FROM THE GUNSMITH'S BENCH
RIFLE ACTIONS

Choosing the correct action for your hunting rifle, target rifle, or tactical rifle project is the first, and one of the most critical decisions you are faced with. Even if you have the best barrel, stock or scope available, it could all be in vain if you start with the wrong action.

There is a large selection of bolt actions currently available for various applications. Some people like lever action rifles while others prefer semi-auto actions. The AR15 market in the US is now absolutely huge and although the 'black rifle' has been slow to catch on in NZ (largely due to import restrictions and exorbitant prices), a recent increase in A-Category AR15 type rifles on the market here does seem to be bringing the prices down.

All rifle actions have their strengths & weaknesses and pros & cons. Some guys insist upon features such as Mauser-style 'controlled feed/extraction' for their hunting rifles, whereas this could be not such a wise choice on a target or varmint rifle. As well as getting some good advice from a competent gunsmith or armourer, you need to decide exactly what it is that you require from your rifle regarding performance and weight, and whether it is going to be a dedicated single application or multi-purpose rifle.

SO WHAT DO YOU WANT?

* A lightweight, highly accurate hunting rifle
* A highly accurate, large calibre rifle where weight is not a major concern
* A highly reliable, larger bore dangerous-game rifle, where high accuracy is not paramount.
* A multi-purpose target/varmint/hunting rifle – medium weight with a high/good accuracy requirement

The next decision, and it's a biggie, is do want a new 'custom' action, a standard factory-grade action or a 'trued' factory action. The choice here will depend on cost, whether or not a factory action will meet your requirements or whether it will meet your requirements with some work.

A good custom action should be mechanically straight and true, and have features that set it apart from the factory-grade offerings. These may be things like

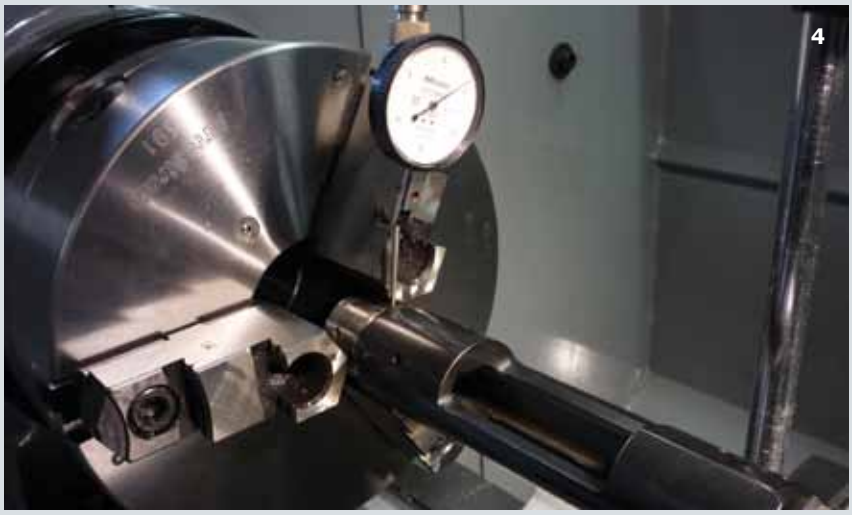
Factory grade actions are produced in larger volumes, and often to meet a specific price point. Some can be more expensive and have good features or attributes, some can be good and strong yet reasonably priced while others can have a host of flaws in them that may or may not be repairable.


1


2


3

RIGHT TOP: Here we have set up the action on a precision mandrel system with appropriate sized bushings. The mandrel is set up between centres on a high precision tool room lathe. With the action running true on its bolt raceway hole the receiver face total indicated run-out is 0.0003", which is actually relatively good for this sort of action. I have seen some with high-spots running 0.008" out of true! Running the indicator down the action side also indicates some irregularities – mainly due to polishing and roll-stamping.



