

Some Notes on Reloading

Reloading can be cheaper than buying factory ammo, but reloading kit is an initial expense which will only pay for itself after a few years. It is also highly likely that experimenting with loads will lead to a more accurate round for your rifle, but this can only be done from a knowledge base and with experience.

The purpose of these notes is to give members some understanding of basic reloading techniques and the equipment required.

They also contain some cautionary words as the reloading process can seriously damage your health if done negligently or carelessly.

What equipment do you need?

The following lists the equipment needed to reload. This is the minimum and as you gain experience you may want to acquire other optional tools. The basic rule is to buy the best quality tools that you can afford. Quality tools will be reliable and last a long time (and so be cheaper in the long run). A number of manufacturers now offer starter kits.

A good Reloading Manual

Most powder or ammunition companies produce a reloading manual. There is also much data available online from Official Sites. Be very wary of copying loads on shooting forums until you have gained some experience and always check "wildcat" loads against the Manual data and do not use if they are too far afield.

Brass cases

This can be picked from the range, but there are risks associated with this. Its history is unknown so it could be on its last legs. It is far better to buy new brass from a manufacturer. That way you start from a known position.

A case cleaner

New brass can probably be used out of the box, but when being re-used it needs to be cleaned using a tumbler and media or an ultrasonic cleaner.

Case neck brush

A wire brush used to clean the inside of the case neck.

Dial indicating or Digital Calliper

These provide a means of measuring the length of brass cases and the overall length of the cartridge.

A case length trimmer

Repeated firing will increase the length of the case and it will eventually need to be trimmed back to the 'trim to' length defined in the reloading manual. There are many options on the market from

sophisticated desk top systems to hand held length gauges and trimmers. Even new brass can benefit from checking the length and trimming for consistency.

De Burring tool

A hand tool used to remove the burr from the case mouth after trimming. It is also worth de-burring new cases before first use.

A primer pocket cleaner

A hand tool used to remove the carbon from the primer pocket of a used case ready to take the next primer.

A Flash Hole de-burring tool

Not absolutely necessary but a useful tool. The flash holes in cases are punched and left a bit ragged. Reaming out will create a smoother and more regular surface for ignition.

A case primer tool

These can be sophisticated automated machines, a priming tool attached to your reloading press or a simple hand held tool. Either way it will need to be fitted with the correct shell holder for the calibre of the case being primed.

A reloading press and a die set

This will be used to de-prime your used brass prior to cleaning, re-size it ready for reloading and seating the bullet on a loaded case.

If you buy a 3 die set you will have a full length re-sizer, a neck sizer and a bullet seating die. Cases must be very lightly lubricated to prevent them seizing in the re-sizing dies.

When a case is fired it will form to the chamber of the rifle it is in and then spring back slightly. If it is your intention to use the reloaded case in the same rifle, then neck-sizing will probably suffice as the rest of the case will be a snug fit in your chamber. If it is to be used in a different rifle (of the same calibre obviously) then it will require full length re-sizing. Dies must be fitted into the press using the manufacturer's instructions.

A set of accurate powder scales

Scales can be either a balance beam or electronic and must be configured in accordance with the manufacturer's instructions and must be checked periodically with the check weight supplied.

A powder measure

Here there are a multitude of choices. Powder can either be metered by volume or by weight. Either way the powder measure must be used in conjunction with a set of scales. Fill the measure with powder of the correct type and adjust the graduated scale. Set the scales to the required weight.

Throw from the measure and weigh the result. Adjust the measure gradually so that it throws the desired weight and repeat this process every 10 or so rounds to ensure that it has not moved.

A powder trickler is an option that many prefer to use when throwing loads with a powder measure. This necessitates throwing the powder charge on to the scale at slightly less than the required weight and then topping up from the trickler which has already been loaded with the same powder.

An electronic measure meters the powder by weight and decants it directly into the pan and, if correct, the contents may be put directly into the case.

A powder funnel

This is required when pouring the powder from the scale pan into the case. One with a long drop tube will settle the powder more evenly in the case.

Reloading trays

Reloading trays will prove invaluable to organise your cases while reloading. You can work with one tray but two allows you to transfer the case from the 1st to the 2nd tray when a process has been completed.

