

REPLACEMENT RIFLE TRIGGERS

(BY RIFLE BASIX AND TIMNEY)

By Norman E. Johnson

Over a period of years numbering threescore and two, I have been pulling triggers — even yanking a few at times. But starting with an air rifle, the gun trigger has served me well, and I have come to trust it. An average hunter and shooter may not fully understand trigger function ... that which takes place as a gun is cocked, followed by trigger pull and the fall of the hammer or striker. It is not absolutely necessary to know all about trigger function if one knows what a good trigger should feel like. As long as a trigger makes a gun shootable, most shooters will tolerate a fairly wide margin of acceptance. It's when a trigger is really bad news, or if the safety fails to function properly that shooters come to realize it is one of the most important parts of a firearm.

Webster defines a trigger as that part of the action moved by the finger to fire a gun. The sear is further defined as the catch that holds the hammer of a gun-lock or half cock. So the trigger, per se, is a small, downward protruding lever attached to a gun with a pivot pin to serve as a fulcrum. In the most simple form of trigger function, as a hammer is cocked, the spring loaded trigger engages a catch in the hammer which prepares the gun to be fired. Then as the trigger is pulled, it releases this catch or step, and the spring driven hammer falls upon the firing pin. This form of firing mechanism is seen

on the various revolvers and single-shot rifles or shotguns. Adjustment of this type of trigger is very limited, however, involving polishing or honing of the mating surfaces or altering trigger spring pressure.

Other triggers are more complex in design — for example, the double stage or double-set type. Many of these were quite common on European rifles but also are installed on many American guns, including conversion kits applicable to many guns. The primary purpose of the double-set trigger is for lighter adjustment. This is accomplished by pulling the rear trigger of the two, which sets the front or firing trigger to a substantially lighter pull. My predominant experience with the double-set trigger involves three Thompson/Center TCR[®]83 single-shot rifles. This is a very nice trigger and is easily adjusted to a lighter and still safe pull weight. Another type of trigger that provided a lighter pull was the Canjar single-set trigger mechanism. Here, the trigger shoe is pushed forward and a small tab extends ahead of the main trigger shoe. The gun then can be fired as the tab is moved rearward — the result of a much lighter trigger pull. In the unset position the gun also could be fired with normal, unadjusted trigger pull weight.

The vast majority of modern day rifles are equipped with quite shootable, single-

stage triggers. Within a box-like metal case (called the trigger housing) the pivotal pinned trigger protrudes downward into a trigger guard. The upward portion of the trigger engages with the sear, which in turn holds the hammer or striker from going forward — under spring-loaded force — until the trigger is pulled. This basic style trigger is used by such manufacturers as Remington, Ruger, Weatherby, Sako, Savage, and a host of other gun makers. The famous Model 70 Winchester trigger differs markedly and is not encased in a housing, as the aforementioned units are. The Model 70 trigger, by design, provides a sound and safe system of shooting. It has remained essentially unchanged for many decades. The striker/firing pin rests against the upper part of the sear, which engages with the trigger catch. Both the trigger and sear have their own springs, as does the striker. The Model 70 trigger is quite limited for adjustment, but can be adjusted to a safe and somewhat lighter pull. Its safety is of the positive, crossbolt type. Inherent to the function of all triggers, the hammer or firing pin mainspring feeds tension back into the trigger pull weight. This spring force is one of the leading causes for variations in trigger pull adjustment, which makes trigger adjustment more problematic.

I am reminded of the importance of

trigger function while I served in the U.S. Marine Corps. It was 1953 and I was a gunner on a 75mm recoilless anti-tank gun. The portable gun weighed 167 pounds and was carried over rugged terrain by four Marines within the squad. Another carried the hefty tripod, several others each carried a couple of rounds of ammunition strapped to a carry board. As a team effort we could be very efficient. Countless times while training, the command would come: Enemy tank, XXXX yards, along with its position. Immediately the tripod carrier slammed the tripod into position and the portable recoilless rifle was placed on the tripod where it balanced and traversed quite well. As gunner, I carried the optical sight, which locked onto a dovetail mount on the left side of the gun.

