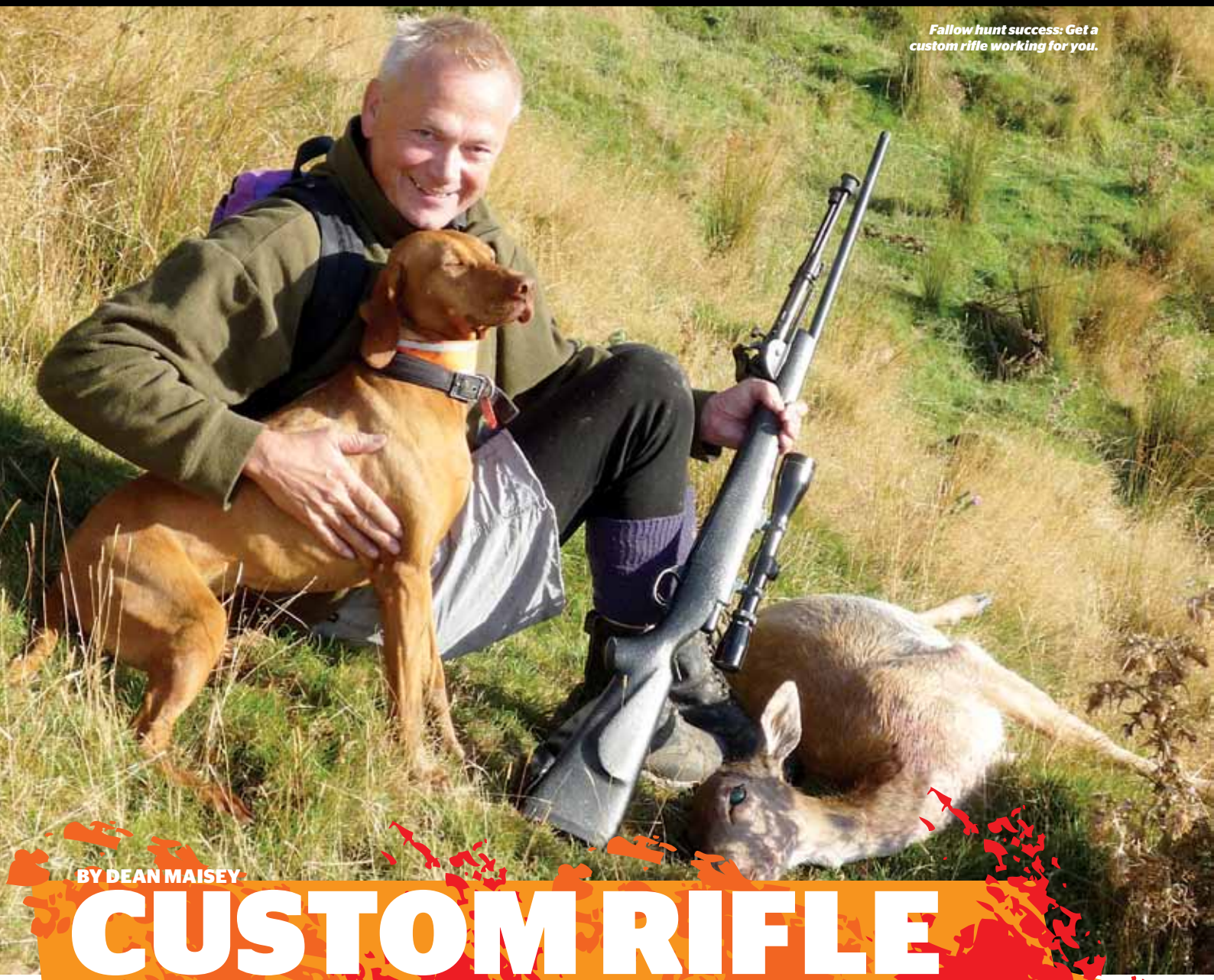


Fallow hunt success: Get a custom rifle working for you.

BY DEAN MAISEY

CUSTOM RIFLE CONSIDERATIONS

In the last issue of R&R, we looked at some of the reasons for wanting to have a custom rifle built and made some suggestions about how best to approach your gunsmith with your ideas about a custom rifle build project. In this follow-on article we will look at some of the component choices you will be faced with.

As with many things in life you get what you pay for, and a high-grade rifle requires high-grade components and workmanship. Asking your gunsmith to make a 'silk purse' rifle out of 'sows ear' components is only going to increase your chances of complications with the build process. This can be avoided by using your gunsmith's experience in knowing what to buy, before you rush out and purchase something cheap which you hope will do the job. Remember, a professional gunsmith will likely buy in more barrels, stocks, triggers and other components in one year than you will in a lifetime. If it's his reputation on the line, then he probably isn't going to recommend anything of sub-standard quality.

