



Welcome to RPS Rifleworks—Riflesmithing!

Customers are #1

Custom Rifles

A complete custom rifle is a system and that system depends on individual components for the utmost in accuracy and precision shooting! All the components work together. A significant deficiency in one will negatively impact the performance of the rifle.

Why build a custom rifle?

There are a multitude of reasons. Typically the journey in shooting is long, filled with many experiences and many different rifles; most of which are mass produced factory rifles. Ones hunger for accuracy often leads to re-loading which enables "all" rifles to be tuned to their greatest potential, yet in the end with a factory mass produced rifle, we are left in want. Fortunately, custom rifles are available to fill this void; welcome to RPS Int'l Inc.



At RPS customer satisfaction is number one; a commitment taken very seriously. Our primary focus is the production of the highest quality custom bolt action rifle possible, and consequently we utilize only the best state of the art components available today.

Sub-MOA accuracy! Whether you are wanting to build a complete rifle from scratch or enhance the performance of a rifle you already own you have come to the right place.

Every aspect of your build is important and fit and finish is paramount. To deliver accurate and consistent down range results we believe all theoretical advantages must be applied.



Today's hi-tech world has enabled our machining industry to produce the highest quality, tightest tolerance actions to date. Seemingly expensive custom actions are now relatively affordable. Coupled with computer numerically controlled (CNC) machinery we have sound design, sound programming and high level machining skill sets (a machine alone will not yield the desired results). Some high quality custom action currently available are (no particular order): Bat, Viper (Stiller), Borden, Surgeon, Farley, Kelbly, Barnard, RPA, and Hall. Now selecting an appropriate action for the project can be challenging.



At RPS, over 30 years of experience will help simplify the process!



We offer and maintain an inventory of a variety of premium benchrest barrels. Single point cut & button rifled barrels are available: Krieger, Lilja, Bartlein, Rock, Shilen, & Hart.

For your full custom build, each barrel is inspected with a bore scope and slugged.

Chambering @ RPS is performed through the lathe headstock. Dual spiders allow the barrel to accurately positioned to obtain zero run-out at the critical locations inside the bore without bending the barrel. Barrels are manufactured with precision, but the bore never runs perfectly straight, never! Our technique will ensure chamber and subsequent bullet alignment. If this technique is not applied, a misaligned and oversize chamber is likely to result. To compensate for imperfections and to achieve perfect bore to chamber alignment spiders are required. DTIs (dial test indicators) accurate to 0.0001 help make this possible. Indicators establish muzzle peak and are used to index TDC (Top Dead Center) of the barrel relative the receiver. Once dialed in the barrel tenon and chamber are precisely machined in one setup.





CHAMBER POLISHING

At RPS we use min. spec. reamers. These gems are specially reamers produced to exacting tolerances to produce the tightest chamber possible for long brass life and best alignment. Polishing chambers is best avoided and the reason is simple...it makes the chamber larger and is difficult if not impossible to perform uniformly. In addition, it can significantly increase bolt thrust which can result in galling of the action lug mating surfaces.

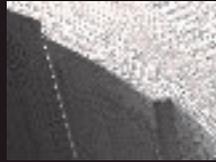
STOCK FIT

We believe a custom rifle should maintain smooth proportional lines. Metal surfaces should flow with the stock (wood or synthetic) lines without gross interruptions or steps. In rare cases, some suppliers fail to retain these basic principles and if the right questions are not asked at the time of the order (or prior to the build), the unwary customer can find himself with an ugly duck or higher costs. We have all seen them ... protruding (or submerged) bottom metal, barrels so heavy the stock forend side walls are virtually gone!

The Custom Rifle.....



BARRELS....



Barrel threads are precisely finished to ensure proper receiver to barrel fit. Threads are further lapped to ensure optimal fit and repeatability on removal and replacement (switch barrel applications).

Barrel length and contour are often debated. Our philosophy is that there is a balance and the primary objective of the rifle should govern length and barrel contour. This objective will often influence the stock style and again the barrel contour. Basic principles fit and finish are applied to each rifle.

