

RETICLE-TRU™ Alignment Device

US Patent # 8800154

A GENERAL OVERVIEW ON THE RETICLE-TRU ALIGNMENT DEVICE

When mounting a telescopic sight on a firearm, it is very important to mount the telescopic sight into the scope rings so that one crosswire of the reticle is either *perfectly LEVEL*, or *perfectly PLUMB*.

A. *I wanted the Reticle-Tru device to function “independent of any external reference objects.”*

The device would stand on its own. In other words, *the device would not be dependent in any way upon various external references*—horizontal references such as either a roofline, a fence, or the lines formed by house siding; *or*, vertical references such as either a pole, the corner of a building, a door or window frame, or a plumb bob on a string. *The device would function without the need for any of these external reference objects—it would stand alone, independent of these—and dependent only upon the reference of the rifle immediately below the scope.* This makes the device very handy, for it can be easily used in the smallest of rooms—even if there are no windows. It can also be used while in the field, where there are typically no readily available “man-made horizontal or vertical reference objects” to obtain visual cues from.

B. *I wanted the Reticle-Tru device to function “without the need for a bubble level.”*

Why? Typically, *to incorporate the manufactured part of a bubble level within a small gadget such as a crosshair leveling device, the costs must be kept down. Typically, this often means that these component parts may not be very accurate.* When one of these is checked against a good quality machinist’s level, they are often inaccurate—perhaps showing a half-bubble off when checked against a good quality level. *This is due in part to the fact that the base of these levels is so short—an inch or two long at the most—contributing to their inaccuracy—as contrasted to a carpenter’s level where the base may be 3 or 6 feet long—thereby keeping the reference points of the two ends of the level quite far apart, assuring some decent degree of accuracy. All of this is compounded when the installer works on the firearm—for slight movements tend to continually move the level off from the reference indexes on the bubble housing. As a result, they must be re-adjusted again and again.*

C. *The practical solution was to utilize only the firearm/scope combination itself—and doing so by taking advantage of certain specific visual cues that are readily available on the firearm/scope combination as it is—right there in front of the installer.*

The RETICLE-TRU is constructed out of solid Acetal stock. As a possible alternative, there may also be an offering machined out of aluminum. Both of these materials are very light in weight, and very easy to machine. The device is approximately the size of a hockey puck, thereby easily fitting into either a toolbox or a range bag. *The tool has no delicate moving parts, and is therefore very simple and durable—capable of withstanding years of continual use in a busy environment where a high volume of scopes are mounted daily. This tool will hold up well in any type of environment, no matter how rugged the conditions.*

The RETICLE-TRU offers the ultimate in Simplicity, Efficiency, and Versatility.

The RETICLE-TRU alignment device features a “single vertical window to sight and center only the vertical crosswire of the reticle within that opening.” Subsequently, the horizontal crosswire is ignored. Because the tool does not have a horizontal window to sight and center the horizontal crosswire within, a distinct advantage is realized. The device can function in true **simplicity**—without the need for any type of complex adjustable moving parts that would otherwise be needed to mechanically determine the positional height of the rear ocular bell with respect to the device itself. *The Reticle-Tru is designed in such a manner that a wide variety of scopes—whether varied in length, diameter, or design—will readily fit onto the “vee-shaped ocular seat .”* Once positioned on the ocular seat, the ocular bell of the scope is automatically centered with respect to left and right, with no regard for what height the horizontal wire is ultimately positioned at, for that reference is not needed. This arrangement is very **efficient** because in a sense, it is like a “one size shoe fits all”, making the RETICLE-TRU a rather **versatile** gadget.

It is simple and easy to harmlessly attach the RETICLE-TRU to the scope ocular bell. The device is equipped with a machined “relief cut” to accommodate some type of stretchable elastic band such as a rubber band, or a hair-tie that is utilized to temporarily secure the RETICLE-TRU to the scope ocular during the alignment procedure. This arrangement avoids the expensive machining required in order to create movable parts that would grip the differing diameters of various scope ocular bells by means such as spring tension, friction, etc. Now that the RETICLE-TRU is attached to the scope by means of the some type of stretchable elastic band, it is a simple matter to rotate the RETICLE-TRU on the scope ocular while at the same time watching the vertical crosswire in the window or slot, and rotationally adjusting the device until the vertical crosswire is exactly vertical, or perfectly centered within the window, or parallel with either the right or left hand edge of the window.

Once this is accomplished, the installer is ready to place the scope and RETICLE-TRU combination into the bottom halves of the correctly mounted scope rings. The scope is now placed into the ring halves so that the “fore and aft position of the scope” will allow for the proper eye relief—as determined earlier in the mounting sequence before the RETICLE-TRU was affixed to the scope ocular.

Now that the scope and RETICLE-TRU combination is placed into the bottom of the correctly mounted ring halves, the installer is ready to employ the pointers on the device in order to ultimately orient the vertical crosswire of the reticle into a perfectly plumb position on the firearm.

