

Unshakable Foundations

The Savage AccuStock

The Savage Model 110 bolt-action rifle has always been a fundamentally sound platform. Now an all-new foundation ties together its time-tested features to produce a rifle with even greater potential for overall accuracy.

BY AARON CARTER, Managing Editor



When a company's slogan proclaims "The Definition of Accuracy," and its latest catalog touts in bold letters, "The Science, Art and Culture of Accuracy," the company is either extremely confident in its product or downright foolish. Fortunately, for Savage Arms the latter is not the case. Time and again the Model 110, and its numerical variants, have delivered unprecedented accuracy, especially for the price. But until recently the company had yet to tap the 110's full potential.

Molded into the stock, the aluminum "spine" enhances both fore-end and action rigidity. The clear AccuStock (above and r., top) is for illustration only.

A Commitment To Accuracy

Unveiled in 1958, the Savage Model 110 was the brainchild of Nicholas Brewer and, from the outset, had many features that made it both economical and accurate. In fact, so good was the design—until recently, only a few minor changes were made—that Savage Arms CEO Ron Coburn banked the future of the company on the 110 when he took it over in 1987 and was looking for ways to concentrate efforts only on those products with the greatest potential. He knew the rifle was a fundamentally sound platform that was well-deserving of further refinement and continued quality control.

What makes the Model 110 and its variants, so accurate? In short, it's the combination of several features, some of which also make it economical. The barrel locknut, for example, offers not only several manufacturing advantages—cost efficiency and increased production rate—but promotes accuracy as well. The design permits precise setting of head-space and assures 100 percent lug engagement. The locknut is first threaded onto the barrel, followed by the collar-type recoil lug, and then the barrel is partially threaded into the action. The bolt is then closed on a “min” gauge and the pre-chambered barrel is threaded down tight against it, at which point the locknut is snugged to secure the barrel and recoil lug in place.

Manufactured from a host of easily made parts, the bolt's contribution to accuracy resides in its separate, deeply recessed head, which fully supports the cartridge. The head is slip-fit into place and is pressed forward by a spring washer, allowing a few thousandths of an inch of movement, which promotes self-adjustment of the locking lugs.

Further, there is the 110's button-rifled barrel, which, according to the company's literature, derives its accuracy from: “The straightness of the bore, the uniformity of the rifling geometry, the concentricity of the chamber and the exactness of the crown ...” Truth is, after the drilling, broaching and rifling processes, every Savage barrel is checked for deformities and, if necessary, hand-straightened.

For liability reasons, trigger pulls were traditionally set very high, condemning even the most accurate rifles to sub-par performance. For decades, the Model 110 was no different. But, in 2003 Savage, acting on customer feedback, took a bold step forward and unveiled its AccuTrigger—a feature now found on most modern Savage rifles. The AccuTrigger features the integrated AccuRelease, which must be completely depressed to discharge the firearm. The AccuTrigger cannot accidentally discharge during normal use, even when jarred or dropped and, after removing the stock, the return spring can be rotated with the supplied tool to adjust pull weight. It can be set from 2 lbs., 8 ozs. to 6 lbs. on most Savage rifles, and 1 lb., 8 ozs. to 6 lbs. on Model 12-series Varmint and Law Enforcement-series rifles. Best of all, there's no creep or overtravel.

Yet, even with all its accuracy-enhancing features, there remained one component in the Model 110 platform that had yet to be addressed ... until now.

Building A Better Foundation

“Prairie dog shooting is one of my favorite avocations,” wrote Coburn in a recent e-mail. “It's fast and furious, tests my long-range skills, and allows me to torture our products in a real-world environment. And, it was this type of shooting that illustrated Savage Arms could make the modern synthetic rifle stock even better.”

“Synthetic stocks have many advantages, including manufacturing expediency, cost effectiveness, resistance to moisture, low maintenance, light weight, and durability,” explained Coburn. “But, without the rigidity or temperature integrity of hardwood or laminate stocks, they're easily bent, torqued and prone to sag, the latter of which is a particular concern during hot weather or when barrel heat becomes excessive. When the barrel is no longer free-floating, accuracy is affected. Hence the concept for the AccuStock.”

Although the original purpose of the AccuStock was simply to increase stiffness, Savage Arms personnel envisioned the new stock serving multiple functions. According to Director of Engineering Chris



Bezzina, “By designing a lightweight synthetic stock that clamps the action in five planes we were able to improve on initial designs of increasing stock rigidity and leapfrog our technology into total action rigidity.”

Through the use of high-speed photography, Savage engineers confirmed that, under recoil, the barreled action in a traditional-style stock moves in a predictable pattern. It first moves rearward until reaching its maximum deflection, then rebounds forward and rearward again until the energy dissipates. “Ordinarily the recoil lug prevents most of the rearward movement, but the action is free to move upward and forward with the rebound,” stated Coburn. “We decided the action should be completely secure and recoil should take place as a full assembly, including the stock.”

