

VORTEX®

RAZOR® HD AMG™

EBR-7B MOA Reticle

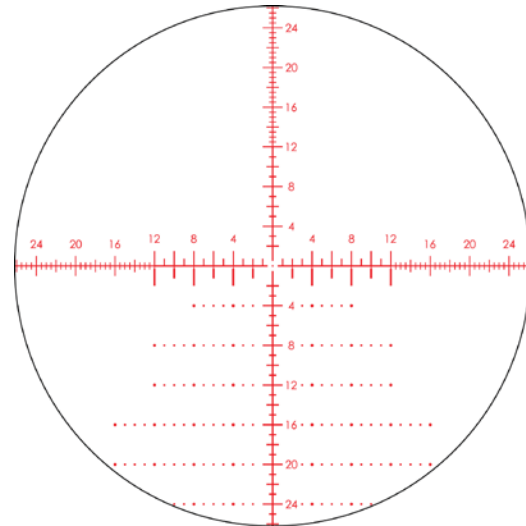




THE VORTEX® EBR-7B MOA RETICLE

Designed to maximize long-distance shooting and ranging abilities, the EBR-7B (Enhanced Battle Reticle) is a hashmarked ranging reticle using MOA based subtension lines for ranging, holdover, and windage corrections.

Ultra-precision laser etching on the glass reticle ensures that MOA specifications are kept to the tightest tolerances possible. The fine center crosshair subtensions on this reticle were carefully designed to provide the optimum balance between precision aiming and low light visibility.

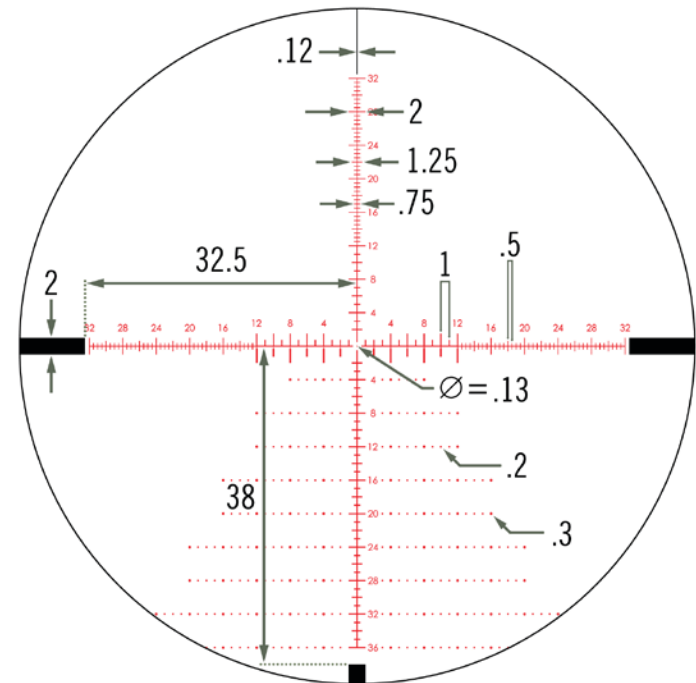


Note: Reticle image shown above is at 24x magnification. Images shown in this manual are for representation only.

MOA SUBTENSIONS

The EBR-7B reticle is based on minute-of-angle (MOA) subtensions. MOA measurements are based on degrees and minutes: 360 degrees in a circle, 60 minutes in a degree for a total of 21,600 minutes. These angular measurements are used to estimate range and correct for bullet trajectory drop in riflescopes. 1 MOA will correspond to 1.05 inches for each 100 yards or 29.1mm for each 100 meters.

In the Razor HD AMG first focal plane riflescopes, the listed MOA subtensions of the EBR-7B reticle are valid at all magnification levels. This means the shooter can use the magnification level most appropriate for the situation and still have effective holdover and windage reference marks. This is also extremely valuable in a high-stress situation, as the shooter does not have to remember to set the scope to one particular magnification to get valid holdovers—an action necessary with the more common second focal plane reticles.