RIFLE ACTIONS:

As we discussed in R&R – May/June 2012, there can be a lot of problems with the machining quality and function of many factory-grade rifle actions. If you want to use a factory-grade rifle action then you will need to allow for some truing or corrective work to be performed (see R&R – Nov/Dec 2012). The other option is to start with a custom rifle action instead. Depending on whether you go 'custom' or 'trued factory' will depend on your budget and also whether any factory type rifle actions are suitable for the task. Left-handers may end up having to pay the extra for a custom action due to a limited selection of suitable factory actions set up for southpaws. Or be prepared to compromise.

Of course, bolt actions will be the overwhelming main choice but a few single shots, semi-auto, or lever-actions may well be the basis of a custom rifle project. Heavy target type actions such

as Barnard, Surgeon or Nesika may be required for very heavy-barrelled rifles whereas sporter-weight barrels can be fitted to most actions. As the choice of rifle actions will largely depend on the size of the cartridge that you want to use, it's best to consult your gunsmith first to discuss the options and costs.

BARRELS

Most of the custom rifle barrels available are usually 'button-rifled' or 'cut-rifled'. Hammer forging is the other main method of barrel manufacture, but this is usually only seen on some European and American factory rifles. The hammer forging process is ideal for mass-production but the costs of the equipment and machine set-up are expensive, which limits the supply of these barrel blanks. The world's top benchrest and other competitive rifle shooters all use match-grade button-rifled or cut-rifled barrels.

Cut rifling: as the name suggests, the rifling grooves are cut into the barrel's bore and metal is physically removed. This is done either by many passes with a single cutter (taking a lot of time), or a single pass with a full-form multi-stage broaching cutter. This is usually followed by careful lapping to smooth the barrel's bore surface after rifling to reduce the chances of excessive copper fouling, which will ruin accuracy. Cut rifling has the advantage that a customer can (sometimes) select whatever rate of rifling twist they want, or even a slightly increasing twist rate from breech to muzzle end (usually called 'gain-twist'). Cut rifling often results in bores that are very uniform from breech to muzzle when checked with a soft lead slug, which makes them a good choice if a fairly light or skinny-profiled barrel is required, along with a high level of accuracy. There are few custom cut-rifling barrel makers and with two of the big name makers – Bartlein and Krieger – the waiting list for custom barrel blanks is from 6 - 12 months or more!

Button rifling: this is achieved by pulling a carbide rifling 'button' through a bore that has been drilled, reamed and honed smooth. The rifling button (or the barrel itself) is twisted/rotated as the button and its attached rod are pulled through the bore, swaging the rifling shape into place, rather than cutting and removing metal. This swaging / forming process also tends to smooth the bore and reduces the amount of time needed to do the final hand-lapping of the bore. As a process of manufacture, button rifling is usually a much quicker method of making barrels than cut rifling with more affordable set-up costs for smaller operators. There are a lot of good manufacturers of quality button-rifled barrels and the delivery times are usually within a few weeks or months.

Fluting: this is a bit of a contentious topic and the truth is that fluting a rifle barrel will not make it more accurate or better, only lighter. There are in fact some risks with the fluting process, so you will really need to be aware of the pros and cons before you commit to it. This alone is a subject in itself, so if you want to learn more, check out the link to the fluting info page on my website. (This is found at www.gunsmith.co.nz in the 'barrel fitting' segment of the 'Gunsmithing Services' section, and the 'Custom Rifles' section.)

STOCKS

New Zealand has a well-deserved reputation for being a harsh environment for hunting rifles and gear. In recent years synthetic type stocks (plastic, fibreglass, carbon fibre etc) have really found their place in the hands of Kiwi hunters and shooters. Their main attribute is that they are not as susceptible to the effects of moisture and heat as wooden stocks, which makes them ideal for both general purpose hunting rifles as well as custom target, varmint or long range rifles. The quality of some of these synthetic stocks can vary, so consult your gunsmith first before you rush out and buy something cheap. I have found that some of these stock blank options may be cheap to buy, but take a lot of time and effort to fit (or fix) and finish, which ends up making them a very expensive stock in the end. In many cases buying a 95% finished top quality custom drop-in type synthetic stock can be a better and less expensive way to go. Many of the synthetic stocks require a painted finish, which can be subject to scratching and handling wear, flaking etc. Some stocks now – such as McMillan – offer a moulded-in colour option, where the finish/colour is a part of the outer fibreglass surface, so there is no way that it will wear or scratch off like paint is prone to do. These are great stocks to work with. McMillan is one of the better stock options which, as a dealer/ »

gunsmith, I have supplied to my customers since 1998.

