

Fig. 1

## Hypertap® Muzzle Brake Instruction Manual

**WARNING!** FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS BEFORE INSTALLATION AND/OR USE CAN RESULT IN PROPERTY DAMAGE, SEVERE INJURY OR DEATH.

**WARNING!** MAKE SURE FIREARM IS UNLOADED BEFORE INSTALLATION, REMOVAL, OR MAINTENANCE. VISUALLY INSPECT CHAMBER, MAGAZINE, AND FIRING MECHANISM TO BE CERTAIN NO AMMUNITION IS IN THE FIREARM. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.

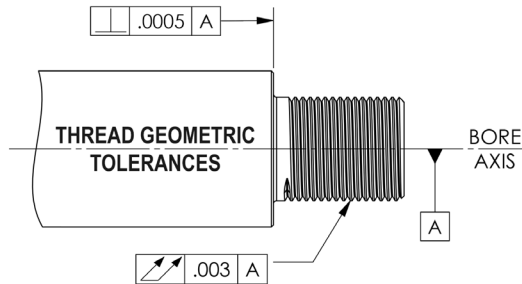


Fig. 2

**IMPORTANT:** Fig. 2 outlines barrel thread geometric tolerances required for installation, most factory barrel threads should satisfy these requirements. For thread specifications and dimensions please visit: [www.precisionarmament.com/manuals](http://www.precisionarmament.com/manuals)

**INSTALLATION:** Prior to installation be sure threads are completely clean and undamaged. If device does not thread onto barrel freely do not force it, STOP and contact Precision Armament. Depending on firing schedule, a high temperature (i.e. Loctite® 272) or ultra-high temperature (i.e. Flexbar® Rocksett) thread locking compound may be used on the barrel threads only.

1. Hand tighten the timing nut all the way onto brake body until it stops. (**NOTE:** The timing nut is machined with a LEFT-HAND thread. This means rotating the nut clockwise will loosen it, and counter-clockwise will tighten it.)
2. Gripping the brake body only, thread the brake body/nut assembly onto barrel until it stops.
3. Rotate the brake body/nut assembly back (no more than one full rotation) until the desired timing is achieved. (This brake is symmetric and can be installed with the engraving at the 12 or 6 o'clock position).
4. Hold the brake body in timed position using either the included spanner tool inserted over the skeletonized crown (Fig. 3) or an adjustable wrench on the top/bottom flats. Note: Spanner tool can be used to assist timing alignment by eye sighting the wrench handle to a vertical orientation).
5. Turn the timing nut back until it contacts the barrel shoulder. Using the other included spanner tool inserted into the nut slots (Fig. 3) or an additional adjustable wrench on the nut flats, apply approximately 20 ft-lbs of torque. (The included spanner tool will achieve approximately 20 ft-lbs when torqued as hard as comfortably possible).

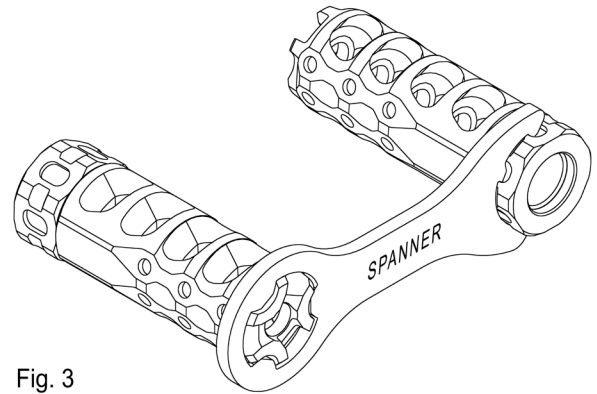


Fig. 3

**REMOVAL:** Turn the TIMING NUT in the opposite direction from installation using either the included spanner tool (Fig. 3) or an adjustable wrench. Once the pre-load torque is breeched, the brake/nut assembly will thread freely off barrel.

**WARNING!** PROPER BORE CLEARANCE MUST BE PHYSICALLY MEASURED AND VERIFIED BEFORE FIRING THE WEAPON FOR THE FIRST TIME. THIS MUST BE PERFORMED BY A QUALIFIED GUNSMITH OR ARMORER USING A PRECISION BORE ALIGNMENT ROD. DIAMETRIC BORE CLEARANCE MUST BE VERIFIED AT .060" WITH APPROXIMATELY EQUAL CLEARANCE AROUND THE CIRCUMFERENCE OF THE ROD.