EBR-7B MOA Reticle Subtensions

Estimating MOA

Although 1 MOA is very commonly corresponded to 1 inch at 100 yards, this is not quite correct 1 MOA at 100 yards equals 1.05 inches. Calling 1 MOA an inch per 100 yards may be acceptable at shorter distances, but it will cause a five percent error in ranging and holdover adjustments. This will result in missed shots at longer distances.

RANGING

MOA measurements are very effective for ranging using simple formulas. To use these formulas, the shooter needs to know the size of the target or nearby object in inches or centimeters.

MOA RANGING FORMULA

$$\frac{\text{Target Size (Inches)} \times 95.5}{\text{Measured MOAs}} = \text{Range (Yards)}$$

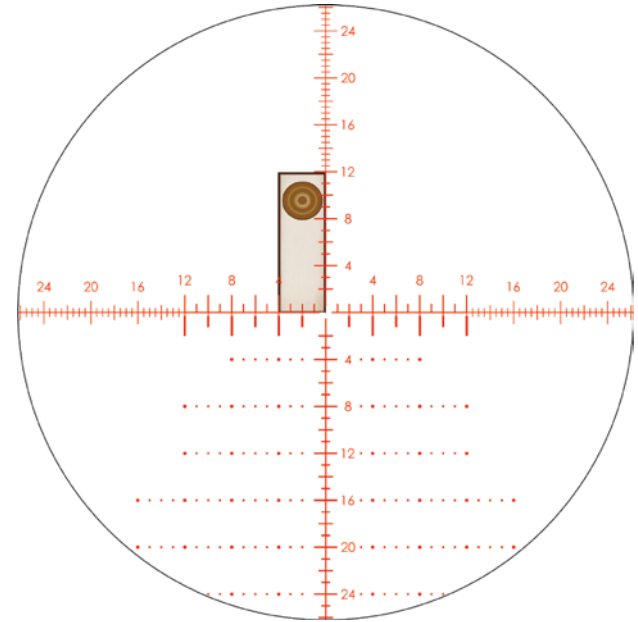
$$\frac{\text{Target Size (cm)} \times 34.37}{\text{Measured MOAs}} = \text{Range (Meters)}$$

Using either the vertical or horizontal MOA scale, place the reticle on a target of known dimensions and read the number of MOAs spanned. You will obtain maximum accuracy in ranging by calculating exact MOA measurements. MOAs should be estimated in 1/4s if possible.

Accurate measuring will depend on a very steady hold. The rifle should be solidly braced using a rest, bipod or sling when measuring. Once you have an accurate MOA reading, use the formula to calculate the distance.

Note: In the yards ranging formula, a shooter may substitute 100 for 95.5 in the interest of speedier calculations. Be aware that this will produce a five percent *over-estimation* error of the yardage distance obtained.

EXAMPLE



Ranging a 6-foot target (72 inches) at 12 MOAs yields 573 yards.

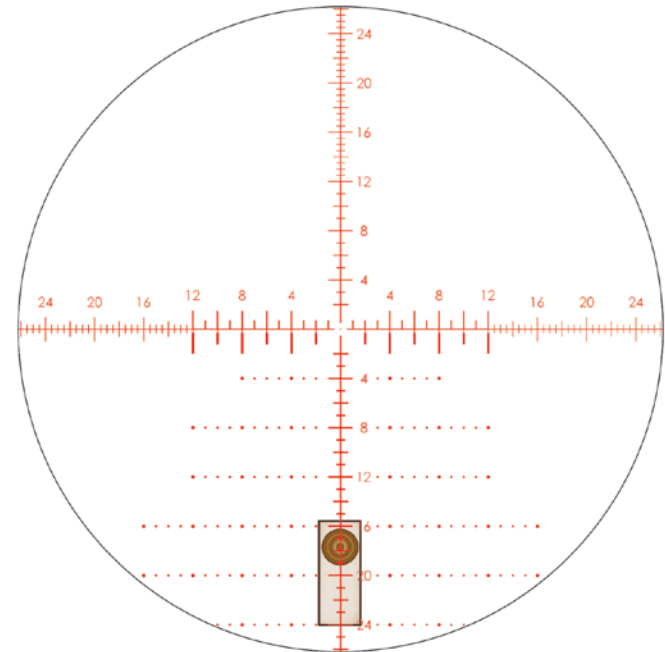
$$\frac{72 \times 95.5}{12 \text{ MOAs}} = 573 \text{ Yards}$$

