tear and therefore it is critical you inspect the receiver for this problem. The easiest way is to pull the bolt to the rear and slowly push the



bolt forward and check to see if the cocking piece strikes the receiver. If it does, it could be a bent firing pin or the wrong cocking piece but generally it indicates a worn receiver, so stay well clear.

I must say I have never come across a fractured receiver but that is not to say they are not out there. When restoring the receiver every component should be removed and wash in solvent, this removes the oil and highlights all the debris and grim generated over the years. Once you have removed all the grim you can check for cracks and fractures but I cannot highlight any particular area to check as I have never seen one fail. A good indication of the rifles good quality.

The receiver is manufactured from steel block and machined to drawing, the only item not integral to the receiver is the charger bridge which is riveted in place and I have never seen one come loose. As mentioned previously the receiver is a complicated design by modern standards, complicated to machine and with many machining operations.

Another area of wear is the bolt head rib, these will wear to a point where they wont secure the bolt head, occasionally replacing the bolt head cures the problem but more often than not it is the rib and therefore the receiver is beyond repair. With all the component parts of the receiver fitted, one should inspect the safety catch, ejector, sear, sear spring, magazine catch and the spring retaining bolt head. Although these items rarely fail, they do require cleaning as they can get heavily engrossed with debris which will impinge on their efficient operation. The screw retaining the spring retaining bolt head regularly comes loose so this should be checked for security and any debris removed from behind the spring.

Overall finish should be checked but occasionally the user may note a green paint like substance applied underneath the receiver, this is normal and was a form of rust protector used in those times. As it is has historical relevance the user may wish to retain it but also be cautious because it almost certainly will be lead based . The receiver is usually heavily marked with inspectors stamps, manufacturer, model and date of manufacture. Ideally, serial numbers should match but it is not essential as Armourers regularly head spaced and renumbered components.

Barrel

The SMLE barrel is 24½” long, has a 1 in 10 twist and is relatively light. Unlike the later No4 model the rear sight is mid barrel and the rear sight block is silver soldered into place. As mentioned earlier the SMLE is a rather complicated design and the barrel setup is no exception, although it doesn't look so from the image above. Being a light barrel, barrel oscillations must be consistent to maintain accuracy. To obtain this consistency the barrel has a barrel band, which is spring loaded and although a separate component another spring loaded plunger near the muzzle as shown in the image to the left.

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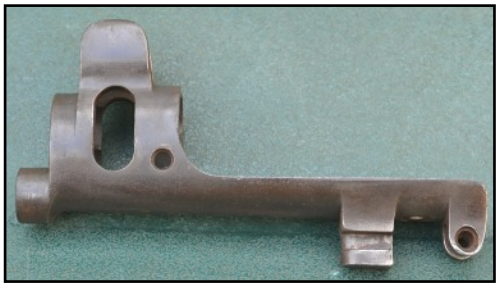
The foresight block is keyed and pinned and I have never seen one loose and again that is not to say they are not about. The foresight blade is a dovetail and interference fit and I have come across loose ones, however more commonly I have seen No4 blades fitted which having a slightly different sized dovetail, which in turn damages the foresight block.



Unlike the later No4 the barrel is numbered to the receiver as can be seen above and helps indicate the rifles history. Like all rifles rifling must be sharp and bright throughout its entire length but especially around the lead or the commencement of rifle (C of R).This rifle had an excellent bore and was one reason for my choice as a donor rifle. The Armourer was provided with a series of barrel gauges that measured bore wear and these can still be found today and indicates the high level of quality that these rifles were built too. As a combat rifle the SMLE is unique in that its entire barrel is enclosed by the stock, handguards and the nose cap. The nose cap is important to the correct function of the barrel and serves multiple functions, which include foresight protector, piling hook, bayonet boss and muzzle protector. Therefore you rarely find impact damage to the crown or muzzle. Due to the nose caps need to support the bayonet it is substantially constructed and you rarely find any damage other than rust or the egress of debris.