But, there were considerations in designing the AccuStock, the first of which was economic. “We wanted to keep costs down by insert-molding the aluminum spine into the stock, effectively making it a one-piece assembly and, at the same time, bed the action at least as well as aftermarket stocks that are substantially more rigid (and expensive) than factory stocks,” wrote Coburn. Bezzina also pointed out that by insert-molding the rail into the stock the company gets repeatable alignment between the action and the stock inletting.

How is spine alignment maintained during the molding process? According to Bezzina, “The aluminum spine is secured into the plastic mold via precision fixturing prior to the injection-molding process, which ensures the rail doesn’t move under the extreme pressures and temperatures of the thermo-set polymer injection process.” Interestingly, the spine keeps the stock dimensionally stable during the molding process. How? “The rail acts as a cooling jig while the stock stabilizes after the thermoplastic has been injected into the mold,” wrote Bezzina.

Heft was also a concern. To keep weight at a minimum, the 14½"-long AccuStock rail, or spine, is fashioned from an aircraft-grade 6061-T6 aluminum

extrusion, and weighs a mere 6.4 ozs. It extends from just shy of the receiver’s rear forward of the front swivel stud, which itself is secured to the rail for strength, particularly when using a bipod.

The AccuStock Explained

Unlike conventional stock designs in which a screw, or multiple screws, secures a rifle’s action, resulting in rigidity only on a vertical plane, the AccuStock incorporates a “three-dimensional” bedding system. As the AccuStock’s two action screws—identical to those on Savage’s non-AccuStock models—are tightened, the action is chocked inside the bedding cradle, which applies both horizontal and vertical pressure, preventing up, down, left and right movement.

“The AccuStock’s bedding cradle is slightly narrower than the receiver, so when the action screws are tightened the side rails flex and conform to the outside diameter of the receiver, thereby significantly increasing the clamping force of the receiver into the stock. The side rails spread more than 0.010" before the receiver rests on the bottom rail boss, providing a solid foundation for the action to bed against,” explained Bezzina.

To eliminate forward and rearward motion, which is traditionally achieved by glass-bedding, the AccuStock’s bedding cradle features a rearward-sloping cutout for the recoil lug with an innovative twist. A third action screw works in conjunction with a wedge-shaped block measuring 0.562"x0.220"x0.339" that, when the screw is tightened, pulls the wedge downward, cinching the collar-type recoil lug against the aluminum rail, thereby preventing movement.

Testing The AccuStock

To evaluate the virtues of the AccuStock system, I first shot an AccuStock-equipped Model 116, firing five consecutive, five-shot groups with three ammunition types at 100 yds., then removed the barreled action and placed it in a standard synthetic stock that

SHOOTING RESULTS (100 YDS.)

.30-'06 SPRG. CARTRIDGE	VEL. @ MUZZLE (F.P.S.)	ENERGY (FT.-LBS.)	GROUP SIZE IN INCHES			GROUP SIZE IN INCHES		
			SMALLEST	LARGEST	AVERAGE	SMALLEST	LARGEST	AVERAGE
			WITH ACCUSTOCK			WITH STANDARD STOCK		
HORNADY No. 8112 150-GR. GMX	2945 Avg. 13 Sd	3,467	0.94	2.19	1.39	1.44	2.19	1.69
HORNADY No. 8518 LIGHT MAG 180-GR. SP	2839 Avg. 15 Sd	3,223	0.57	1.94	1.19	1.57	2.70	1.92
NOSLER NOSLERCUSTOM No. 60058 180-GR. BT	2742 Avg. 31 Sd	3,006	0.94	1.32	1.17	1.19	2.19	1.82
AVERAGE EXTREME SPREAD					1.25			1.81

NOTES: ACCURACY RESULTS BASED ON FIVE CONSECUTIVE, FIVE-SHOT GROUP FIRED FROM A CALDWELL LEAD SLED AND TARGETS PLACED AT 100 YDS. VELOCITIES MEASURED FOR 10 ROUNDS WITH AN OEHLER MODEL 43 CHRONOGRAPH. AVERAGE AMBIENT TEMPERATURE 88° F. HUMIDITY 15%. ABBREVIATIONS: BT (BALLISTIC TIP), GMX (GILDING METAL EXPANDING), SP (SPIRE POINT), Sd (STANDARD DEVIATION).

was modified to accept the AccuStock model's barreled action, then repeated the test—for an apples-to-apples comparison. The Model 116, chambered in .30-'06 Sprg., was topped with a Nikon Buckmasters 3-9X 40 mm scope in DuraSight rings on Weaver bases. Per Bezzina's instructions (see sidebar p. 74), the action screws were tightened to 45 in.-lbs. using a Wheeler Engineering FAT Wrench.

