

CHAPTER 23

CLEANING

The controversy over how often a .22 target rifle should be cleaned has raged for many a long year. If you were to carry out a survey amongst your club members, asking a question like “How often do you clean your rifle?” you’ll probably get answers like “every so often”, “never” or “every time I shoot”.

Everybody seems to have a different idea of how often it should be done and, what’s more, they also have different ideas about *how* it should be done.

In the old days, before the advent of the modern smokeless non-corrosive ammunition which is used these days, it was essential to clean out gun barrels, otherwise they became so clogged with debris from repeated firing that they wouldn’t fire at all.

The main original reason for regular cleaning of modern rifle barrels was to avoid corrosion, caused mostly by the fact that primer compounds contained potassium chlorate, which produces potassium chloride when fired. This, as you may well know, is very similar in nature to sodium chloride, which you sprinkle all over your fish and chips, along with acetic acid (vinegar).

One important and damaging property of potassium chloride is that it is hygroscopic, i.e. it attracts moisture. Therefore, if it’s left in a rifle barrel in a humid atmosphere, it will very quickly attract water to the steel (and you can imagine what salty water does to steel!)

In those days of corrosive primers, the best cleaning agent was actually water, because potassium chloride - like ordinary table salt - is soluble in water. But riflemen had an aversion to cleaning their barrels in just plain water, and the manufacturers very soon produced cleaning oils which were a combination of oil and water. (In case you thought oil and water don't mix, let me assure you that some do).

Because the water was notorious for finding its way into cracks and crevices in firearms, and was then extremely difficult to remove, the emulsion of oil and water worked very well - the water dissolved the salt and the oil stuck to the metal to protect it.

If you were wondering about the relevance of this chemistry lesson, then look at the back of a can of *Youngs 303* - one the most well-known cleaning oils used by smallbore target rifle shooters. There you’ll find a formula for ‘Aquaoil’, which is three parts water mixed with one part *Youngs 303*. Now you know why they recommend it be mixed with water.

Nowadays all smallbore target ammunition is non-corrosive, so there's much less of a problem, which is why one particularly well-known top shot in this country claimed not to have cleaned his rifle for twenty years!

So if you don't *have* to do it, why do it at all? Well, some people can't bear the thought of using a dirty tool and, as an attitude of mind that's difficult to argue with. It shows a care and love of the rifle which brings its own rewards; psychologically they will feel that it shoots better for them and, of course, it *may* actually do that (or not - as the case may be).

Other people are of the opinion that while the rifle's shooting all right, leave it alone, don't disturb anything; that also has psychological benefits to some people. Then there's the problem of deciding what is clean and what isn't. Some shooters will scrub vigorously, others will just run a patch down their barrel, but who is right?

The shooter who cleans his rifle every time he shoots may only pass a dry patch down the barrel to remove the powder residue; in his mind his barrel is then clean.

Somebody else will scrub the barrel with brushes and solvents before accepting that the barrel is clean. There is, of course, one concrete and definite answer to all these questions, which will tell you exactly how much and how often you need to clean your rifle, and that nugget of valuable information will be imparted later, but first of all let's delve into the alternatives available.

You have to understand a little bit about what you're doing and what you're trying to achieve before you can set about cleaning a rifle.

Let's take the barrel first. It's difficult to see very far down the inside of a .22 rifle barrel, but if you hold it up to the light it will look very dark and dingy, and (if you've just finished shooting) will have a residue lying along its length. One sweep of a dry patch down its length will leave most barrels looking like new, but does that mean the barrel is clean?

When your barrel is rifled, it's done with very hard tools which leave tooling marks on the surface of the steel in the rifling. These marks are real traps for any muck and rubbish which you happen to throw down the barrel (with due respect to the ammunition manufacturers).

A quick sweep with a brush or a dry patch will remove all the loose debris, but is that all that's necessary? In case anybody is beginning to wonder why there are more questions than answers, it's because it's intended to get you, the reader, to think about what it is you're doing.

It would be an unusual rifle barrel that didn't collect a small amount of lead somewhere: you can't send lead bullets - down a barrel at high speed, high pressure and high temperature without expecting some sort of lead residue to be left behind. Of course, it may then be removed by the next bullet to come along, and that in turn may deposit its own trail of lead, and so it goes on.

If we could rely on this procedure of deposit and removal always being consistent and equal, then we would have no problems, and things could be left as they are, but as with most things in life, it's never that simple. Most modern .22 bullets are very well lubricated and that does keep the leading problem to an absolute minimum, but if a rifle has a serious problem with its barrel leading up, this can show up on the target.