ELEVATION HOLDOVERS

Once the distance has been calculated using the EBR-7B MOA reticle or a laser rangefinder, the EBR-7B can be used for rapid holdover correction for bullet drop of the cartridge being used. To get the most benefit out of the EBR-7B equipped rifle scope, Vortex® Optics highly recommends shooters learn their bullet drop numbers in MOAs.

Since the EBR-7B reticle is scaled in 1 MOA increments it is an easy job to quickly select the correct drop reference line once the shooter knows their bullet drops and windage/lead corrections in MOAs. If the shooter prefers to dial come ups for bullet drop using the elevation knob, knowing bullet drops in MOAs will allow for much faster adjustments as the MOAs can be quickly read on the elevation knob.

EXAMPLE



17.5 MOA correction for 625-yard shot. No wind.

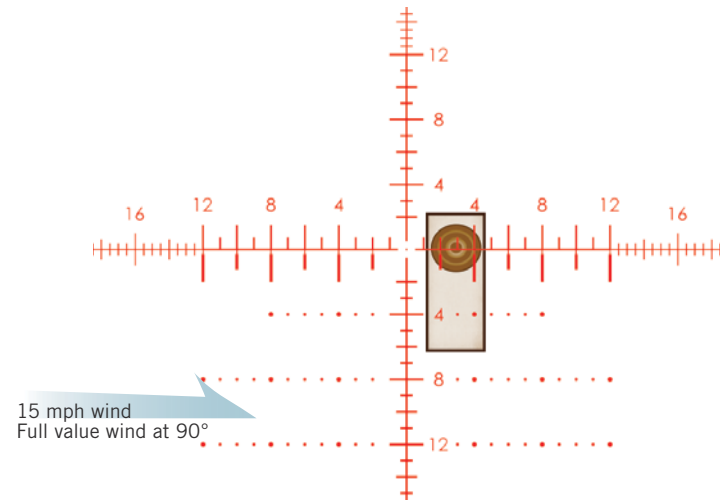
WINDAGE AND MOVING TARGETS

The EBR-7B reticle is highly effective when used for wind and moving target leads. Using the reticle for windage and moving target leads will require thorough knowledge of your weapon system's ballistic performance under varying conditions and experience in reading wind strengths and target speeds. As in bullet drops, it is imperative the shooter learn the particular weapon's windage/moving target corrections in MOAs.

BASIC WINDAGE CORRECTION ON CENTER CROSSHAIR

When dialing elevation come ups, the center horizontal crosshair will be used for windage or moving lead corrections.