An Overall Length (OAL) gauge

This allows you to measure the overall length of your rifle chamber. OAL measurement is used to determine the seating depth of the bullet.

The reloading process

Clean cases in tumbler using Corn Cob Media or an ultra-sonic cleaner

The cleaning process ensures that no dirt or grit enters your reloading dies or rifle chamber and makes inspecting the cases for damage easier. When removing the cases from a tumbler ensure that no media is left inside the case and that the flash hole is clear.

Inspect cases for cracks, dents etc. and reject damaged ones

This is a very important part of the process and great care must be taken to ensure that damaged cases are discarded. **They must not be reloaded.**

Clean inside that case neck

Firing leaves some residue on the inside neck of the case which, if not removed, will increase wear on the resizing die's expander button. To clean inside the neck pass the brush through the case neck 3 or 4 times and tap the case, open end down, on the bench to remove any residue that falls inside the case.

Set the correct shell holder in press, fit re-sizing die (full length or neck sizing) following manufacturer's instructions

It is important that the die is correctly adjusted to ensure that the cases are correctly reformed and the decapping rod only travels far enough to

remove the spent primer. If the rod travels too far it could impact the base of the case and be damaged.

Lightly lubricate case with die wax

The lubricant must be used sparingly. If too much lubricant is used the pressing process could cause hydraulic dents to be formed in the shoulder of the case.

Put through press to de-prime and re-size

This is where 2 reloading trays become useful. Take each case in turn and put it through the press to remove the spent primer and re-size. After removing the case from the press check that the primer has been removed and place the resized case in the 2nd tray.

Check case length using correct mandrel and case trimmer

The case length should be checked against the maximum length defined in the reloading manual and, if it exceeds this, trimmed to the trim to length measurement defined in the reloading manual.

De-burr trimmed cases inside and out

This removes any burr left after resizing. Only a couple of light turns of the de-burring tools should be needed.

Clean cases to remove lubricant

All traces of the lubricant must be removed before the case is loaded. Wiping with a clean cloth should be sufficient however they can also be put through the tumbler or ultra-sonic cleaner again if you prefer.

Clean primer pockets

The fired primer may leave some residue in the primer pocket. Inspect the primer pocket and if necessary clean it with the correct tool.

Prime cases

This is potentially the most hazardous part of the process. Take care not to drop any primers on the floor but if you do ensure that you find them all; they will explode if you tread on them! Not a good idea to use the wife's Hoover for this purpose either!

When using the priming tool wear safety glasses and ensure that the neck of the case points away from you and not at anyone else. This will prevent injury should the primer be set off when being seated.

Set up the priming machine with the correct shell holder and load with primers. Use those recommended in the manual and try not to handle them in the priming process, they are sensitive to contamination.

Load the cases with powder

Check that you have the correct powder for the required load and only have one container of powder on the loading bench at any time. Accidentally using the wrong powder could result in a dangerous load.

1. Select the desired powder from the Reloading Manual and fill the powder measure.
2. Zero the scales and then set to correct load from Reloading Manual.
3. Fill the powder trickler.
4. Throw powder loads into scales and adjust until a fraction under desired load is achieved.
5. Top off to correct weight with trickler and fill case using powder funnel.
6. Repeat steps 4 and 5 until all cases are filled and in the reloading tray.
7. Pass reloading tray under a lamp and do a visual check to ensure all cases are filled to the same level.

Once all of the cases in the tray have been charged it is important to do a visual check to see that they are all loaded to the same level. This can be accomplished with the aid of a torch if necessary. All loads should fill the case to at least 75% of the case volume. If all or some are visibly less than this then reject them and double check the powder measure and scales.

Check rifle chamber with OAL gauge and determine optimum bullet length

The OAL gauge comes with a dummy case which is entered into the rifle breach with a bullet. Using the slider, the bullet is gently moved forward until resistance is felt (this will be the bullet touching the lands). The slide is then locked in position with the lock screw. Now remove the gauge and with a calliper measure the length of the bullet from base of case to tip. This will indicate the overall length of your rifle chamber.

Refer to the manual and see what the recommended OAL for your bullet is and start there.

