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Rev. 11/18
Part No. 500045-000

SPORT & RECREATIONAL OPTICS

RIFLE SCOPE
INSTRUCTION MANUAL

STOP

PLEASE DO NOT RETURN THIS PRODUCT TO THE STORE!

If you need assistance, replacement parts or have questions regarding the warranty please contact BSA® Optics customer service:

Phone: 954-581-2144
(USA • Monday - Friday 8.30am - 5.00pm CST)
1700 N 2nd St, Rogers, AR 72756

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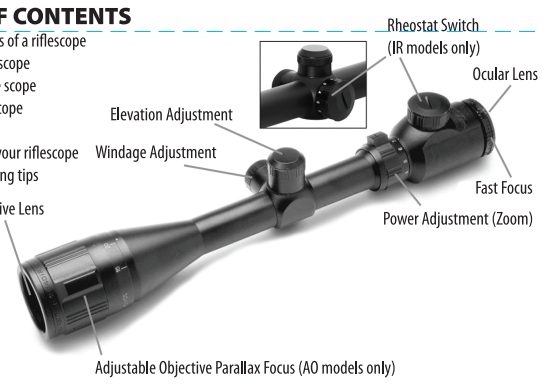


1. FUNDAMENTALS OF A RIFLESCOPE

Five basic elements form the system of a rifle scope:

I. The objective lens performs three important functions:
   (a) It allows light to get inside the scope.
   (b) It creates an image to be magnified by the other optical elements. This image is always upside down.
   (c) It is responsible for the resolution of the scope. The larger the objective lens, the better the resolution becomes.

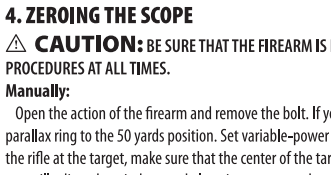
II. The erector system is a small plastic or metal tube with three or four elements or lenses depending on if the optical system is a fixed-magnification or a variable one, and has three functions:
   (a) Primary magnification of the objective image.
   (b) To align the reticle to the image optical axis.
   (c) As its name indicates, it erects or flips the image right-side up.

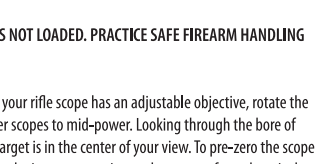
III. Windage and elevation system:
   Since the erector tube is fixed at one end and free at the end closest to the objective lens, the windage and elevation screws serve as supports while providing movement or correction to the reticle to adjust the aiming point to the real point of impact.

IV. Reticle:
   The reticle replaces the iron sight system that usually comes with rifles.

V. Ocular lens:
   This lens does the secondary and final magnification of the image and plays a very important role in the eye relief length.

VI. Parallax.
   The Parallax will manifest itself as apparent movement of the reticle against the target.
   For a scope to be Parallax-free the target must be located at the same distance for which the scope is focused. This means that the target image and the reticle must be focused at the same focal plain.
   Rifle scopes equipped with variable Parallax adjustment allow focusing at different chosen distances.


Objective with adjustable parallax


Side parallax knob

NOTE: The location of the parallax adjustment may vary between models. The adjustment may be located on the objective or in the saddle.

2. FOCUSING THE SCOPE

⚠ **CAUTION:** DIRECT VIEWING OF THE SUN CAN CAUSE PERMANENT EYE DAMAGE. DO NOT ATTEMPT TO VIEW THE SUN WITH EITHER THIS PRODUCT OR THE NAKED EYE.

Standard Focus:

To focus, hold the scope three to four inches from your eye in the direction of a flat surface like a wall or the sky. If the reticle does not appear sharp and well defined, loosen the eye bell lock-ring while looking through the scope and rotate the eyepiece in either direction until perfect focus is obtained. (This may require more than one turn). It is possible that when turning in one direction the focus worsens. To correct this, turn the eyepiece in the opposite direction.