Because the range was 88° F throughout the testing phase, barrel cooling was non-existent; in fact, the stainless steel barrel remained nearly untouchable. But, the conditions—excessive barrel heat and outside temperatures and fore-end pressure applied by the Caldwell Lead Sled—were similar to those Coburn described when explaining how synthetic stocks lose integrity, then torque, bend and sag. If testing were going to reveal the benefits of the AccuStock, this would be it ... and it was.

With the AccuStock, the most accurate ammunition tested in the Model 116 was Nosler's NoslerCustom 180-gr. Ballistic Tip load, which averaged 1.17". Not far behind, though, was Hornady's Light Mag 180-gr. SP, averaging 1.19". Unlike the AccuStock-equipped version, however, which retained the free-floating nature of its barrel throughout testing, it was readily apparent that the Model 116 action in the standard synthetic stock didn't, as the rifle exhibited stringing, shifts in point of impact, and unexplainable fliers. With this, the average group size increased dramatically. The NoslerCustom average grew to 1.82", and the Light Mag went 1.92". Interestingly, Hornady's 150-gr. GMX load produced the best average with the standard stock, measuring 1.69". There was an obvious across-the-board improvement in accuracy with the AccuStock.

Of note, though, during testing the action screws of the AccuStock backed out slightly. The extent to which this affected accuracy I'm unsure; however, it's good to be aware of the possibility of it occurring.

Although the AccuStock will undoubtedly enhance the accuracy potential of a given Savage rifle, the degree to which it does so will vary depending on a number of factors, including the individual firearm, barrel contour, chambering and ammunition used. For example, a bull-barreled rifle in .308 Win. shot with match ammunition is unlikely to exhibit the same degree in improvement as a sporter-weight rifle chambered in .270 Win. and loaded with standard hunting ammunition. In other words, a rifle that shoots to sub-m.o.a. levels stands to gain less than one that shoots to 1½ -m.o.a. levels. Still, any gain in accuracy should be appreciated, especially given the small increase in weight and cost.

Although the AccuStock system has many benefits to the shooter, one of the most important benefits to the company is its bottom line. Not only will the



A third action screw works in unison with a wedge-shaped block (above, l.) to cinch the collar-type recoil lug.

AccuStock make the rifles more appealing to consumers, and thereby increase sales, but because accuracy is enhanced, fewer rifles will be rejected for not meeting the company's 1½ -m.o.a. accuracy guarantee. It's a win-win situation for Savage Arms.

AccuStock Models

Because of the AccuStock's unique design, neither the stock nor the barreled action of AccuStock-equipped models will work with said components of prior Savage Model 110s, or its variants; therefore, upgrading an older rifle isn't an option. But, don't fret, as the price difference between AccuStock-equipped models and non-AccuStock rifles is marginal—less than \$100.

AccuStock-outfitted models have several features that distinguish them from their counterparts, including: a smooth barrel locknut (as opposed to the notched version); a bolt release in the front of the trigger guard (instead of on the right, rear side of the receiver); and a third action screw. Currently, AccuStock models are available in the Model 10 line, including the new Precision Carbine, FCP, BAS and BAT/s, as well as several iterations in the Model 11/111 and 16/116 series.

Savage Arms has a long history of innovation, particularly the kind that enhances accuracy and value. By changing the very foundation of the rifle on which the company's reputation resides, with the AccuStock, Savage delivers on its slogan, "The Definition of Accuracy," like never before.

For more information, contact: Savage Arms (Dept. AR), 100 Springdale Road, Westfield, MA 01085; (413) 568-7001; www.savagearms.com.

Proper Adjustment Of The AccuStock

THERE IS A SPECIFIC TECHNIQUE FOR ASSEMBLING THE ACTION INTO THE AccuStock, AND IT NEEDS TO BE STRICTLY ADHERED TO AS FOLLOWS:

1. Ensure that the recoil lug “wedge” screw is backed out to the point where the wedge has sufficient vertical movement to allow the recoil lug to seat against the bottom of the aluminum rail.

2. With the action inserted into the stock, justify the action toward the rear of the stock to allow the recoil lug on the action to be seated against the boss on the aluminum rail.

3. Tighten the forwardmost screw to 10 in.-lbs. to seat the action against the aluminum rail boss, then back out one-half turn.

4. Tighten the middle action screw to 10 in.-lbs.

5. Tighten the rear action screw to 10 in.-lbs.

6. Tighten the forward action screw to 10 in.-lbs
Repeat steps four through six and increase torque value in increments up to a final torque value of 40 to 45 in.-lbs.

NOTE: It is extremely important to tighten per the instructions above because when you are tightening the action down into the AccuStock you are spreading the aluminum side rails and evenly moving the action down onto the base of the rail, ensuring positive engagement.

—CHRIS BEZZINA, SAVAGE ARMS