EXAMPLE

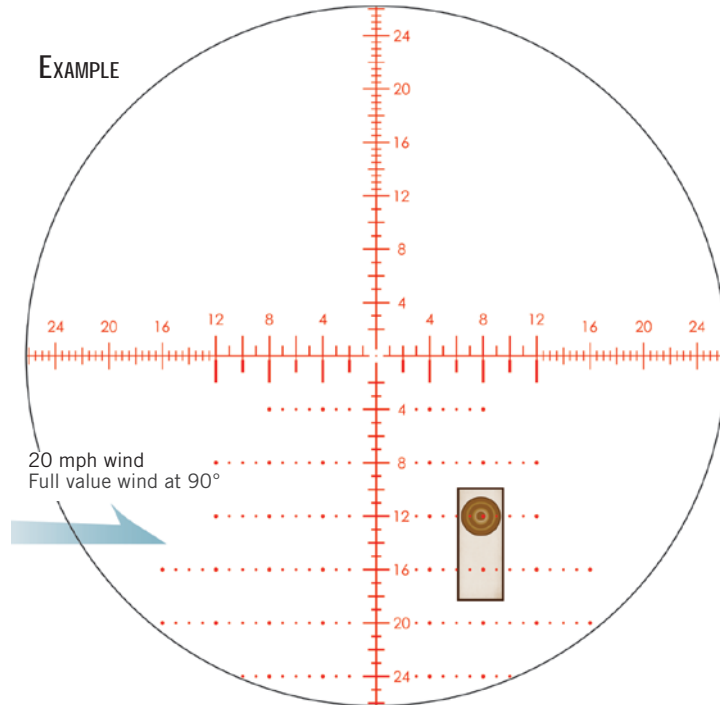


3 MOA correction for 15 mph wind at 700 yards. Elevation already dialed into the turret.

BASIC WINDAGE CORRECTION USING DROP LINE ON RETICLE

When using the reticle for elevation correction rather than dialing, the MOA marks on the center horizontal crosshair can still be used to help visually reference windage corrections.

EXAMPLE



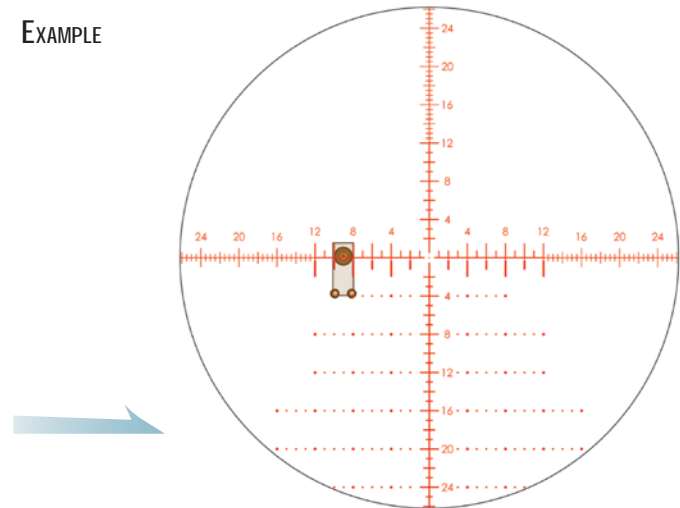
8 MOA reticle windage correction at 500 yards in 20mph crosswind using 12 MOA reticle drop line

BASIC MOVING LEAD CORRECTION

When estimating moving target leads, the MOA marks on the center horizontal crosshair can be used. Estimating moving leads will require knowing yardage distance, wind speed, moving target speed and total bullet flight times including rifle lock time. Bullet flight times can be roughly calculated based on fps velocities or a ballistic calculator.

Note: Correctly estimating moving leads is very difficult and requires considerable practice and knowledge beyond the scope of this manual.

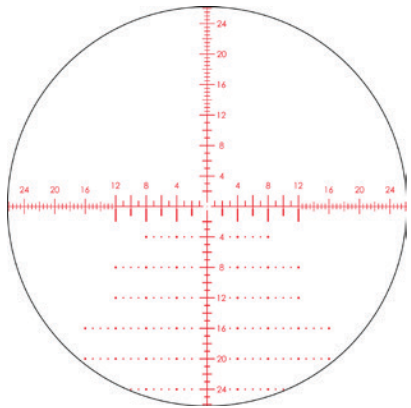
EXAMPLE



9.4 MOA reticle correction for a target moving at 3 mph at 800 yards. No Wind. Total bullet time of flight from trigger pull is 1.5 seconds during which the target travels 6.6 feet. Elevation already dialed into the turret.



EBR-7B MOA
LOW MAGNIFICATION



EBR-7B MOA
HIGH MAGNIFICATION



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