Fast-Focus:

On models with a fast focus ocular system, rotate only the end portion of the eyebell clockwise or counter clockwise to obtain the desired degree of sharpness while looking at a flat, featureless surface. The fast focus works as a macro focus; therefore fewer revolutions are needed to get the desired effect compared with the standard eye bell system.


Standard Focus locking ring


Fast-Focus

3. MOUNTING THE SCOPE

⚠ **CAUTION:** BE SURE THAT THE FIREARM IS NOT LOADED. PRACTICE SAFE FIREARM HANDLING PROCEDURES AT ALL TIMES.

Separate the top and bottom halves of the rings. Install the bottom halves. Set the scope in the cradles formed by the bottom ring halves, position the scope toward the objective lens. Rotate the scope to position the elevation turret on top (at 12 o' clock).

With the firearm in a steady rest position, while looking though the scope slowly pull it close to the eye until the full field of view becomes visible.

Check the orientation of the reticle. The vertical post of the reticle can be aligned with the corner of a wall, a light post, or the vertical axis of the rifle if an optical collimator is not available. Misalignment of the reticle will not affect accuracy at short distances but can become a problem at long distances.

With the scope properly positioned and the reticle aligned with the axes, tighten the top halves of the rings and secure the rings to the base or receiver.

⚠ **CAUTION:** MAKE SURE THAT THE SCOPE IS NOT IN CONTACT WITH THE RIFLE, AND THAT NO SECTION OF IT BLOCKS THE OPERATION OF THE ACTION. AVOID OVER-TIGHTENING THE RINGS. THIS CAN DAMAGE THE SCOPE, AFFECTING PERFORMANCE OR RENDERING IT INOPERABLE. THERE SHOULD BE A SLIGHT, EVEN GAP ON THE LEFT AND RIGHT SIDES OF BOTH SETS OF RINGS, BETWEEN THE TOP AND BOTTOM HALVES.

4. ZEROING THE SCOPE

⚠ **CAUTION:** BE SURE THAT THE FIREARM IS NOT LOADED. PRACTICE SAFE FIREARM HANDLING PROCEDURES AT ALL TIMES.

Manually:

Open the action of the firearm and remove the bolt. If your rifle scope has an adjustable objective, rotate the parallax ring to the 50 yards position. Set variable-power scopes to mid-power. Looking through the bore of the rifle at the target, make sure that the center of the target is in the center of your view. To pre-zero the scope you will adjust the windage and elevation screws so that the image appearing at the center of your bore is the same centered in the riflescope reticle.

If your firearm is not a bolt action, we recommend the use of an optical collimator. Make sure to follow the collimator instructions and the safety rules.

If a considerable amount of adjustment is required to align the reticle and you have adjustable rings or mounts, make the larger adjustments using these devices and the micro adjustments with the windage and elevation turrets of the scope.

If you do not have the above mentioned mounting systems, make approximately one-half of the required windage correction, then approximately one-half of the required elevation correction. Finish by applying the balance of windage and elevation correction. Making large adjustments in small increments will prevent damage to the scope's spring.

⚠ **CAUTION:** ALL DISCHARGING OF FIREARMS SHOULD BE DONE AT AN APPROVED RANGE OR EQUALLY SAFE AREA. THE USE OF EYE AND EAR PROTECTION IS RECOMMENDED.

⚠ **DANGER:** IF A BORE SIGHTING COLLIMATOR OR ANY OTHER BORE OBSTRUCTING DEVICE WAS USED, IT MUST BE REMOVED BEFORE PROCEEDING. AN OBSTRUCTION CAN CAUSE SERIOUS DAMAGE TO THE GUN AND POSSIBLE INJURY TO YOURSELF AND OTHERS NEARBY.

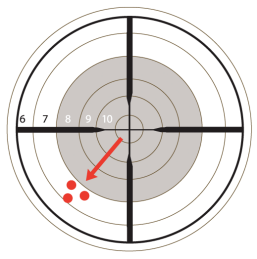
Set the scale on the parallax adjustable models to the 100 yard position. Set variable-power scopes to highest power. From a steady rest position, fire three rounds at a target 100 yards away. Observe point of impact on the target and adjust windage and elevation screws as needed to correct aim. Repeat if necessary.

