



# Precision Sighting Level Scope Mounting Ring Style

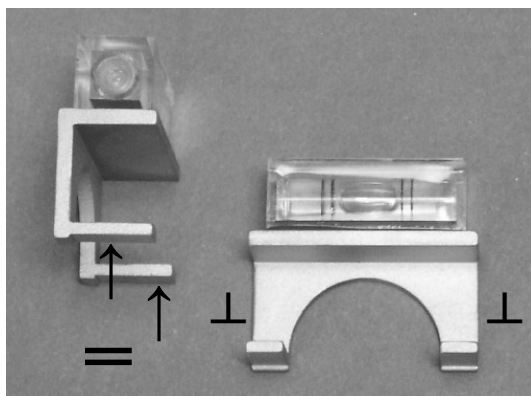
## Mounting Instructions



Your objective is to have the replacement half ring with its level clamping the scope such that the bubble is exactly centered between the two lines when the scope center line is directly above the rifle bore (i.e. exactly on the vertical plane through the rifle bore center line). For the best accuracy and consistency, before this ring style level is tightened permanently down on the scope, the scope should be positioned with its horizontal crosshair exactly horizontal to the earth.

The alignment/level fixture is designed to work with horizontally split scope mounting rings such as Leupold's. It can be used on other types of mounts, but it may be more difficult depending on which surface you find and trust to be truly horizontal or perpendicular to the rifle bore and scope center lines plane.

Note: The alignment/level fixture was assembled with the surface of the step (marked = in this photo) resting on a precise level surface plate. Therefore this surface is the one to have resting on any reference being checked. Either end of the fixture (marked  $\perp$  in the photo) can also be used as they are precisely perpendicular to the spirit level. (Do not use any other surface than those mentioned as they have not been calibrated to be level.)



Replace the top half of the rear scope mounting ring with the new scope ring style level, but do not tighten its screws. Position the alignment/level fixture at the other scope mounting ring. Loosen the screws holding the top half of this ring until the two legs (parallel surface) of the fixture can slip in and rest on the horizontal surface of the lower half as shown below.



Tighten the screws back down only enough to have the top half of the ring keep the fixture in place.

Once the fixture and scope ring style level have been placed as described, it would be best to make sure that the scope is sitting correctly with its crosshairs exactly horizontal/perpendicular. Find a way to hold the rifle steady with the fixture bubble exactly centered and the scope view containing a horizontal reference line that you have placed on a window or wall using tape and a carpenter's level. If the scope horizontal crosshair does not lie parallel to this reference line, loosen the ring style level if required, then rotate the scope until it does.

With the scope accurately oriented in its mount and the rifle still held with the fixture bubble exactly centered, start to snug down the sighting level ring half. If the fixture bubble and the sighting level bubble are both now perfectly centered, and the cross hair is still horizontal, continue tightening its two screws carefully a little at a time. Watch that the sighting level is not rotated as each screw is tightened by making sure its bubble remains centered along with the fixture bubble. Check also to be sure that the scope has not rotated such that its cross-hair is no longer exactly horizontal.



You are now done with the alignment/level fixture so remove it and retighten that scope ring's screws. Please put the level fixture in a safe place for future use and go have fun shooting accurately!

## Notes on how **centered** should the bubble be?

To make comparison calculations easier we will use a vertical distance (bullet drop) of 100 inches. That way it will be a simple matter to divide whatever bullet drop in inches you are interested in by 100, and then multiply this result by the error values given below.

### Alignment/level fixture

For this spirit level, the error in vertical angle when the bubble edge is allowed to just touch one of the first lines instead of being perfectly centered is 8 MOA (MOA = minute of angle =  $1/60$  of a degree). With a vertical distance of 100 inches, this 8 MOA would result in a horizontal error of 0.23 inches. Take your time during the mounting procedure to eliminate this possible error.

### Scope ring mounted level

For this spirit level, the vertical angle error when a bubble edge is directly under one of the lines instead of perfectly centered is 4 MOA. In 100 inches, 4 MOA equals a 0.12 inch horizontal error. When a bubble edge is  $1/32$  of an inch outside one of the lines, the vertical angle error is approximately 27 MOA. In 100 inches, 27 MOA equals a 0.79 inch error.

Thus the scope mounted level is very sensitive. Remember that a vertical angle error of  $2^\circ$ , easy to have when not using a level, produces a horizontal error of 3.5 inches for each 100 inches of drop.



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