We all know you cannot add barrel length but at anytime you can reduce barrel length. Barrel lengths are sized accordingly, saw cut and then meticulously finished to either an 11° or 90° crown.



Our preference are Jewell triggers, however we know there are many excellent triggers and consequently, we offer a variety of alternatives.

• TRIGGERS



• STOCKS

RPS International provides one of the largest selections of stock options. From military tough (synthetics and alloys) to natural woods (solid and laminated). Competition or pleasure you get what you want.

Services include professional fitting, stress-free bedding, and painting (Polene T). All interior surfaces of the stock are sealed as required.



• BOTTOM

METAL

If a single shot rifle isn't what you had in mind, we also offer a wide selection of bottom metal assemblies from detachable magazines and hinged floor plates made from a variety of materials.

For modifying your favorite standard production rifle see the following pages.....



If you want accuracy less than 1/2 MOA.... You have come to the right place!



RPS Rifleworks.....where second is NOT an option!

Customization of regular sporting actions

TECHNICAL SUPPORT

Technical support available at RPS is generally clear—black and white! My mechanical engineering background brings a clear understanding and not a parrot like response we have all heard before. Our specialty is bolt action rifles and your satisfaction is number one!

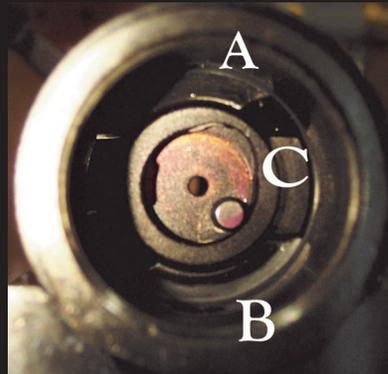
RECOIL LUGS

Often over looked, the recoil lug is a vital component to the accuracy of the rifle. Surfaces not parallel will create misalignment problems and ruin painstaking efforts of receiver accurizing and barrel machining. Surface grinding must be parallel and not every shop can achieve satisfactory results. Thicker heavy recoil lugs are a must to reduce flex and bedding deterioration.



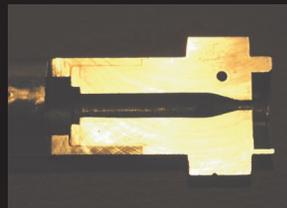
BEDDING

We cannot over emphasize the importance of stress-free bedding. This is a must particularly after accurizing an action. Improper bedding of a typical banana shaped receiver will diminish the value of an accurized receiver!



Upon Request, “Factory Class or Mass Market” actions (Remington, Winchester, Tikka, Sako, Savage etc.) are also reworked to custom action tolerances.

The image to the left is of a Remington 700 action looking at the interior of the receiver from where the barrel would normally be positioned with the bolt resting in the bolt raceway. Highlighted next to letters are tell-tale signs of the basic reasons for accuracy problems in a mass market action. Letters “A” and “B” show the receiver recoil lugs, top and bottom respectively. You will see the top lug is completely black (no contact) whilst the bottom lug “B” is partially black. The bottom lug is partially silver due to the black oxide being worn off from contact with the right bolt recoil lug (“C”) as it rotates past the stationary receiver lug @ “B” when the bolt is opened and closed. Both lugs should bear evenly on the receiver. In this instance the bottom lug utilizes approximately 65% of its potential contact area; the top 0%. Just to the left of letter “C” you will see the bolt face (the area that the cartridge base rests when chambered). Here one can see uneven deposits of brass on the bolt face which is likely due to assembly misalignment (Chamber out of alignment, receiver face not square or the bolt face not square to the bolt raceway).



The photo (left) shows a sectioned Remington bolt body (compliments Ted Gaillard). From the photo we can see firing pin support and the multiple pieces used in the assembly of what looks like a one piece bolt—less the soldered on bolt handle. Now keep in mind, the original action was intended to meet a low price point and it is easy to see how precision machining and fitting techniques can help improve alignment and reduce clearances on these multi-piece assemblies.

Areas of the action typically accurized

Action body or Receiver

- Exterior: generally the exterior of the action is not reworked or ground as cylindrical deviations can be economically accommodated through proper “stress-free” bedding.
- Interior: modifications executed here is where improvements in consistency and accuracy are achieved.