Note: Each click of adjustment changes bullet strike at a shooting distance of 100 yards by the amount indicated on the windage and elevation turrets.

To calculate the click value at distances other than 100 yards, use the following formula: divide the distance (number of yards) by 100. The resulting number, when multiplied by the click value stated on the windage and elevation dial plates, will yield the actual click value of the scope at the shooting distance.

Distance / 100 = N

N x stated click value = actual click value

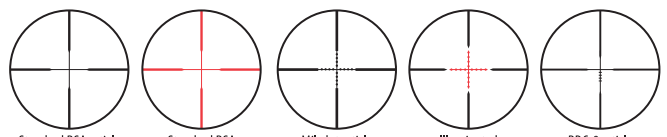


To place the center of the reticle on the point of impact, turn the elevation turret counterclockwise to raise the point of impact. Then, turn the windage turret clockwise to move the point of impact to the left.

Once zeroing of the weapon is complete, replace the windage and elevation caps if necessary.

5. RETICLE

BSA® rifle scopes have different reticle designs according to the scope application.


Standard BSA reticle | Standard BSA illuminated reticle | Mil-dot reticle | Illuminated mil-dot reticle | BDC-8 reticle

Mil-dot Reticle

The Mil-dot reticle is based on a heavy artillery ranging principle. The main purpose of the reticle was to give a better tool to the Marine snipers to range distances. After almost a quarter of a century, it is the standard reticle in all branches of the military.

What is a Mil-dot?

Mil-dot stands for Mil-radian. A Mil is one of the ways an angle can be measured. It is equal to 1/6400th of a circle, and measures 3.6 inches at 100 yards, or 36 inches at 1000 yards. For long distance shooting, one Mil equals one yard at 1000 yards.

One Mil in the reticle is the distance from the center of one dot to the center of the next. Contrary to popular belief, the Mil-Dots on the reticle measure .75 Mil instead of one Mil. The following table shows width equivalents at different distances between the Mil and the MOA.

To use the Mil-dot range finding capabilities you must know the size of the target. The formula used to calculate range to the target is: (Size of targets in yards X 1000 divided by the numbers of mils the target covers in the reticle). To obtain the size in yards divide the target height in inches by 36 inches.

$$\frac{\textit{Target Height X 1000}}{\textit{Height of target in Mils}} = \textit{Range in yards}$$

Example:

The known height of a target is 24 inches and covers 1.5 mils in the reticle. Divide 24 into 36" to obtain the correct size in yards.

$$\textit{24/36 = .66 yards} \quad \frac{\textit{.66 X 1000}}{\textit{1.5 mils}} = \frac{660}{1.5} = \textit{440 yards}$$

Distance In Yards	One Mil Width in inches	One MOA width in inches
1000	36	10
900	32.4	9
800	28.8	8
700	25.2	7
600	21.6	6
500	18	5
400	14.4	4
300	10.8	3
200	7.2	2
100	3.6	1

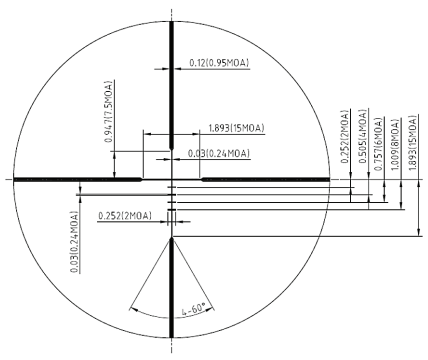
Windage and elevation. The table on the right shows the click values of the Mil-dot reticle and their equivalent in MOA at different distances.

