

# PROFESSIONAL SCOPE MOUNTING KITS

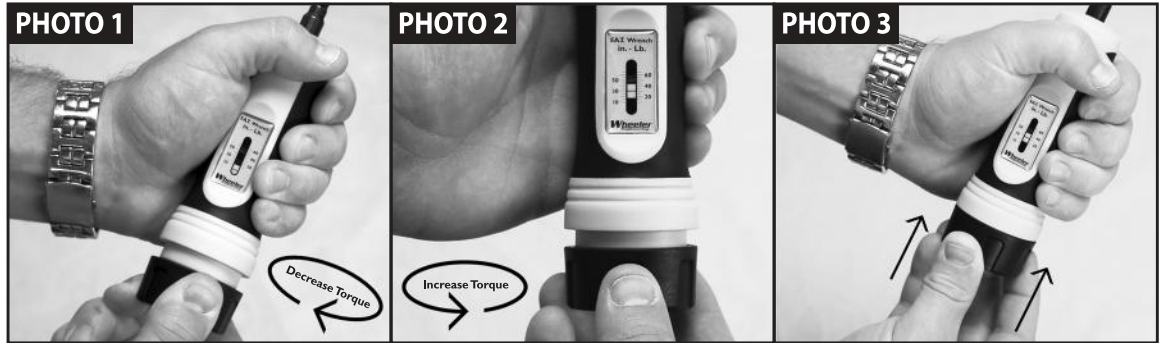
The Wheeler Professional Scope Mounting Kits include everything you will need to properly mount a scope. An instructional DVD outlining step by step instruction has been included with your kit. These printed instructions can be referenced for additional detail on each of the key components of the kit.



FIREARM ACCURIZING TORQUE WRENCH

## USER INSTRUCTIONS

Instruction #1009310



The Wheeler Engineering F.A.T. Wrench is a hand driven, click/clutch style torque wrench that is very useful for applying the necessary torque to most firearm and firearm accessory fasteners. The F.A.T. Wrench features a thick ergonomic handle, a standard 1/4" hex drive tip, and can be used to apply torque from 10 to 65 in-lbs at 5 in-lb increments. Common uses include, but are not limited to; installation of scope ring and base screws, action screws and trigger guard screws. With proper care and use, the F.A.T. Wrench will provide you with a lifetime of reliable service. Package includes 9 bits and a square drive adapter.

### TO ADJUST THE F.A.T. WRENCH, PLEASE FOLLOW THESE STEPS TO GUARANTEE THE MOST ACCURATE TORQUE SETTINGS:

1. Begin with the F.A.T. Wrench adjusted to the lowest torque setting. To do this, grasp the body of the F.A.T. Wrench as shown in PHOTO 1. Using your other hand, grasp the black knob at the bottom end of the handle. Pull the knob away from the handle to unlock it, and turn it counter-clockwise. The knob is spring loaded and will return to the locked position when it is released, preventing it from being turned. You must repeatedly pull the knob and turn it counter-clockwise until it comes to a stop. The red mark on the sliding indicator should be visible at the bottom of the scale below the 10 tic mark, as shown in PHOTO 1. This is also the where the F.A.T. Wrench should be adjusted when it is not in use.
2. Using the same technique described in Step 1 to adjust the wrench, pull and turn the knob clockwise until the red mark on the sliding indicator is aligned with the desired tic mark on the scale. This can be seen in PHOTO 2, where the F.A.T. Wrench is adjusted to 30 in-lbs.
3. When the F.A.T. Wrench is adjusted to the desired torque setting, make sure the knob has returned to the locked position. This may require turning the knob slightly one way or the other and pressing it back into the locked position. See PHOTO 3.
4. Insert the bit needed into the hex drive tip. The F.A.T. Wrench can now be used to apply torque to the fastener.
5. Tighten the fastener by turning the F.A.T. Wrench clockwise. As the fastener begins to get tight, turn the F.A.T. Wrench SLOWLY until you hear an audible click. Turn it two more for a total of 3 clicks. The fastener has now been tightened with the torque specified on scale.
6. After use, return the F.A.T. Wrench to the lowest torque setting as described in Step 1.