The only downside of the nose cap, is that it must be removed to adjust the foresight blade. This was a wartime saving as earlier SMLE's had adjustable rearsight which the MkIII* did not. Removing the nose cap affects the barrels oscillations, plus there is

plenty of opportunity to loose the screws. Once the blade had been adjusted and to ensure the consistent oscillations the nose cap would have to be re-assembled, therefore it was not the best of ideas. As an Armourer I made a little tool which meant I can adjust the foresight blade without removing the nose cap.

Bolt

When discussing the SMLE bolt mechanism one must remember its conception was at the end of the 1800's in the Long Lee and from lessons learnt in the Boar War. That means this MkIII* bolt design was already some twenty five years old by the end of the first world war. The Mauser 1896 was probably the best rifle of the Boar war and cost us "Brits" dearly but whilst this bolt mechanism lacks the strength and accuracy of the Mauser, its rate of fire coupled with a ten round magazine made the SMLE and the later No4 the best combat rifles of their time. The key to the bolts high rate of fire is it's single locking lug, which engages in the reciprocal grove in the receiver. Lifting the bolt slightly provides a camming action which in turn generates primary extraction. The rib on the opposite side of the bolt provides a locking action and safety function should the locking lug fail, plus it provides a balanced transfer of recoil energy into the receiver.

The bolt head is another unique feature of the SMLE. Removable to permit the stripping of the firing pin, the bolt head is provided in three sizes and the head is numbered 1,2 &3 respectively. The purpose of which was to allow the Armourer to correct the headspace as the rifle started to wear. Unlike the Mauser which required a completely new bolt body, the SMLE simply needed a new bolt head, which was a far more cost effective solution. The bolt head contains the extractor which although very reliable, does fail on the odd occasion and the bolt head overturn should not exceed 15°. The bolt head engages in a rib in the receiver body and therefore is not interchangeable with the No4.

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At the rear of the bolt is the cocking piece which although possible, is not interchangeable and therefore this is a common fault where annoying amateurs fit the wrong part. If a No4 cocking piece is fitted, also check the firing pin as you can bet this will also be a No4 part - buyers beware. Correct operation of the cocking piece is essential to the rifles good and safe function, it should not be loose on the firing pin, the underneath should not touch the receiver, the safety must engage in all positions, including the safety bent and there should be a first and second pull on its release.

Lastly the firing pin, they rarely go wrong but you should check spring pressure and firing pin protrusion as a matter of course. If something is wrong its usually down to the tampering's of an amateur and the fitting of wrong parts or incorrect assembly. The only genuine faults I have seen are broken or bent firing pin, hydrostatic lock due to over oiling and rust/debris. The image above shows the correct firing pin and an early model cocking piece which is not normally associated with a MkIII*.

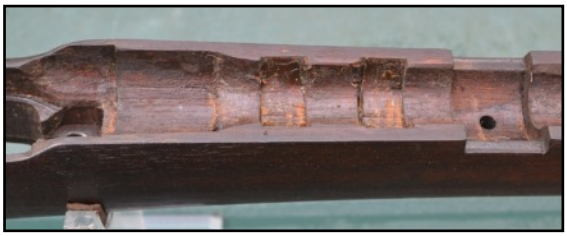
Magazine

A rifle is a mechanism that consists of various sub assemblies that when operated together provide an effective machine and the magazine is therefore the weakest strategic link. The magazine is “the engine that feeds the machine” and should be treated with the utmost respect, but sadly it is often not. Magazines are chucked in bags, on the ground, impregnated with debris, grit and their feed lips distorted and are therefore one of the most common problems on a SMLE. SMLE magazines are not interchangeable with early or later models of Lee Enfield. Although detachable they are designed to be feed by a charger and it is my opinion that they should charged by clip or singularly whenever possible. If a magazine feeds reliably, leave it alone and only strip it for occasion cleaning and inspection. The tension spring at the rear of the magazine does fail, lips are damage beyond repair and sometimes the area around the lips does fracture.

This magazine shown in the image has just been cleaned in solvent, checked for damage and awaiting for re-blueing and re-assembly. Feed angles will be checked and once assembled to the rifle checked for reliable feed.