Distance in Yards	One Mil Width in inches	Click Value in Mils	One MOA width in inches	Click Value in MOA
1000	36.00	4.50	10.00	1.25
900	32.40	4.05	9.00	1.13
800	28.80	3.60	8.00	1.00
700	25.20	3.15	7.00	0.88
600	21.60	2.70	6.00	0.75
500	18.00	2.25	5.00	0.63
400	14.40	1.80	4.00	0.50
300	10.80	1.35	3.00	0.38
200	7.20	0.90	2.00	0.25
100	3.60	0.45	1.00	0.13

BSA BDC-8 Reticle

The BDC-8 reticle simplifies target acquisition with clear hash marks located at 2 MOA, 4 MOA, 6 MOA and 8 MOA holdover positions. Unlike many bullet drop compensating reticles, the BDC-8 can be used effectively with any cartridge. To use, zero your rifle with the magnification set at 9X. At that magnification, the hash marks will be at exactly 2, 4, 6, and 8 MOA. The below chart contains the distance each hash mark corresponds to for several of the most popular cartridges.

Note: Due to different barrel lengths, different bullet styles, loads and environmental factors, your cartridge may not be an exact match to the BDC-8 reticle. All aiming points should be verified by shooting at an appropriate range.



BSA BDC-8 Reticle Trajectory Chart

Cartridge	Gr.	2 MOA	4 MOA	6 MOA	8 MOA
		Distance In Yards			
22-250 Remington	50	280	382	463	531
25/06 Remington	117	225	311	386	453
270 Winchester	130	249	348	435	514
280 Remington	139	238	333	416	492
7mm Remington Magnum	139	250	351	439	520
300 Weatherby Magnum	180	239	333	415	489
204 Ruger	40	298	409	499	575
223 Remington	55	235	318	387	446
243 Winchester	100	224	309	383	450
7-08 Remington	139	223	309	386	456
30-30 Winchester	150	162	207	245	279
308 Winchester	150	222	307	381	448
30-06 Springfield	150	235	327	406	478
30-06 Springfield	165	224	310	386	455
300 Winchester Magnum	180	226	314	391	461
338 Winchester Magnum	225	217	302	376	445
6.5 Creedmoor	120	235	326	407	480
6.5 Creedmoor	129	226	315	393	465

Windage and Elevation Turret Knob Settings

Most BSA® target scopes have removable windage and elevation turret knobs that can be re-set to zero once the rifle has been sighted in. This feature allows the shooter to calculate how many "clicks" of adjustment are necessary from the zero setting when shooting at different distances or wind conditions, then quickly and accurately return to their original setting. The knobs can be re-set as follows:

Loosen the three small screws (around the top of the knob) holding the knob to the internal post. Then reposition the loosened turret drum to your zero at your desired distance on the "0" indicator line of the turret drum. At 100 yards it takes 4 clicks to move the point of impact approximately 1 inch or 1 moa (they aren't exactly the same thing but close enough). MOA is a minute of angle on a compass. A minute is 1/60th of one degree. A scope that comes equipped with 1/8 MOA adjustments takes 8 clicks to move 1 inch at 100 yards.

They make it that way so that at 1000 yards you still have some useable resolution. At 1000 yards the 1/4 MOA scope changes point of impact from point of aim 2.5 inches for every click, 4 clicks is no longer 1 inch but 10 inches. The 1/8 MOA scope only changes point of impact from point of aim 1.25 inches for every click, 4 clicks would only be 5 inches and it takes eight clicks to move 10 inches.

Precise adjustment helps to dial out windage at these long ranges if you know what the wind velocity is and your rifle's ballistics. Simply crank the windage dial enough clicks to be on target.

Scopes with Illuminated Reticles

The battery switch housing is set on top of the eyebell in alignment with the elevation turret. BSA® offers a standard 11 position rheostat. It uses a lithium CR2032 3V. battery. The battery is protected against accidental discharge during shipping by a plastic bag.