**Note: When using the F.A.T. Wrench to torque small fasteners, make sure the bit and the head of the fastener are correctly aligned. Correct alignment will prevent damage to both the bit and fastener.**

### A FEW USEFUL TIPS:

- The F.A.T. Wrench is used like a screwdriver; it is not a ratcheting device.
- Never leave the F.A.T. Wrench adjusted at high torque settings for extended periods of time. Doing so will damage the internal mechanism, resulting in inaccurate torque adjustment. **ALWAYS ADJUST THE F.A.T. WRENCH TO THE LOWEST TORQUE SETTING AFTER USE.**
- Never adjust the F.A.T. Wrench beyond a torque setting of 65 in-lbs. Doing so will damage the internal mechanism, resulting in inaccurate torque adjustment.
- The F.A.T. Wrench is compatible with all of the bits contained in the Wheeler Engineering 89 Piece Screwdriver Set.
- The F.A.T. Wrench was designed for +/- 2 in-lbs accuracy up to 40 in-lbs, +/- 5% over 40 in-lbs.
- The F.A.T. Wrench can be used to apply torque to any fasteners; it is not limited to firearms and firearm accessories.
- Small, inexpensive screws can be damaged with high torque settings. Be sure to comply with recommended settings.
- Small bits can also be easily damaged with high torque settings. Replacement bits are available from many of our dealers and through our website.

### RECOMMENDED TORQUE SETTINGS:

#### F.A.T. Wrench Torque Range is 5 to 65 inch-pounds

Before applying torque to any fastener, consider whether the fastener is lubricated or dry/degreased. Lubricated fasteners require much less torque to achieve consistent clamping power compared to dry un-lubricated fasteners. Keep in mind that most fasteners used for installing gun accessories are coated with oil to prevent corrosion. This oil as well as removable thread-locking compounds that are often applied to screw threads should be considered as lubricant.

**NOTE: The values tabulated below are for high grade (SAE Grade 8 or equivalent) steel fasteners. If you are unsure about the size or quality of the fastener you are installing, start with a lower torque value and only increase to the maximum torques listed if you feel comfortable doing so. Bits are considered "use" items and are not warranted against bending or breakage.**

Nominal Screw Sizes	Common Uses For These Screws	Screw Diameter at Threads (in)	Lubricated Fastener Torque (in.-lbs.)
6-32 UNC 6-40 UNF 6-48 FINE	Commonly used on scope base mounts	0.131" - 0.138"	18 - 20
8-32 UNC 8-36 UNF 8-40 FINE	Commonly used on scope rings	0.157" - 0.164"	28 - 30
10-24 UNC 10-32 UNF	Commonly used on scope base windage screws	0.184" - 0.190"	40 - 45

### Limited Warranty

Every Wheeler Engineering product is warranted to be free of defects in materials and workmanship for a period of one (1) year from the date of original purchase. Wheeler will, at its option, repair or replace without charge, except for transportation costs, parts that fail under normal use and service when operated and maintained in accordance with our instructions. This warranty does not apply to normal wear or to items whose life is dependent upon their use and care. This warranty is in lieu of all other warranties, expressed or implied and releases Wheeler Engineering, its affiliates, and its vendors from all other obligations and liabilities.

# Level-Level-Level USER INSTRUCTIONS

The alignment of a rifle scope's crosshairs relative to the axis of the bore is very important, especially at long range.

The **Level-Level-Level** works by aligning a scope's horizontal plane with a horizontal plane on the rifle's receiver. Manufacturing processes of scopes and rifles offer accessible horizontal platforms for alignment.