On a special maneuver we were demonstrating our skills as ready Marines before an elite gathering of officers and important civilian dignitaries in the back hills near Camp Lejeune, North Carolina. A huge tank was being pulled along in front of us about 150 yards out, being used as a sacrifice for effect. The command came: "Enemy tank, 150 yards, load one round of armor piercing ammo." Anyway, down went the tripod followed by gun placement. Instinctively I placed the gunsight onto its mount and my eye was on it. As I maneuvered the gun I found the moving tank in my sight. I knew precisely how much to lead the tank as the command came. "Fire when ready!" Everything was perfect as I followed the tank in my sights and depressed the trigger ... but nothing happened. Again, "Fire when ready!" This time the gun fired after a great deal of force was applied to the malfunctioning trigger, and the huge tank was finally incapacitated.

The trigger was later repaired, but any keen observer would have seen this as a flaw in our battle maneuvers. As military triggers go, I had never seen or experienced a trigger malfunction on the trusty, old M-1 Garand rifle.

TODAY'S MODERN TRIGGER

The whole crux of the problem with triggers is to find a good, crisp, adequately adjustable and safe mechanism that will be free of excessive tension, creep, and overtravel. Too light or too heavy a trigger really introduces problems into the equation. A typical "lawyer's trigger," as found on a good number of today's guns, has an excessive pull weight often exceeding 6 pounds or more. It's almost as if these guns were not meant to be used in hunting or to be fired at all for that matter. Conversely, a really light trigger, in the hands of many shooters, presents a real problem — especially in hunting situations. Too light a trigger, especially one that is far below safe adjustment, is subject to unintended discharge, often resulting in slam firing. Slam firing is a dangerous condition, which causes a gun to fire as the bolt or breech is closed rapidly. Improper sear/trigger engagement is usually the culprit. It is my experience after working with many hundreds of guns, particularly hunting rifles, that a 2^{1/2}- to 3-pound trigger, free of excessive creep and overtravel, serves the needs of most shooters. However, I am not one of these shooters. I prefer a somewhat lighter trigger, especially where I may be testing a rifle for accuracy. In this case I may prefer a really good, safe trigger around a pound of pull. I shot a large, black bear last fall while using my converted TCR'83 double-set trigger set at about a pound. I certainly wouldn't have

wanted to be wearing a glove as I touched off the shot that killed the bear. I'll admit to having some of my lightly adjusted triggers discharge a mite early as I lay there with my rifle over my shooting pad, aimed at a distant winter canine predator, especially when I could barely feel my cold fingers pull the trigger.

The average rifle is capable of delivering far better accuracy than most shooters are capable of holding and firing the gun — even from the best benchrest setup. This is particularly true where trigger pull is somewhat heavier than it should be.

As a production trigger, the Remington 700 comes quite close to being a model trigger. I'm not going to single out this trigger as being the best, but it is an excellent example of today's modern production rifle triggers. While these features are not exclusive to the Model 700 trigger, it is adjustable for weight of pull, overtravel, and trigger/sear engagement. Many of these triggers can be quite safely adjusted to a couple of pounds. I use the word couple as implying an indefinite small number. Any type of trigger adjustment should be undertaken only by those experienced in this area and with a great deal of care and caution. This is particularly true as sear/trigger engagement is significantly reduced and spring tension lightened.

The Remington Model 700 family of triggers, and this will include several of today's modern triggers, shows us a fairly complex mechanism. The 700 Remington trigger has been around for some 40 years. Inclusive of the safety and bolt stop, there are about 17 parts, including four springs, four pins, and three screws. The function of this type of triggering mechanism is quite

simple. As the bolt is raised, it cams the firing pin rearward. The underside of the firing pin is then held rearward by the spring-loaded sear as it engages the trigger. As the trigger is pulled, it disengages the sear, which in turn releases the firing pin. This trigger is adjustable, but within certain limits with regard to function and safety.