On scopes with settings from 1 to 11, use setting 1 through 3 for lowest light conditions, 4 through 6 for dusk and dawn, 7 through 9 for over cast or cloudy days and 10 through 11 for bright sunny days. Individual scopes may vary and light conditions will change so for best performance always set the dot at the lowest setting that it can clearly be seen. If the dot appears to have a halo or be out of focus the brightness setting should be reduced until it is clear and sharp.

With settings from 1 to 3, use setting 1 at lowest light, 2 cloudy or overcast and 3 for brightest conditions. On scopes with Red, Green and Blue dots use the color that shows up the best against the background you are looking at and set the brightness to match the light conditions.

Remove the battery compartment cap by turning it counter-clockwise. Insert the battery with the positive (+) side facing up. Replace the cap by turning it clockwise and tighten to avoid moisture or water from getting inside.

The illuminated feature is activated by turning the rheostat switch to number 1. Each click will increase the instensity, 11 being the maximum. To turn off the illuminated reticle turn the knob to the zero position.

6. MAINTAINING YOUR RIFLESCOPE

Do not attempt to disassemble or clean the scope internally. This will void the warranty. If the scope requires repairs or adjustment, complete instructions can be found in the warranty.

The external optical surfaces should occasionally be wiped clean with the lens cloth provided, a soft lint-free cloth, or an optical quality lens paper. Keep the protective lens covers in place when the scope is not in use. Remove any external dirt or sand with a soft brush to avoid scratching the finish. Wipe the scope with a damp cloth, following with a dry cloth. Store the unit in a moisture-free environment.

7. TROUBLE SHOOTING TIPS

Inaccuracy Issues

1. First check your mount. Using your bare hands only, softly twist the scope in the rings, checking for any movement. If there is any movement, re-tighten the mounts. Non-permanent thread loctite is recommended.
2. Use a bench rest or sandbag to support the forearm and butt stock when making windage and elevation adjustments. This will help eliminate movement.
3. Always follow through with every shot.
4. Always use ammunition of the same bullet type and weight.
5. Check that your rifle is properly bedded in the stock. A loose stock can create changes to the point of impact.
6. Check that your barrel and chamber are clean. Damaged rifling or excessive grease can cause inaccuracy.
7. Always make adjustments in small increments to avoid moving the erector tube.

For questions on our products and for complete instructions on warranty and repair, contact BSA® Optics customer service at (954) 581-2144 or visit www.bsaoptics.com

For returning products

Return products following the warranty guidelines.

A brief description is included below.

1. Remove any accessories and rings
2. Include a note with a brief description of the problem, address, telephone number, and email address
3. A $10 check for return shipping and processing fees and proof of purchase.
4. We recommend using a shipping method with a tracking number (FedEx,UPS ect.). BSA® optics cannot be held liable for lost or damaged items.

*Please note if your product is not registered you must have proof of original purchase, or you will be subject to repair fees.(see warranty)

ONE (1) YEAR LIMITED WARRANTY

BSA® warrants this product to be free of original defects in material and workmanship for a period of one year. This warranty is not transferable and as such is limited to the original purchaser. This warranty applies only to goods purchased in the United States and Canada. BSA® will replace this product without charge for parts and labor contingent upon an inspection by BSA® that the product does not indicate a defect caused by tampering or disassembly, or any other warranty exclusion as listed within this returns policy.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. AS DEFINED BY FEDERAL LAW, THIS IS A LIMITED WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS OF IMPLIED WARRANTY, SO THIS LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, ANY SUCH IMPLIED WARRANTY IS LIMITED TO THAT REQUIRED BY LAW. BSA® SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS OR OTHER ECONOMIC OR COMMERCIAL LOSSES. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. BSA® MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS (FOR A PARTICULAR PURPOSE). THE SOLE REMEDY PROVIDED IN THIS WARRANTY IS REPLACEMENT OF THE PRODUCT.

For Warranty

Product should be returned postage prepaid to the address provided in the general returns policy.