**WARNING!** NEVER INSTALL THIS MUZZLE DEVICE ON A FIREARM OF A LARGER DIAMETER CALIBER THAN THE BORE APERTURE WILL ACCOMMODATE. THIS CAN ONLY BE DONE IF THE BORE IS ENLARGED TO ACCOMMODATE THE LARGER CALIBER. THIS SHOULD ONLY BE PERFORMED BY A QUALIFIED GUNSMITH. REQUIRED MINIMUM DIAMETRIC BORE CLEARANCE IS 0.060" OVER BULLET DIAMETER.

**WARNING!** This device operates by redirecting high-pressure gases at the muzzle. As a result, sound levels are significantly increased and debris, gas, and propellant particles can be propelled back towards the shooter or nearby observers. EYE AND EAR PROTECTION MUST BE WORN AT ALL TIMES WHEN SHOOTING OR OBSERVING.

**WARNING!** This device must be free of any obstructions such as dirt, mud, snow, etc. before shooting. NEVER ATTEMPT TO SHOOT THROUGH AN OBSTRUCTED MUZZLE BRAKE.

**WARNING!** If this device becomes loose or rotates during use STOP SHOOTING and immediately UNLOAD the firearm. Repeat the installation procedure before returning the firearm to service.

**WARNING!** In the event of a Bullet-to-Baffle collision or "Baffle Strike", high velocity debris may be deflected from the baffle impingement surface at an angle up to 20-degrees greater than the baffle angle (Fig. 4). This debris may include bullet and/or baffle fragmentation that is capable of causing severe bodily injury. This device has a maximum baffle angle of 35-degrees thereby creating a 55-degree Debris Backblast Zone on each side of the shooter (Fig. 5). It is important to precisely follow all installation

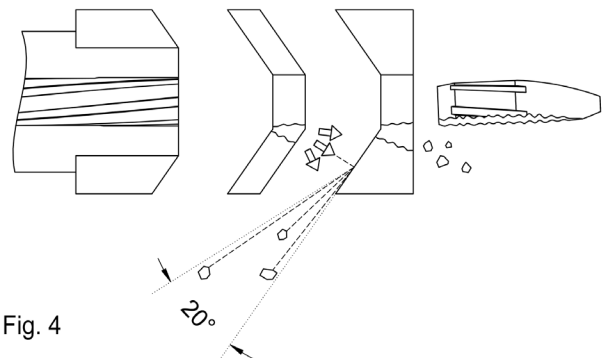


Fig. 4

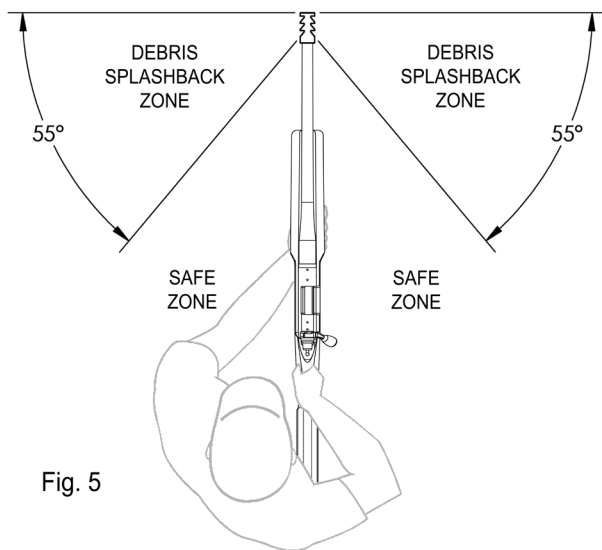


Fig. 5

and maintenance instructions to minimize the risk of a baffle strike. However, it is the responsibility of the shooter to anticipate the possibility of a baffle strike and **MAKE SURE ALL BYSTANDERS ARE CLEAR OF THE DEBRIS BACKBLAST ZONE BEFORE DISCHARGING THE FIREARM.**

**WARNING!** This device produces high pressure, high temperature exhaust jets in the Debris Backblast Zone (Fig. 5). All body parts, weapon forearms, and/or weapon attachments must be kept within the Safe Zone (Fig. 5) and at a minimum safe distance of 2 inches behind the back of the device. Any object, including body parts, located within close proximity to the exhaust jets, may be damaged, or destroyed. Any hard object located within the Debris Backblast Zone may further deflect dangerous debris causing injury to the shooter and/or bystanders.