Suppose, for example, that there's a particularly bad tooling mark in the rifling which is bad enough to take lead off a bullet; that lead, instead of being taken out by the next bullet, could actually be forced further into this crevice, and take more lead off the next one.

Eventually, after this process has been repeated a few times, the lead build-up finally gets ripped out by a bullet because it's grown too big. This all results in shots gradually climbing up out of the bull and then suddenly dropping back down again, or a sudden apparently 'wild' shot, with the next few also being out, until they settle down again into the bull two or three rounds later.

If you suspect that you're getting any of the above symptoms, it would be worth you giving your barrel a thorough scrub with a lead-removing solvent to see if that improves the situation (or makes it worse). If you haven't already got one, then get yourself a plastic-coated .22 cleaning rod - *Parker Hale* make one that is suitable - with a revolving handle so that the rod turns round to follow the rifling without you having to twist your hand.

If you intend to do any serious scrubbing of your barrel, that means a phosphor bronze brush. Don't be put off by its wiry appearance - the bronze wire is much softer than the steel of your barrel and will do it no harm at all.

A suitable lead solvent might be *Hoppes No.9* or *Parker-Hale 009* - both are designed to remove metallic fouling from barrels - they both attack non-ferrous metals and won't harm the steel of your rifle.

Do use a cleaning rod guide if you can get one to fit your rifle. This will be a tube made of plastic or aluminium, with a .22 hole down the middle and the outside will be shaped like your bolt so that it can replace the bolt in your rifle. It makes presenting cleaning implements to your barrel much easier, and tends to protect the trigger mechanism from flying droplets of oil and dirt.

Never clean a rifle barrel from the muzzle end - that is the most delicate and important part of your barrel and any damage in that area caused by the careless use of a cleaning rod could affect accuracy. If you intend to do a thorough cleaning job, it would certainly be a good idea to remove the stock, and take off the trigger if possible; that makes life so much easier.

With a *BSA* you'll need to remove the action; with an *Anschutz* you should remove the bolt. You may even like to remove the little shiny floor plate, which is held in place by the ejector kicker and a little spring clip under the receiver - that saves solvent finding its way underneath where you can't get at it.

Make sure your cleaning rod is straight, as a bent one will be much harder to use and control, and it will rub all the way up the barrel, leaving bits of plastic behind. Dip the phosphor bronze brush in the solvent and give it a good steady push up the barrel until it completely clears the end of the muzzle, then pull it all the way back and withdraw from the chamber. (It's not a good idea to do this on the kitchen table as metal solvents tend to have fairly pungent chemicals in them and will certainly make a mess of linen tablecloths.)

When the brush clears the end of the muzzle it will tend to spray oil in all directions and whereas *you* might quite like the smell (in fact perhaps that's why some people clean their rifles so often), other people don't.

Several passes of the brush up and down the barrel will remove most of the lead contamination, but that will vary from barrel to barrel. It's quite acceptable to leave the solvents in the barrel, because, as mentioned earlier, they don't attack the steel.

So, over a period of time you could vary the speed and timing of your brushing to see what produces the best results; you could, for example, leave the solvent in the barrel for an hour or so after the first brush-up-and-back, to see if it comes up cleaner.

It's difficult to get any speed going in view of the length of the barrel and the spindly nature of the cleaning rod, so be patient: 'slow and careful' is the name of the game. After you're happy with your brushwork (and it would be a good idea to make a note of exactly what you did so you can remember for the next time) you need to remove all that wet gooey muck from your barrel.

There are two ways of doing this:

Firstly there is the time-honoured method of *Forbytoo* and a jag. Wrap the patch of *Forbytoo* around the jag (this is where you'll find the rod guide useful, because it's at the back of the action and convenient to get to) then push the patch up and down the barrel. However, this time don't allow the patched jag to come out of the muzzle, because *Forbytoo* has a habit of unravelling when you least expect it.

Keep passing more and more clean patches up the barrel until they come out clean. (N.B. if you're using an aluminium rod guide, the patches will never come out completely clean).



A typical cleaning kit

The alternative to patches is the VFG system of cleaning felts. This requires a small adaptor as shown in the photo and the small .22 diameter round felts with a hole in the middle.

The first felt screws onto the adaptor, and a second is pushed on behind it. The felt on the end sweeps all the main debris out of the barrel as you push it through and out the muzzle end. As you pull it back, the dirty felt then falls off and the one which is screwed on can be pushed and pulled up and down the barrel, absorbing the oil as it goes. These are much quicker and easier to use and are readily available from good target shooting shops.