Laminated stocks are another good option for those who want a wooden-type stock but with improved rigidity and stability over a regular walnut or birch/hardwood stock. Companies like Boyds, Russo and others are now producing some really fine laminated stocks at incredibly competitive prices, which can be a good option for those on a budget, provided that they make a stock model to suit your particular rifle action. Laminated stocks are often heavier than the predominantly requested light-weight fibreglass or carbon fibre type stocks, but they do require some form of sealing to prevent moisture ingress into (or between) the laminations. They basically start out as a three inch thick special plywood-type sheet (usually from Rutlands in the USA) and from that sheet, stock-blanks are cut out, machined to finished shape and inletted on CNC routers before being sanded and finished. They can be difficult to work or shape with hand-tools, so that is why most of the work is done by machine if possible. A lot of target and varmint rifles use laminated stocks due to their stability, weight and vibration-dampening abilities. It is almost impossible to checker laminates with regular hand-checkering tools, and many custom stock makers flat-out refuse to checker them. Stippling or laser-engraving of grip panels can be an option though, if you really want something there.

High-grade walnut will always have a place on custom rifles and shotguns. There have been claims for the last 30 years or more that high-grade walnut is hard or impossible to get and that supplies have dried up. This is not entirely true and may be in part due to some wood merchants wanting to keep the prices up. Good walnut blanks have always been (and will always be) available; you just have to be prepared to pay for them. Unmachined one-piece rifle blanks may run from $100 to $1000 each for the really high grade ones – and this is reasonable when you factor in the cost of actually milling a tree correctly to suit gunstocks. I've done a few walnut trees myself and know what's involved. While I do still keep a few high-grade walnut blanks on hand, the majority of my stock jobs these days are fibreglass or laminated. High-grade walnut heartwood is neat to work with hand tools or by machine and has a unique and classic smell to it. There are several types of walnut, but the main one sort after by custom stock makers is English/European walnut (Juglans Regia) and not the more common American 'black' walnut (Juglans Nigra). Californian 'Claro Walnut' was once quite popular in the US, but you don't hear much about it now.

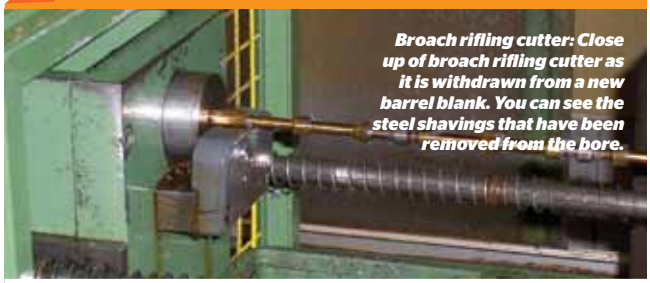
Getting a stock blank laid out with the right grain flow is important and then it must be shaped, inletted and finished to perfection. The time needed to make a one-off custom walnut stock can be anywhere from 20 to 100 hours, including checkering, and this largely depends on whether a duplicator or other machinery is used in the process. High-grade walnut will usually be oil-finished, rather that clear-epoxy finished – in order to bring out the character of the wood and to allow for easier spot re-finishing if required down the track to repair minor dings and scratches. Grip caps, butt-plates or butt-pads and ebony fore-end tips usually compliment the figure and pattern of a high-grade classic walnut rifle stock, as may be requested for an African or English type stalking rifle.

SCOPES AND MOUNTS

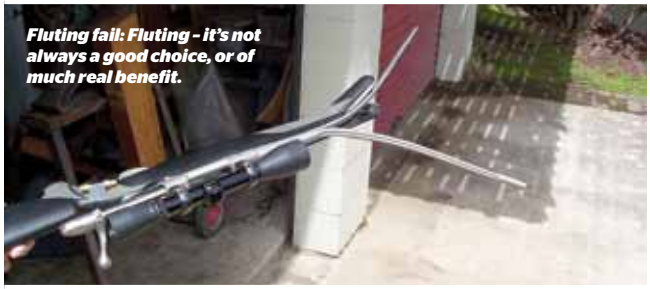
There are some really great quality scopes available to the market now, but premium scopes usually come with a premium price tag. There are also a lot of good choices in the mid-price range as well, and the quality of what you get for your money these days far outstrips what was considered 'top grade' 30 to 40 years ago. Cheap scopes will always be simply cheap scopes – with optics you do get what you pay for. Buy the best you can (or can't!) afford and support your local gunshops and importers where possible. Enough said. Consult your gunsmith about the best mounting system options for your particular rifles action to be paired with your scope of choice.