Cartridges usually shoot better with a uniform jump into the lands of the rifle, so consistent length is important. With some experience you can start experimenting with different lengths somewhere between 10 and 20 thou short of the lands. There will be a sweet spot somewhere in there which suits your rifle and experimenting with powder load and bullet length will find it. But do not stray too far from the Manual and only do this when you have gained some experience.

Seating the Bullet

Fit the seating die to the press in accordance with the manufacturer's instructions. It is important to note that the seating die can be adjusted to crimp the case neck when the bullet is seated. Unless the bullet you are using requires a crimp ensure that you adjust the die, as specified by the manufacture, to prevent crimping.

Assuming you have already decided on the optimum OAL for your rifle it is useful to make a dummy bullet of that length to aid future setup of the seating die.

Take a trimmed but unprimed case (without powder obviously). Back off the central screw on the seating die. Hold a bullet in the case neck with your fingers and insert it into the seating die. Work the lever and you will feel the bullet seating. Take it out and measure with your calliper. Too long! Adjust the screw down a half turn and insert the bullet again. Continue until the cartridge is at the right length and lock the adjustment screw with the locking ring. Mark this dummy with a coloured felt tip and it can now be used as a template to set up the seating die to that length in future.

Now that the seating die is set, take your tray of primed and filled cases, seat a bullet in each case and arrange them back in the tray.

Labelling

Prepare a label which notes the calibre; case make; primer used; bullet used; powder make and amount; OAL and when you have measured it on the range the M/V. Stick this to your ammo box and transfer the bullets from the tray to the ammo box.

Reloading Register

Keep a register recording all of the above data, the date and the number loaded. Do not trust formulae to memory; write it all down. This will form your reloading register which your firearms licencing authority may wish to inspect at FAC renewal time.

Some words of advice and caution

Always keep powder in its original container, do not be tempted to put it in something else even with a new label. They sometimes fall off!

Original containers should protect contents from moisture. If exposed to moisture powder will 'ball'; block measures and deliver short loads.

Powder or primer spillages should not be cleaned up using a vacuum cleaner!

Do not tumble primed or even worse loaded cases!

If using a 'trickler' to top up loads to correct level, make sure it is emptied at the same time as the main powder measure otherwise powders might get mixed.

Check everything twice to ensure you are using the right case, the right primer, the right powder in the right amount, the correct case length, the right bullet and the correct OAL.

Reloading is a very straightforward process but with many stages. Many people find that they do not want to work through the whole process every time, so keep cases available in different stages of preparation. If you decide to work in this way ensure that the status of the cases is clearly labelled. Errors causing serious damage and injury can arise from distractions and inattention. Bear this in mind.

Once you have found your magic formula of case, primer, powder load, bullet and length it should be possible to replicate this time and again; but remember things have a habit of changing. The next batch of powder you buy may not perform exactly the same as the last and you may not be able to get the same primers as you have used previously or someone gives you a gift of 1000 once fired Federal cases and you have been using Winchester before. Any change in any component must be treated with caution and the load tested and worked up again from a point 5% below your previous formula.

The worst non-availability problem is powder. There is a limit on the amount you are permitted to store at home, but if you find that your local supplier is out of stock of your favourite what do you do? Back to the manual again and see if you can find a comparable load using a powder which is in stock. There is a very useful internet download called a BURN RATE CHART which lists all makes of powder according to the rate at which it burns. Using a powder within 5 places of your favourite will probably be ok, but the whole load will need to be worked up again starting with a 5% reduced load.

If you are reloading ammunition for use on BSRC targets then you will be looking for a round that will cover 100m accurately without too much recoil. The latter is unwelcome on Running Deer particularly when shooting the Swedish or Doubles where a second shot is required. To maintain the front of body aim on the Running Deer your bullets need to be travelling about 2500 ft/sec which is quite modest. If you are reloading for Target Rifle/Match Rifle or F Class then you will be trying for maximum performance which is where the process starts working at the limits. In these circumstances it would be advisable to purchase a Ballistic Programme for your computer where you can conduct experiments with different components and loads in complete safety.

Club Reloading Courses. Ken Scott sometimes runs a short course in reloading for interested members. This will cover all of the above material, but will provide a practical demonstration and an opportunity for members to try some of the equipment. If interested please let the Secretary know.