The exact formula for how often your rifle should be cleaned is as follows: *clean your rifle as often as it needs cleaning* - no more and no less. Before any of you shrug your shoulders and turn away in disappointment, the secret is in deciding how often it needs cleaning; the critical factor here is the *effect* that cleaning has on your rifle's accuracy.

There is obviously no easy way of measuring the accuracy of your barrel other than shooting it and keeping a careful note of how it performs at various stages in the cleaning process, so that's what you're going to have to do in order to define the exact process by which you maintain maximum accuracy.

If you ring up a barrel manufacturer and tell him your gun shoots better if it's left dirty, and it shoots worse every time you clean it, he'll probably tell you that you need a new barrel.

If you ring another barrel manufacturer, and tell him the opposite, i.e. it shoots better after you've cleaned it, he'll probably tell you that you need a new barrel as well.

If you then get a new barrel, you could find that it shoots better when it's clean, or you may not! (Unfortunately this is not an exact science and you have to spend time working out your own formula.)

There is one argument that says the newer the barrel is, the more it will require cleaning because it will have manufacturing marks left on the inside which attract dirt. Then, as they get smoothed down and polished with use, they are less likely to retain muck and rubbish from firing.

Working out a cleaning formula must come as a result of you analysing your shooting, and to do that you must be critical of your group size.

Let's start from the beginning. Clean the barrel thoroughly so that you're sure you've removed all the lead and residue from previous firings.

Now take your rifle to the range and shoot it at one diagram (preferably at 100 yards), keeping a mental note of where each shot goes right from the beginning. If your rifle shoots right in the middle of your group with the first few shots - fine; if not, then make a note of how many shots are necessary before it settles down to its normal group size.

Some rifles may take up to 20 shots or more before they settle down, others may only take one or two. What is important is to learn exactly how your rifle reacts.

After you're confident that your rifle's shooting to its group size, get up and clean it again, only this time just pass some patches or felts down the barrel with a drop of cleaning oil, like Hoppes No.9, or Youngs 303; dry it out with clean patches and then get down and see how it shoots on another diagram.

Keep a note again of how it performs and after you're sure that it's shooting its normal group size, get up and clean it again, only this time just pass one dry patch or felt down the barrel to sweep out the residue; then get down and shoot it again.

At the end of this third exercise you should be getting some idea of the degree to which the various cleaning processes affect your rifle.

The next test is to extend the number of shots between each cleaning stage and see what effect this has.

Over a period of time you should be able to build up a pattern which will tell you exactly how often and how much you should be cleaning your barrel.

You might find, for example, that if your rifle takes a long time to settle down you may not want to clean it very often. On the other hand, if you detect an enlargement of your group which magically shrinks when you clean the barrel, then you may want to clean it fairly regularly.

By now you should be getting a clue as to why there are so many differing ideas about when and how often to clean a barrel, but you should also now be able to work out your own formula instead of blindly following what your resident club expert tells you to do. Just choose the system that produces the best grouping results in your rifle.

Having sorted out barrels, there is actually more to cleaning a rifle than just keeping the barrel bright and shiny. Unfortunately the little .22 round is one of the dirtiest to fire, but don't be alarmed, 'dirt' isn't really the right word.

Parts of the rifle may get 'mucky', but that's because .22 bullets are normally covered in lubricant, some of which gets scraped off each time you place a round in the chamber.

It may look awful, but at least it *is* a lubricant; unfortunately it gets mixed with the burnt powder residue which is not only left inside the barrel, but also falls out the back as you extract your empty case after firing. This residue can feel hard and gritty after a time and, mixed with the lubricant, could form a sort of mildly abrasive grinding paste, particularly if you shoot indoors in a dusty range.

Having now created a very black picture which made you all rush out for your cleaning equipment, let me put your mind at rest: your rifle is built to withstand 8 tons per square inch of pressure, and the front face of the bolt (where most of the muck collects) is hardened (and it doesn't rub against anything else anyway), so it would take more than several years' accumulation of gunge before there were any serious implications in terms of wearing out your rifle. Not even Martini actions would be affected to any great extent.

What is more important is the possible effect on your headspace - that area between the back of the barrel and the face of the bolt which holds the rim of the cartridge.

Any dirt in that area could soften the blow of the firing pin and affect the speed of ignition, which could result in a variation in velocity.

It's always worth keeping the front face of the bolt clean, as well as the rear end of the barrel (particularly the extractor slots, which seem to be neat little receptacles for bullet lubricant and powder residue).