Stock

Unlike many rifles of the period the SMLE stock consisted of four separate components, butt, stock, front and rear handguards and therefore as stock designs go the SMLE is more complicated and the upper handguards in particular are rather prone to fractures. As later SMLE variants came into service, so did modifications to improve this shortcoming but it is still an area that should be regularly checked. British SMLE stocks were always walnut and were very well made but you sometimes find beech which heralded



from WWII era rifles and coachwood on Australian Lithgow rifles. On this rifle there was a couple of small fractures on both the rear and front handguard that were easily repaired but the butt had taken a bit of a battering as can be seen in the bottom left image. The original repair is a typical armourers field repair of the time, where wood dust and glue mixed together to form a paste, allowed to harden and then finished.

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I followed up on this repair by removing the original and fitting two walnut patches and refinishing. Another of area of common damage and this rifle was no exception is the butt plate when used for parade ground drill. The butt is damaged but worse so is the screw heads as they are the highest point and therefore get crushed and can be very difficult to remove.

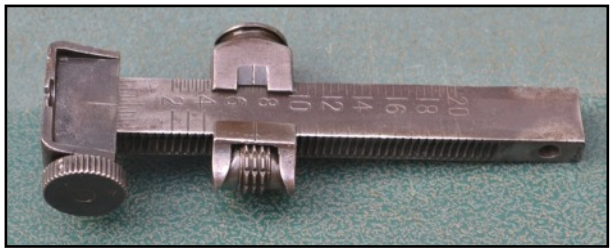
A common cause of poor accuracy is the poor fitting of the stock, the barrel is not floating but must touch the stock at certain key points, any other contact point or movement of the action will cause inconsistency from shot to shot and therefore the loss of accuracy. To avoid this I bedded the receiver around the chamber and the recoil blocks, thereby ensuring a perfect metal to wood finish.

Although not terribly exciting I have included the image of the butt bolt as the SMLE's is unique and is not interchangeable with the No4. The square section at the front of thread is designed to be locked in place by the locking plate located in the stock, thus stopping the butt from becoming loose. Therefore to remove the butt , you must first remove the stock, failure to do so results in damage to the bolt and the locking plate.

Trigger Mechanism & Rearsight Assembly

The trigger mechanism on the SMLE may not be the best, but it is functional, reliable and you rarely need to replacement parts, if something does go wrong it is usually down to human error. 1st and 2nd pull is set-up by stoning the two humps on the trigger and any tuning is by stoning and polishing the various bearing surfaces. However if there is a weakness it is due to the trigger being part of the trigger guard and not the receiver, therefore poor fitting of the trigger guard can impact on the operation of the trigger mechanism.

The image shown of the rearsight is an early model and not one normally associated with a MKIII*. This sight has a windage adjustment rearsight which on this particular rifle is seized. I have learnt from experience to avoid trying to repair seized rearsight's, as you usually caused more damage and spares are non existent. The slide should be regularly serviced as they tend to stiffen up with debris or congealed oil. In general it is a good rearsight that complements the rifle well, however as a barrel mounted rearsight the older shooter with poor eyesight will struggle to focus, which leads me to the next subject and the primary reason for this project.



Scope bracket

As Enfield's go, I tend to shoot the P14 or the No4, this is because they have receiver mounted rearsight's which suits my ailing eyesight and as a result I have not owned a SMLE for a number of years. This mount gave me the option to change that situation. Lee Enfield's are not the easiest rifles to mount a scope because of their split receiver design and over the years there has been a plethora of designs that have met with various degrees of success. Mounts for SMLE's tend to fall into three categories, genuine military mounts, which are rare and expensive, modern or semi-modern commercial mounts such as B-Square, S&K and what I call "odds & sods". This mount in my opinion falls into the "odds & sods" category because for all my searching of the Internet I have not found anything similar, which makes me think this mount may have been made by Parker Hale but modified by a local gunsmith as part of a post war sporter conversion rather than as a mass production run by Parker Hale. Another reason for this line of thought is the three mounting holes are not parallel which indicates it was not built on a machine.

Whatever the mounts history, it matches the SMLE well and I wanted to fit it to a "common" SMLE because I needed to drill and tap the receiver. Fitting it to a more rare SMLE would only devalue it, which was something I didn't want to do. The mount does not sit perfectly centre line with the bore, in fact it sits slight left of centre as can be seen in the image on the following page. Therefore fitting the scope was relatively easy as the primary concern was to ensure the scope was parallel with the bore.