**TUNABLE LATERAL RECOIL COMPENSATION:** This device comes from the factory in a fully neutral port configuration, meaning there is no lateral gas biasing.

In many applications, particularly when employing modern weapons and shooting stances, the factory neutral configuration will provide the lowest level of lateral muzzle movement. However, because this is not always the case, this device can be custom tuned to provide lateral recoil compensation specifically tailored to the individual shooting system, effectively allowing the shooter to further reduce or even eliminate sight picture movement when firing.

There are 6 partially drilled pilot holes on both the top and bottom of the brake body that can be individually finish drilled by the user to precisely control lateral muzzle movement. In typical applications where the lateral motion is primarily upward and possibly to one side, only the top holes will be used. Drilling out a number of these holes will create an upward gas biasing effect, thereby decreasing muzzle rise.

Chart 1: Recommended Drill Diameter

Caliber	Recommended Max Drill Diameter 'D'
.223	9/64
.264 / .308 / .338	11/64
9mm	9/64
.350/.450	11/64

Likewise, side biasing can be achieved by drilling out either more and/or larger holes on one side of the brake than the other, which will increase gas biasing to that side, and accordingly, reduce muzzle movement to the same side. The magnitude of the gas biasing effect is dependent on both the size and location of each drilled hole.

Fig. 6 provides the relative effectiveness factor for each hole based on its size and location. This is specified as a percentage of the combined maximum compensation effect achieved when all holes on the top side of the brake are drilled to a max diameter. Refer to Chart 1 for recommended maximum drilling diameter 'D' for each caliber.

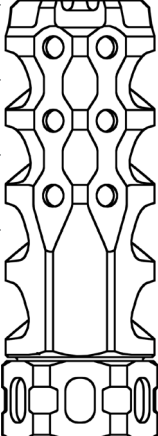
Left			Relative Effectiveness Factor		Right			
1D	.75D	.5D	←----- Drill Diameter ----->			.5D	.75D	1D
6%	3%	1%	Front		Front	1%	3%	6%
14%	7%	3%	Middle		Middle	3%	7%	14%
30%	15%	7%	Back		Back	7%	15%	30%

Fig. 6

Fig. 6

In some circumstances the bottom holes may be used in addition to the top holes. For example, if a pure side bias with no downward thrust is desired, both the top and bottom holes can be symmetrically drilled on one side. The bottom holes may also be used to correct for accidental over compensation by canceling the relative effects of their opposing top holes. Note: Drilling the bottom holes may slightly increase ground disturbance when shooting prone. To minimize this always start with the forward hole locations first.

Prior to making these modifications, it is important to understand that they are permanent. For this reason, it is recommended that this device be used in its factory neutral configuration before making any changes to determine what lateral compensation, if any, may be necessary. In applications where a more substantial down force may be desired (i.e. hunting rifles) drilling all 4 frontal top ports (FR, FL, MR, ML) to .75D is a good starting point that will produce a moderate (20% of max) compensation effect with low risk of over compensation.

**NOTE:** Pilot holes may be drilled up to 1.25D with no issue, however any drill diameter larger than the recommended max will remove all coating from pilot hole walls.

**DRILLING INSTRUCTIONS:** The following tools are required to properly finish drill pilot holes: Drill press, Sharp HSS twist drill, Small wood block.

1. Remove Brake from weapon before drilling (see removal instructions).
2. Place the wood block onto the drill press table.
3. Place opposing flat of brake body against wood block for correct positioning

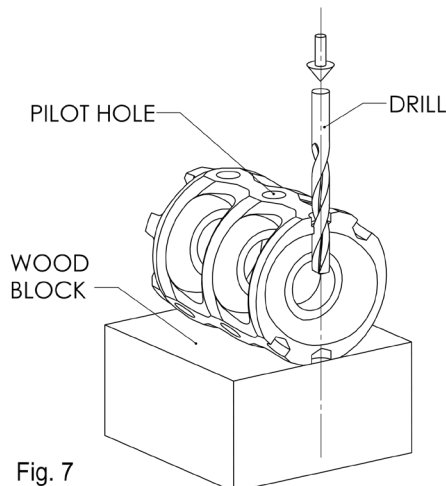


Fig. 7