*The RETICLE-TRU device was designed to functionally utilize **two reference pointers in the alignment process**—one pointer on the top, and one pointer on the bottom. By using these two reference points—the **bottom pointer** centered on either the tang (if a rifle), the receiver of the action (if a shotgun), or the frame or backstrap (if a handgun); and, **the top pointer** centered on either the scope tube just behind the turret, the scope turret, the forward bell of the scope, the barrel itself (if the barrel is visible), or the front sight (if the firearm has a front sight)—the installer can more accurately achieve precise alignment of the device—thereby aligning the reticle into a perfectly plumb position on the firearm.*

In order to efficiently perform this mounting and alignment procedure, it is best if the firearm is held securely in either a vise, or a gun rest. **To view the pointers on the RETICLE-TRU, the installer should be directly behind the firearm, and positioned so that the eyes are about 16 to 24 inches behind the RETICLE-TRU in order to establish an accurate line of sight.** From this position, carefully rotate the scope in the bottom of the ring halves—without disturbing the position of the RETICLE-TRU affixed to the scope by means of the stretchable elastic band. *Rotate the scope until you have accurately centered both the bottom and top pointers so that each one is properly indexed “dead center” upon the two specific reference points that you have chosen to use.* After you have determined that both pointers are properly centered on their particular reference indexes that you chose to employ, tighten the ring cap screws to the correct specifications as recommended by the particular manufacturer of the rings you may be using. Remove the RETICLE-TRU device and you are now finished with the alignment procedure. The firearm is now ready to either bore sight with a collimator, or to go out to the range to sight it in.

*The installer can use the RETICLE-TRU alignment device to position the vertical crosswire so that it is perfectly plumb by using one of the following **Three Methods**:*

** **PRIMARY METHOD** ; the installer will use the device by sighting both pointers on the chosen reference points as outlined earlier—this is the preferred way to use the device, the way that it would likely be used most of the time.*

** **SECONDARY METHOD** ; the installer will use the bottom pointer only, and center that pointer on the particular chosen reference point. Though this method may take less time, in my opinion it is not quite as accurate as the primary method, where both top and bottom pointers are used simultaneously.*

** **AUXILIARY METHOD** ; if the mounting base on the firearm—whether a one-piece base, or two-piece bases—has a flat surface that provides the appropriate amount of room on the top of the base, the installer can do the following:*

Place a short, straight ruler or straight-edge that is about 6 inches long across the flat of the base—the installer could also use a short, straight section of a cleaning rod—so that there is an equal amount of the straight-edge protruding out on each side of the mounting base. Position it so that the straight-edge is firmly touching the rear face of the front scope ring. The straight-edge is now squared at 90 degrees to the axis of the firearm. Next, simply rotate the scope and RETICLE-TRU combination, so that the bottom edge of the RETICLE-TRU is exactly parallel with the straight-edge sitting on the base. When it is certain that the straight-edge appears to be perfectly parallel with the bottom edge of the RETICLE-TRU, tighten down the ring caps to the specifications recommended by the manufacturer, and you are finished.

*Though the use of this method may be limited in application by the availability of a suitable flat surface on the mounting base, **the Auxiliary Method can be helpful in certain situations where the scope axis may be off-center with respect to the firearm axis—either due to errors in machining tolerances, or careless installation and adjustment of the rings on their bases during the scope mounting procedure.***

Some notes of explanation regarding the Auxiliary Method:

What is the purpose for using the RETICLE-TRU in conjunction with a straight-edge, rather than simply relying upon centering the built in pointers of the device on the central axis of the firearm?

- *One reason can be very simple—some installers may simply prefer to use it that way.*
- *But there can also be another reason—a scope ocular that is “off-center” with respect to the central axis of the firearm. When this occurs, it becomes difficult to rely upon centering both pointers of the device on the firearm itself to achieve accurate alignment. Why? Because the baseline references of “scope ocular and firearm axis are off-set”, and when this occurs, the pointers of the device will be rendered ineffective, as the device itself is ultimately centered on the ocular bell. When this occurs the installer will be forced to employ the Auxiliary Method. This method functions without using either of the pointers on the device—but rather—the installer will utilize the bottom edge of the device, aligning this edge with a straight-edge on the base.*

Problems can be caused by the final finished contours of the receiver, and also the exact positions of just where the mounting holes for the scope bases may have been drilled and tapped by the factory into the firearm receiver—for in some cases they are indeed slightly off-center. There can also be eccentric tolerances in the machining of the rings and bases. In conjunction with this unfortunate set of circumstances, if the installer just happens to be using non-adjustable rings such as twin dovetails, or detachable cross-slot style rings, the final mounted position of the scope ocular may in fact ultimately end up somewhat slightly off-center with respect to the central axis of the firearm itself.

In addition, “off-set” can also occur in those situations where windage adjustable style rings are used—for if in the unfortunate event that the installer may have unintentionally or carelessly failed to properly align the rings upon their respective mounting base, the ring axis may not be aligned with the center of the firearm axis, thereby causing a potential “off-set” issue.

The result of either of these situations is that the ocular bell of the scope itself may be “somewhat off-center with respect to the central axis of the firearm”. In some situations the amount may be very slight, and is of very little consequence. However, in those situations where the amount is easily and readily discernable, the installer may find that an accurate, acceptable alignment might be easier to achieve by employing the Auxiliary “straight edge method” to align the reticle so that it is positioned perfectly plumb on the firearm.

In most any situation, to be able to employ more than one method or technique to achieve alignment serves to make a particular device far more versatile—a definite advantage for the busy gunsmith, the at home “guncrank”, or retail and wholesale sporting goods stores where a high volume of scopes are mounted on a daily basis.