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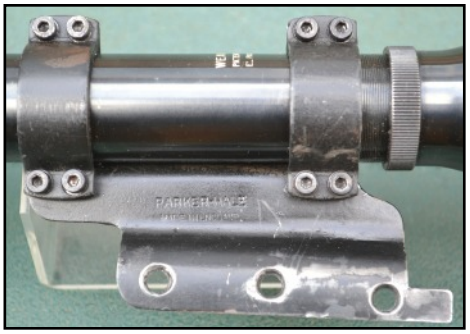
To keep the whole package as period as possible, I initially fitted a 1960's Hensoldt Diapi-D which had a 22mm steel tube and excellent optics, however the small parallel tube made for difficult cheek weld and as I had to use 25-22mm inserts which was very difficult to setup. As a result I fitted a 2¼ J.C.Higgins Scope, also circa 1960 and manufactured by Weaver. I purchased the scope



from the US via EBay, it was in immaculate condition and I felt complimented the rifle well. The scope has a steel 1" tube with a fine wire reticule and although the magnification is only 2¼ and therefore a bit on the weak side it is perfectly adequate as planned engagement distances will only be out to 300yrds or so. Another advantage was the ocular bell housing as it permitted a better cheek weld, plus the 1" tube just dropped straight into the mount without any modification.

Range Test

My first range test was set at 100yrds, shooting supported from the bench and using PPU .303 to roughly zero the rifle. Once roughly zeroed I switch to reloads which consisting of Hornady brass, Hornady .303 174gr FMJ and 40gr of N140. Although the rifle zeroed fine, groups where not that great as I would have liked and varied between 2" and 4", good enough for an average infanteer but not for me and a scoped rifle Why this is, I was unsure, the barrel is brand new, the action was bedded and the scope bracket is secure with no movement, which left me with two potential options. The barrel was touching the woodwork somewhere or maybe a problem with the scope itself. Stripping the rifle down I tuned the trigger, relieved the barrel channel, checked, refitted the woodwork and headed of to the range again.

My second visit to the range was more successful, using the same setup as before, the rifle consistently gave 2" groups or less which was fine. Feed and extraction was flawless and the rifle a pleasure to shoot. The scope and its mount remained secure throughout the range test and at the same time sorts out my declining eyesight and assists in maximising the rifles accuracy.

Summary

I have shot so many Enfield's over the years be they mine, customer builds, accuracy tests or repairs and in my opinion as military rifles go, they are hard to beat. Mauser may have a stronger and more accurate action, their rimless 7.92mm cartridge may be better from a feed point of view but the rapid fire of an Enfield bolt supported by a ten round magazine is a battlefield winner. From a civilian aspect it is simply a pleasure to operate, shoot and the fairly mild recoil of the .303 cartridge will allow you to sit there all day on a warm sunny range and shoot all day long. The SMLE was produced at a time when mass production was only just arriving on the scene and quality still mattered.

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The No4 was easier and cheaper to manufacture but the SMLE soldiered on through two world wars and countless smaller fracas, so one could say it was the best of the Lee Enfield models.

I for one think you cant beat the warm wood with lovely grain, polished brass, all matched to a high quality action and barrel. If you get a SMLE have it fully restored and look after it, it will last you a life time and will increase in value. You will not have to worry if it will shoot straight or replace the barrel every 1000 rounds.

My only criticism of the SMLE is that from a manufacturers point of view it is overly complicated for a military rifle, however that matter was resolved with the introduction of the No4 in 1939. With respect to the mount, its a good mount with the upright section sitting flush with the receiver inner wall. This permits rounds to be handloaded and avoids any complication with ejection process. Many mounts that I see for the SMLE can be quite complicated affairs, however this mount is both simple, effective and if I may say, quite handsome from a mechanical standpoint.

This rifle was manufactured in 1918, in two years time this SMLE will be 100 years old - I only wish that I would be in such good condition and function with such effectiveness if I make that grand old age.

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