## There are two respects of scope alignment:

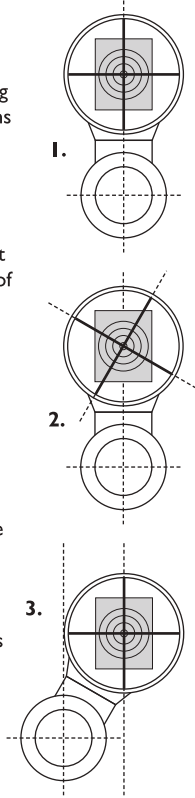
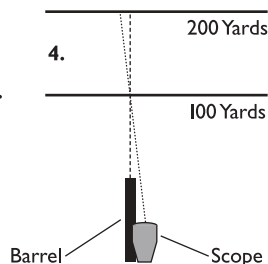
1. Alignment of the scope to the rifle.
  2. Alignment of the crosshairs as controlled by the shooter.
- An aligned scope reticle has its vertical portion positioned so that if it were extended downward, it would pass through the center of the bore. **See Photo 1.**

If a scope is misaligned and you attempt to adjust the windage or elevation, the reticle will not track vertically or horizontally with respect to the bore. **See Photos 2.** In this instance, adjusting elevation upwards will also move the point of impact to the right. This is frustrating and wasteful during sight-in.

If a scope is misaligned clockwise and you hold the rifle such that the horizontal reticle is level, the rifle can only be perfectly sighted in at one distance. **See Photos 3 and 4.** In this instance where the rifle is sighted in for 100 yards, the bullet will impact left of the point of aim for any distance beyond 100 yards and right of the point of aim for any distance less than 100 yards.

If a shooter is given a zeroed rifle with an aligned scope, but cants the rifle to the right, a shot at a range beyond the sight-in distance will strike to the right and likely low, depending on the cartridge trajectory and range.

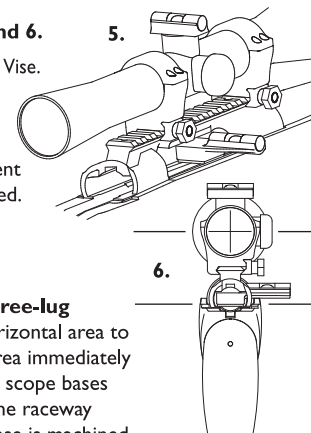
**NOTE: It is imperative that every attempt possible is made to ensure the scope crosshairs are properly maintained in horizontal and vertical alignment while shooting. Proper alignment will ensure the scope reticle tracks vertically and horizontally correctly while making adjustments for elevation and windage.**



# HOW TO USE THE LEVEL-LEVEL-LEVEL

For most bolt-action rifles: See Photos 5 and 6.

1. Secure rifle in a padded vise, such as the Tipton Gun Vise. Place magnetic base of Action Level across receiver rails and maneuver rifle until bubble is centered.
2. Loosen scope rings and remove turret cover.
3. Place scope level across the elevation adjustment screw and rotate the scope until bubble is centered.
4. Tighten scope rings.
5. Crosshairs are now perfectly level for ultimate accuracy at any distance.

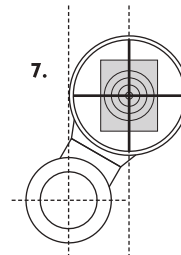


**Bolt-action rifles with small receivers, or three-lug systems like the Cooper:** Locate another horizontal area to attach the receiver level. The Cooper offers an area immediately behind the rear receiver bridge. (You can use the scope bases although they are not necessarily as accurate as the raceway rails.) AR15 style rifles - On flattops the scope base is machined as part of the receiver; so use it as a platform. The magnetic base of the level does not adhere to the aluminum, but it can be held in place with finger pressure or a rubber band. Carry handle versions offer no surfaces on the upper receiver. The bottom surface that meets with the lower receiver is machined. Position the level crossways on the underside of the receiver using imaginative attachment procedures, such as rubber bands or finger pressure.