Here we have machined a custom-threaded stub (in one set-up) to make a snug fit to this action. When the chuck is turned, (with the action screwed in) the action now rotates on the central axis of the female threads of the action. The total indicated run-out (TIR) on the receiver face now measures 0.004". However, when we re-fit the bushings and mandrel to the bolt raceway we can see now a TIR of 0.012" at the rear or the mandrel (PHOTO 2). This demonstrates that the action threads are not concentric with the bolt raceway, and are not perfectly square with the action face. These are common problems on factory actions, but can be solved with good gunsmithing. A poor thread/shoulder junction can be one cause of flyers. The indicated run-out on the action's outer surface also measures 0.006" (PHOTO 3), which shows that the threads are not concentric with the action's circumference either.

Sloppy bolt/action fit total 0.007" of play. Probably no issue on a bush rifle, but can cause frustrating flyers or vibration issues on a target or varmint rifle. This problem can be solved with gunsmithing. Sometimes in these cases, the bolt contacts only on one lug.

A very heavy barrel fitted to a lightweight sporter action – here you can see the twisting stress exerted on the action when the barrel is free floated. The deflection on the weak side-rail measures 0.0003" on this action which has a 25" barrel, weighs approximately 6lbs and has an outside muzzle diameter of 0.885". If a 32" long 7lb barrel was fitted this deflection would be even worse.

increased rigidity, larger diameter bolt, thread tenon size or just better metallurgy, fit and finish. They will usually cost more but, if you buy wisely, then that extra initial financial outlay could end up being a cost saving in the long run and possibly a better investment.

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Let's have a look at a fairly popular mass-produced factory action (not named) and see how it checks out. Ideally, the action's centre-line central axis (the bolt race-way hole) should be the datum or reference point and all dimensional surfaces of the action should be parallel, concentric or square to this datum.

The days of building custom rifles on old Mauser actions are just about over and the sporterising or re-building of old P-14 or M17 Enfields is pretty much ancient history. It is now virtually impossible to have either of these re-barrelled for less than the price of a brand new sporter, let alone the added costs of modifying all the bits on the action that

Four Barnard actions with four Ultra-Match barrels combined with high quality gunsmithing equals four accurate rifles and four very happy customers. The NZ-made Barnard actions are always a good choice for a very straight, very true and very rigid action. This is especially so where a long or heavy free-floated barrel is required. For a single-shot-only application, they are my first choice. Note that they are not a lightweight action. Shown here are three model PL actions for .338 Lapua and a model S action. The PL actions come with their own Barnard trigger, whereas the Model S takes any Remington 700 compatible trigger.

Surgeon Rifles make a series of actions that have a lot of desirable features for hunting, tactical or long range rifles where a magazine function is required. Here a model 1086 action is shown with an integral 20 MOA Picatinny rail and an integral recoil lug (instead of a Remington / Savage / Marlin style 'washer' lug) creating a strong, rigid and reliable action. Actions that are hardened prior to final machining will usually be less prone to distortion and will therefore be more true and straighter than the mass-produced actions.

need changing or correction. The metallurgy or heat treatment of some old actions can also be a bit dubious. Most actions made after WWII are usually of better quality steel but a lot of the commercial sporting actions made new from the 1960s onwards are your better options as a starting point if you don't want (or can't afford) a custom action. At the end of the day, the choice is yours.

In a future article, I will discuss the truing or blueprinting of a factory action, some of the steps that are taken and why they must be done. The cost of truing a factory action depends largely on what work is required and the time taken to do it. Custom actions also vary greatly in price, and some of the costs and hassles associated with exporting actions out of the US and into NZ now are considerable. Many US-made custom rifle actions (and other products) cannot currently be exported at all, due largely to the compliance costs and red tape associated with dealing with the US State Department. Unfortunately the bureaucrats have made being 'registered to export' uneconomical for many small firms. This is hardly going to help the US financial situation any time soon, but oh well… thanks Obama!