Charges For Out Of Warranty

If your product needs replacement, call Customer Service at (954) 581-2144 for replacement charge. We accept Visa and Mastercard. When paying by check or money order, please send with product. Attach to the product your name, street address (Not Post Office Boxes) and description of the problem. Package and send to BSA® Optics Service Center. Standard $10.00 shipping and handling fee will apply for return shipping.

General Returns Policy

All refunds are subject to condition of merchandise received by BSA®, and must comply with the return policy.

All Returns:

Shipping and Handling Fees: Consumer is responsible for all shipping fees to BSA®, Inc., as well as all return shipping fees after replacement. All shipping fees are nonrefundable.

Restocking Fees:

Items that are used, not in original packaging or otherwise not in new, sellable condition are subject to a minimum fifteen percent (15%) restocking fee.

DO NOT ATTEMPT TO DISASSEMBLE ANY ITEMS. ATTEMPTS TO CHANGE THE FUNCTION OR APPEARANCE OF ANY ITEM YOU PURCHASED FROM US WILL VOID THE WARRANTY AND YOUR RIGHT TO RETURN THE PRODUCT FOR A FULL REFUND.

ALL EXCHANGES WILL BE PROCESSED WITHIN TWO WEEKS FROM DATE OF RECEIPT OF PRODUCT AT OUR SERVICE CENTER.

Return Conditions:

All returns must include with the product:

- Your proof of purchase/receipt with the product, the reason for your return, and your phone number on the back of that invoice.
- A clearly written note explaining the nature of the problem, including your name, address, and telephone number.
- A check or money order in the amount of $10.00 to BSA® for return shipping and handling on all items.

Shipping Damage and Lost Packages:

- If an item arrives damaged as a result of shipping, we will be happy to exchange it for you. An insurance claim must be filed and has to be finalized before compensation is issued to the customer or product is replaced.
- Notify BSA® within 3 days of receipt for any damaged or missing merchandise to initiate a claim.
- DO NOT discard any packaging or paperwork to facilitate the investigation process if necessary.

Warranty and Non-Warranty:

- All lasers, red dot sights, scopes with electronic reticles or lasers, and pistol scopes carry a one (1) year limited warranty.
- Warranty includes parts and replacement of any factory defect of material or workmanship. A copy of your original sales receipt is required unless your warranty information has been registered. (If you are unable to provide a purchase receipt, standard replacement fees will apply)
- A check or money order to BSA® in the amount of $10.00 is required for return shipping and handling on all items.
- Include with your product a detailed letter explaining the nature of the problem. Be sure to indicate your name, address, and telephone number. Allow six (6) weeks.
- In the event of a non-warranty replacement, you will receive an estimate prior to replacement. It is the customers' responsibility to ensure the safe return of any goods. We recommend you use a method of shipping that provides you with a tracking number and insurance options.

BSA® IS NOT LIABLE FOR ANY DAMAGED, LOST OR STOLEN MERCHANDISE DURING SHIPPING.

WARRANTY EXCLUSIONS:

WARRANTY ONLY APPLIES TO DEFECTS THAT OCCUR WITHIN NORMAL USE OF THE PRODUCT.

WARRANTY SPECIFICALLY EXCLUDES PRODUCTS UNDER THE FOLLOWING CONDITIONS:

- Used in a manner other than specified in the operations manual.
- Not properly maintained in compliance with handling instructions.
- Misused, neglected, or tampered.
- Altered or repaired, or evidence of attempt of alterations or repairs.

WARRANTY SPECIFICALLY EXCLUDES THE FOLLOWING AREAS OF PRODUCTS:

- WINDAGE AND ELEVATION CAPS
- LENS COVERS AND SUNSHADES
- MAINTENANCE AND CLEANING SUPPLIES

Should BSA® choose to replace the product, and the product is no longer available at the time warranty service is required, a substitution of similar performance and equal value will be made.

To return a BSA® Optics product for replacement, or refund, ship to:
BSA® Optics Service Center, 1700 N. 2nd St., Rogers, AR 72756

SPORT & RECREATIONAL OPTICS

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