**Lever-action rifles with offset scopes, M1, and M1A:** M1 and M1A's have flats behind the rear sight. The level can be attached across the top edges of the receiver on the Winchester M94. Other applications may require imaginative treatment. **See Photo 7.**

**Autoloading and pump rifles and slug-shooting shotguns with flat sides:** These firearms seldom have a horizontal plane available for attachment of the level, unless you remove the trigger assembly and bridge the underside of the receiver. An unusual, but practical approach is to secure the firearm on its left side, attach the receiver level to the right side of the receiver, level it, and place the scope on level of the windage (side) turret.

**Troubleshooting:** If you have been shooting for any length of time with unlevel crosshairs before using the Level-Level-Level, you may find it disconcerting when you shoulder your firearm and the crosshairs appear skewed. This is normal. You may have been consciously or unconsciously canting your rifle to align the crosshairs horizontally. The Level-Level-Level works and if used correctly, can be trusted to align your crosshairs perfectly. You may have to unlearn your bad habits to get used to shooting a scope with level crosshairs.



# Scope Ring Alignment & Lapping Kit USER INSTRUCTIONS

Dimensional variances in scope bases, rings, and firearm receivers combine to cause scope rings to be misaligned. There are two reasons for aligning your scope rings:

1. Misaligned rings cause stress on the scope tube, which can dent the tube, distort the reticle, and cause adjustment problems.
2. Properly aligned rings create more surface contact with the scope tube to keep scopes in place during heavy recoil.

## USING THE SCOPE ALIGNMENT KIT

**Warning:** Be sure firearm is unloaded before performing any gunsmithing or maintenance.

1. Clamp firearm in a vise with padded jaws. We recommend the use of the Tipton Gun Vise™ to hold the firearm securely and safely.
2. Follow manufacturer's instructions for mounting bases and rings. **NOTE: Scope manufacturers specifically say not to use the scope tube for mounting dovetail rings because of the risk of bending the tube and voiding the warranty. The Lapping Shaft may be used to install dovetail rings.**
3. Check initial alignment after the base and rings have been mounted.
  - a. Remove top half of both rings. Keep ring pairs together and do not reverse top halves on their bottom halves. Most rings are manufactured as a single piece before they are split. Note: It is a good idea to mark the rings so you don't mix or reverse them.
  - b. Lay an Alignment Bar in each of the ring bottoms, pointed ends facing, just short of making contact. Adjust them so the pointed ends are approximately midway between the rings. **See Photo 1.**
  - c. Replace ring top halves. Tighten ring screws as if scope were being secured.
  - d. If the scope rings are aligned, the points of the Alignment Bars will be aligned both horizontally and vertically.
  - e. If the points are not in alignment:
    - I. Check that ring top halves are not switched / reversed.

2. Slightly rotate dovetail mount rings (if equipped) to improve windage alignment.
3. Adjust rear ring windage screws (if equipped).
4. Two-piece bases may need to be shimmed to improve elevation alignment.
5. Align the rings as closely as possible before lapping; lapping will remove minor alignment issues.

4. Lapping the scope rings.
  - a. Loosen the rings enough to remove alignment bars.
  - b. Apply lapping compound to the inside of both halves of the rings. **See Photo 2.**
  - c. Slide the lapping bar through both sets of rings.
  - d. Tighten rings just enough to apply pressure to the rings but still allow the lapping bar to slide.
  - e. Thread handle into hole on lapping bar. **See Photo 3.**

**NOTE: Two threaded holes are provided in the lapping bar for the handle. For most applications, mounting the handle in the center of the lapping bar will provide the most control and ease of use while lapping. For mounting systems with closely spaced rings, it may be more convenient to mount the handle at the end of the bar.**

  - f. Begin lapping the scope rings by rotating the lapping bar side to side and sliding it back and forth. Rings may need to be gradually tightened as you remove material.
  - g. Periodically check your progress. Remove the lapping bar, clean any lapping compound from the rings, and reinstall the alignment bars. Make sure you don't remove so much material that the rings will no longer tighten onto the scope.
  - h. Repeat until alignment bars match. **See Photo 4.**
  - i. Clean scope rings to remove all grit. Do not remove bases or rings or you will have to realign and/or re-lap.
  - j. Mount scope according to manufacturer's instructions.