The extractors themselves carry on working satisfactorily for ages until suddenly they become so gunged up with muck that they stop altogether.

When you do clean them, be careful how you remove them as they're worked by little coil springs and plungers, which delight in flying across a room and disappearing into the carpet.

Martini action owners can drop the action out of the rifle to get at the end of the barrel and the inside of the trigger, which is an area that must be kept scrupulously clean. Some *BSA* triggers have been known to stop working properly just from an accumulation of gunge.

The new *Anschutz* triggers (ones produced after 1976) are very exposed to the elements, so the next time you have the barrel and action out of the woodwork, have a look at the trigger.

There are a lot of delicate levers and springs inside which don't like dirt, so a very gentle but thorough clean would not go amiss. You'll find an aerosol degreasing fluid very useful here.



Clean that trigger regularly

Don't over-oil the trigger when you've finished cleaning it, as oil just attracts more dust and dirt. If necessary you could put the slightest smear of molybdenum disulphide grease on the sear and the merest hint of oil (about the size of a pin head) on the pivot pins, but that's all.

If you feel confident about taking a Martini action apart to clean it, then do so, but be warned, the extractor spring is very strong and needs to be compressed during disassembly. (Gun shops love being handed a bag of bits and asked to re-assemble them - they charge a fortune, so you've been warned!)

Disassembling a bolt from an *Anschutz* or *Walther* is relatively straightforward and the more times you do it, the easier it gets. Just remember as you take off each part, lay it down the right way round, with each piece in order, so that when you come to re-assemble the bolt you pick all the pieces up the right way round in reverse order.

If you have a rifle with a fully floating barrel - that means all *Anschutz* rifles since 1954, *Walthers*, and *BSAs* since the Mark III- then you'll need to keep the area under the barrel very clean; any accumulation of debris lodged between the barrel and the forend woodwork could seriously affect barrel vibrations and hence the accuracy.

You should be able to pass a piece of paper down between the barrel and the woodwork - minimum thickness should be that of a target.

One area very often neglected in rifle cleaning is the sights. Some people religiously clean their barrel every time they shoot, but ignore the fact that their sights are full of dust, hairs and all sorts of rubbish. A hair lodged across your rearsight aperture will interfere with your sight picture, and consequently your scores, much more than a dirty barrel.

Camera shops are good places to find cleaning equipment for your sights - they sell all sorts of little brushes with rubber bulbs on them for puffing air through the bristles. They also sell aerosol cans of air, but these are horrendously expensive, although they can be useful in an emergency.

Anything used for cleaning a delicate piece of equipment like a camera is going to be all right on your sights.

Be warned, however, about attacking your sights with a cocktail stick and a bit of rag or cotton wool. The last two have the habit of leaving bits of thread behind (with the possible same disastrous effect as a hair) and the last thing you want is a splinter sticking out of your rearsight.

If you have an adjustable iris rearsight and colour filter set then these are very delicate precision instruments and, as such, need specialist treatment when cleaned.

They *can* be taken apart, but only with extreme care and in a very clean environment. Some of them have springs, ratchets and filters no more than 5.00mm across so if you don't feel confident about tackling a complete dismantling and reassembling exercise, just content yourself with a quick blow out.

Don't forget the foresight, which presents a wonderful little hideyhole for the odd passing spider and if you have an adjustable iris foresight, be careful how you clean it - the leaves in the iris are very easy to displace.

If you're in the habit of liberally spraying *WD40* or an aerosol oil all over your barrel, take the foresight off first, or at least cover it up. This is particularly important if you use perspex foresight elements, or an adjustable foresight with a perspex insert, as the oil will leave marks on the plastic. If this does happen, they *can* be removed with a cocktail stick and tissue paper but, again, extreme care is required.

The woodwork on most target rifles is varnished and so requires very little maintenance. You can wipe it over occasionally with a cloth, but don't use a silicone cloth, as this will tend to make it slippery.

To summarize, then, clean your rifle barrel according to how it shoots and give the rest of the rifle a thorough clean, say twice a year, keeping your eye on your sights for stray foreign bodies, particularly if you come back from a windy, dusty, wet or mucky open shoot.

Wipe the outside of the barrel and the receiver regularly with an oily cloth, and those of you who insist on carrying your rifle at its point of balance (i.e. with your thumb wrapped over the top of the receiver) please check for rust spots where you leave your thumbprint. You may not think your hands are sweaty, but you'll be amazed at the damage you're doing to the outside of your barrel by not wiping it down after handling.