MUZZLEBRAKES AND SILENCERS

This is really a subject in itself. Silencers (or suppressors) are increasingly popular but do have a few drawbacks. They will all add a degree of weight and length to the rifle and really heavy ones may adversely affect the balance and handling of a rifle. Heat build-up in a silencer can cause heat-mirage and real (or perceived) point-of-impact shifts. They can be fine for a rifle that is not subject to a sustained or high rate of repeat



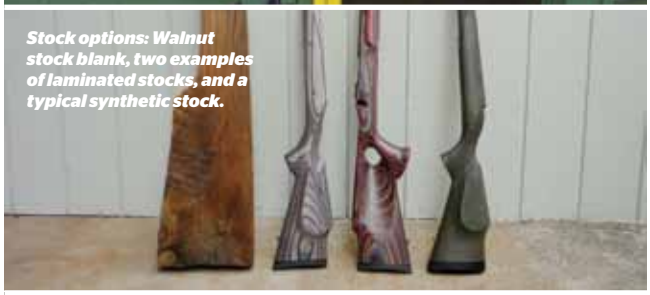
Broach rifling cutter: Close up of broach rifling cutter as it is withdrawn from a new barrel blank. You can see the steel shavings that have been removed from the bore.



Fluting fail: Fluting – it's not always a good choice, or of much real benefit.

Recoil testing: Recoil energy comparison tests between silencers and muzzlebrakes.

Rifling machine: Machine used for button and broach-cut rifling at Pedersoli.



Stock options: Walnut stock blank, two examples of laminated stocks, and a typical synthetic stock.

Target shooting: For heavier target and varmint shooting, button-rifled barrels are an excellent choice.

firing, and where the silencer has a chance to cool between groups or strings of shots.

There are huge variations in the weight and noise reduction abilities of the various rifle suppressors on the market today. Consult your gunsmith first before buying one yourself off Trade Me or wherever. Some of the claims being made for some products are misleading and/or inaccurate. Performing (reasonably) accurate sound level readings requires some very expensive equipment, which is not readily available.

Muzzlebrakes: as we discussed in R&R – Sept/Oct 2012, muzzlebrakes are commonly used to reduce the recoil of (mainly) magnum-calibre rifles back to a manageable level and to reduce muzzle-rise and loss of target view. They do this by re-directing the flow and direction of the exiting propellant gas when a rifle is fired, but the downside is that hearing protection must be worn. There is no such thing as a 'quiet muzzlebrake,' just less efficient muzzlebrakes that don't perform as effectively as others.

Silencers or suppressors do provide some recoil reduction as well as sound reduction, but the recoil reduction provided by suppressors is not as much as that from a good muzzlebrake.

Out of personal interest, I conducted some comparison tests recently to determine the reduction in recoil energy of four popular NZ-made silencers/suppressors and two of my own muzzlebrakes. Using a 7mm-08 Rem, 22" barrel and Federal 150gr factory ammo, the various suppressors reduced the recoil energy readings by 21-30% depending on model, whereas the muzzlebrakes achieved 57% reduction for my Quatromax brake and 54% reduction for my standard Tresamax side-port brake. (Note that both of the test muzzlebrakes had been actually bored to Ø0.337" for .30 cal clearance for previous tests on different rifles, not the usual Ø0.314" for 7mm cal clearance – which would have usually produced a further 1-2% improvement.)

These same muzzlebrakes were originally tested on a 7mm Rem Mag with 145g factory ammo, and the recoil reductions were 72% for Quatromax and 71% for Tresamax (both Ø7/8") which proves how muzzlebrakes typically perform more effectively on magnum calibre rifles where they are dealing with much larger gas volumes. This experiment also shows how the muzzlebrakes (when tested on the same 7mm-08 rifle) achieved more than double the effective recoil energy reduction compared to the most inefficient of the over-barrel suppressors tested.

TRIGGERS AND OTHER ACCESSORIES

Most of the factory standard triggers are only designed to operate reliably within a certain pull-weight range, often two to seven pounds, but this varies between different makes and models. When inexperienced guys try to reduce the operating pull weight of standard two-lever type triggers down too far, problems occur. There is a huge risk in working on triggers and this should not be undertaken lightly by persons without adequate training. Many aftermarket trigger systems are available for some of the common factory rifles like Remington, Howa, Ruger, Mauser and others. Some may or may not be a significant improvement over the factory standard unit and some may still require a gunsmith to fit and install them for you. Prices can range from $100 - $600 dollars for some three-lever type triggers. Again, it's best to consult your gunsmith before you buy anything and sometimes you may be able to get by with having the factory trigger re-worked by your gunsmith.

This article is just a brief overview and is not in any way exhaustive. Whole articles could be written on each of these component sections, but this should just help to provide some additional information to assist you in your custom rifle build.

In the third part of this series we will look at taking delivery of your new rifle, initial running in and testing, and some suggestions to help with the load-development process. R&R