Bolt Raceway— the bolt bore (raceway) is reamed to improve alignment and create a stable smooth working datum point.

Threads—single point cut concentric to the bolt raceway.

Recoil lugs and receiver face—single point machined precisely 90 degrees to the bolt raceway with the same setup which re-cut the threads.

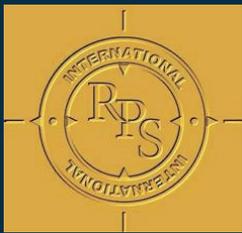
Receiver Bolt

- Nose: Bolt face, recoil lugs front/back and nose all precisely machined as required.
- Body: Sleeved front and rear. Firing pin bushed as required.



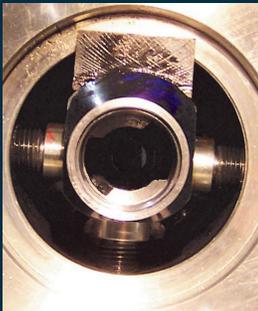
Customization continued...

Reworking actions in the shop.... THE RECEIVER

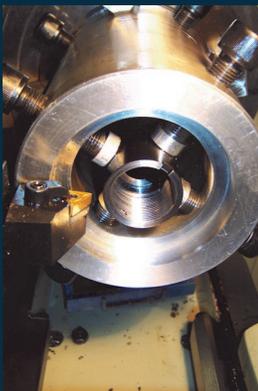


RECEIVERS ACCURIZED

The photo shows a finished Tikka M65 receiver.

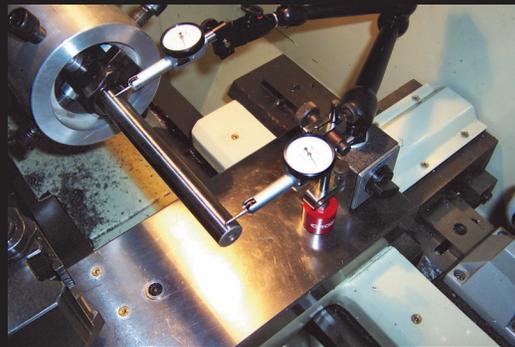


The following photo shows a completed Savage action.



BOLT NOSE

Typical Remington 700....



Receiver machining is accomplished with a special vibration dampening jig equipped to manipulate the receiver in two separate planes each plane equipped with 4 adjustable points. Consequently the receiver can be perfectly aligned with the axis of rotation of the lathe.

Alignment of the receiver center (raceway center) can be witness with a precisely fitted mandrel protruding from the receiver. The photo shows two DTIs accurate to 1/10,000" being used to measure total indicator run-out (TIR) which enables actions to be centered with "0" run-out! Once aligned machining can commence. Receiver threads are single-point re-cut concentric, receiver recoil lugs and receiver face or shoulder squared (90°) with the bolt raceway. All machining operations are executed with one setup! The action shown in the photos is a Tikka M65 receiver, although almost any action can be corrected with this setup.



We accurize a wide variety of bolts. Bolts are often reworked with a bushed firing pin to correct firing pin alignment issues and prevent primer cratering. Bolts are also sleeved once the receiver has been reamed to ensure a straight and constant bore diameter. Clearances between the receiver raceway and the sleeved areas of the bolt are typically as low as 0.001" or less.

The sleeving operation eliminates the bolt cant caused by excessive factory clearances coupled with the vertical lift from the trigger (sear faces at the rear receiver bridge.) This vertical force causes the top lug to disengage, the degree of which is more severe in short actions (short bolts). Excessive clearance and the resulting cant is responsible for vertical stringing (*Harold Vaughn—Rifle Accuracy Facts*).

Bolt noses are reworked to ensure concentricity and squareness / perpendicularity (both sides).

Also offered are newly fabricated replacement bolts for Remington Actions . These new bolts are intended to eliminate custom machining. The photo above shows a sample in a Remington Short Action 700.



Installation of accessories (muzzle brakes etc.) , metal finishes, engraving and painting discussed elsewhere on our website!



Thank you for visiting with RPS International!