AFTER-MARKET OR REPLACEMENT TRIGGERS

A number of after-market or replacement triggers is available to a hunter/shooter, offering advantages over the factory versions. The primary advantage of these triggers is a wider range of adjustability and smoother, crisper function. Some of these replacement triggers are fully adjustable down to as little as a couple of ounces.

This article will cover triggers I have recently used as provided to me by Rifle Basix, P.O. Box 23593, Charlotte, NC 28227, and Timney Triggers, 3940 W. Clarendon Avenue, Phoenix, AZ 85019. I'll also cover installation of a sear and spring kit on the Ruger 77/22 rimfire rifle as provided by Timney.

Rifle Basix offers triggers for both Savage and Remington rifles. For Remington and Savage owners, Rifle Basix offers triggers for the Model 700, 40-X, Model 7, 600, 660, and XP-100 — both in left- and right-handed models. Savage models include the 110, 112, 10, 12, 116, in early and late, long and short, left or right. For Savage rimfire rifles the Mark I, Mark II, 93, 900 Target, and Models 501 and 502 are included. These are 100 percent drop-in, ready-to-go triggers. Both the Savage and Remington use the factory safety, however.

You can choose the weight of pull

range to fit your hunting and shooting needs. For example, for the Remington there is a standard trigger from 1.5 to 3.5 lb., a varmint trigger from 8 ounces to 1.5 lb., and the ERV (Extended Range Varmint) from 4 ounces to 20 ounces. The Target trigger ranges from two ounces to 6 ounces of pull. Rifle Basix triggers for the Remington rifle range from \$106 for the standard model to \$138 for the ERV and Target models. For Savage rifles there is a wide selection of pull weight: The Sav-1 ranges from 1 lb. to 3 lb., Sav-2 from 4 ounces to 3 lb., Sav-3 (pistol) from 10 ounces to 1.5 lb., Sav-R from 10 ounces to 1.5 lb. Savage trigger prices range from \$79 to \$149 at the time of this writing. All models are in stock, ready for same-day shipping.

I tested two Rifle Basix triggers designed for the 700/40-X Remington rifles. These were the Varmint — 8 ounce to 1½ lb., and the ERV — 4 ounces to 20 ounces, and both worked out very well. The Rifle Basix triggers come with more than adequate instructions for do-it-yourselfers. But it is very important that trigger parts and nomenclature are clearly understood before you install the trigger. Transferring or reinstalling the safety and bolt stop may cause you to think for a few minutes — but unless you are mechanically challenged, problems should not ensue. I actually timed myself while installing the trigger, requiring safety and bolt stop transfer, and the elapsed time was 20 minutes. There was one little troublesome spring called the “reset spring” that is a bit difficult to align on the underside of the part called the top lever detent. A small amount of cement to bond one end of the spring to the part helped greatly in maintain-

ing spring alignment. Both of these Rifle Basix triggers make varmint and target shooting a pleasure and are well worth the cost and time involved for installation.

The second pair of triggers I tested was made by Timney Triggers. They have been making replacement triggers for more than 50 years. In fact, their Sportsman model, built to fit Mausers, Springfields, and Enfields, dates back to 1946 and is still being made today. Some of the other rifles Timney makes triggers for include Sako, Ruger, Savage, Remington, and the venerable Model 70 Winchester.

The two Timney triggers that I tested were made for the Model 700 Remington or 40-X action. Timney offers these two replacement triggers for the 700 Remington. Of course, I was interested in both of these as a varmint hunter and benchrest/target shooter. The Timney hunting grade trigger is adjustable from 1½ to 4 pounds, and uses the factory safety or is available with a ULA safety. The price of this model is \$86 to \$121. The newest Remington trigger in the Timney line is the Tactical trigger which is for benchrest and varmint shooters. This model is adjustable from 2 to 8 ounces and has no safety. As unique features, the Tactical trigger has a straight, knurled finger piece and can be canted either left or right to fit the finger within the trigger guard right where you want it. The Tactical trigger is priced at \$128.

Both of these triggers, as do the Rifle Basix triggers, install quite easily without special tools, aside from a proper size punch — a squared off nail will do — and a small hammer to tap in the pins. A needle-nose pliers was helpful in the area of safety and bolt

stop installation.

Any serious shooter who wants a really fine after-market replacement trigger will find merits in any of the four triggers I have used and described on these pages. I know I have put up with a number of barely tolerable triggers over the years and have been able to adjust most of them to my needs. There is one caveat you should be aware of when installing an after-market trigger — you could become spoiled and want one on other guns. As you experience the elimination of creep and overtravel with a precisely adjusted trigger at a pull weight you like, your shooting stands to improve.

While working with triggers and sears, this is an opportune time to cover the installation of a Timney sear and spring kit for the Ruger 77/22 rifle. I just happened to have a Ruger 77/22 which was covered in **The VARMINT HUNTER Magazine®**, #35 (July 2000). I had installed an after-market Spec-Tech trigger on this rifle which left the trigger pull weight at 1 pound 8 ounces, and very crisp. Nevertheless, I thought I'd try the Timney sear to see if this part would add anything to an already smooth trigger.

Complete instructions come with the replacement sear. Installation requires but a few minutes, involving removal of the trigger and sear retaining pins. This isn't a situation where a bunch of springs go flying, so not to worry. Anyway, just use a 1/8-inch punch to slide the pins out and carefully catch the parts in your hand. If the barreled action is in a vise, things will go better.

The sear engagement is adjustable via a cemented-in adjustment screw, but optimal engagement is factory set. Also, because of the difference made by the new sear engage-

ment, the safety probably will need to be adjusted. This is done as follows: Check to see if the bottom side of the safety selector clears the safety tab on the trigger when in the cocked position. If there is not sufficient clearance between the safety and the trigger's safety tab, remove the trigger and grind or file the trigger's safety engagement tab until clearance is achieved. Be very careful to not remove too much metal.

The completed installation of the sear and spring resulted in a 1.5 lb. trigger pull — nice and crisp, and a perfect safety selector engagement.

TESTING TRIGGER PULL WEIGHT WITH THE LYMAN ELECTRONIC DIGITAL TRIGGER PULL GAUGE

Over many years I have determined trigger pull weight with a spring loaded scale — which I built. It worked well enough to provide readings from somewhere under one pound to near 10 pounds, and yes, there really is such a thing as a 10-pound trigger.

As I was preparing for this article, I contacted Lyman Products Corp., 475 Smith Street, Middletown, CT 06457, for information on their electronic digital trigger pull gauge. It wasn't long before I had one in my hands — and I'm glad this happened. This is one heck of an instrument for a shooter, which totally removes guesswork from trigger pull.

The Lyman ad that caught my eye claimed the world's first digital electronic trigger pull gauge. Advanced strain gauge technology accurate to 1/10 of an ounce, reading up to 12 pounds, and with a 10-pull averaging function — it even converts ounces to grams. The sheet that came with the scale said it was 20 times more accurate than a

common spring gauge. I guess that would put my old scale to the test.

Anyway, it's a very nice instrument and I can't doubt the validity of the advertisement after giving it a most thorough workout. My first test was to weigh a 1-pound weight that had been verified by a pharmacy scale back in 1978. The Lyman scale showed 1 pound, 0.1 ounce, convincing me it was very reliable. I used a short piece of string to attach the weight to the scale so it, too, must have weighed something.

Triggers can be tested for pull weight with the gun vertical or horizontal. The scale is preset to avoid weighing the trigger pull rod to adjust for vertical or horizontal gun position. The trigger hook has a grooved roller on it to avoid friction at the trigger, and the trigger hook can be turned 360 degrees. Reading the digital scale is easy, as is preparing the program on the scale. A single 9-volt battery powers the unit. The scale sells for around \$50.

As a final measure, I tested several of my rifles — none of which were exactly alike. The Rifle Basix and Timney triggers could be adjusted very precisely within the margins described earlier for each type of trigger.

Installation of a high-quality replacement trigger, particularly on your better rifles, is a good move. Selection of trigger pull weight should be well thought out, however. Too light a trigger for general hunting purposes is not the way to go. But a really good varmint or target rifle may deserve such a trigger. Either way you look at it, there is a trigger out there just for your needs. 