

KNS Precision Inc.
Adjustable Gas Piston
for
Mini Beryl Pistol-Length
Firearms
Installation & Operation
User Manual

Patent #10,330,408

Safety Notes

- Always obey the four laws of gun handling:
 - Treat every gun as if it were loaded
 - Do not point the muzzle at anything you are not willing to destroy
 - Always be sure of your target and what is beyond it
 - Keep your finger off the trigger until ready to fire
- Ensure the firearm is unloaded before installation
- Always wear eye protection while performing maintenance on the firearm
- Always use eye and ear protection during live fire
- Always perform gas system adjustment in accordance with the user manual procedure
- Do not make large gas system adjustments without prior incremental testing to verify safe operation

Safety Disclaimer

The KNS adjustable gas piston grants a much wider range of operating force to the gas system than was originally intended. As such, it is possible for inappropriate adjustment settings to drive the firing & extraction cycles beyond safe limits of operation.

The consequences of unsafe operation can range from damage to the operating parts, to case failures capable of fatal injury.

Always perform gas system adjustments incrementally through testing in accordance with the user manual procedure to minimize the risk of unsafe operation.

Warranty Information

This product is covered by our Lifetime Warranty against manufacturer's defects and breakage during normal use of this product. For warranty issues please send an email with your contact information and product details to info@knsprecisioninc.com.

About KNS Precision Inc.

KNS Precision, Inc. had its beginning in the summer of 1999, when two friends, one a master machinist, the other a firearms enthusiast, combined to produce and market new products for the AR15/M16 platform. With overwhelming success from the start, KNS Precision, Inc. has earned the firearm and shooting industry's acceptance through product innovation and customer service.

In 2006 the machinist sold his portion of the company to his nephew, who was also a master machinist and owned a local Swiss machine shop. KNS Precision, Inc. then moved four miles from its original location to the new machine shop. In 2008, the second partner retired and a portion of the company was sold to a military Veteran and local Police Sergeant who had been the company's Law Enforcement and Military representative since 2002.

The current owners have continued the strong traditions of the company while expanding company growth, customer service and product development.

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Introduction

Congratulations on purchasing the KNS Adjustable Gas Piston!

This first of its kind enhancement to the Mini Beryl pistol provides an array of benefits previously unavailable to shooters.

Upon installation, users will enjoy:

- The ability to safely use a much wider variety of ammunition
- The ability to reduce the rate of fire and cyclic recoil
- The ability to use a silencer without causing feeding malfunctions
- The ability to quickly adjust for use with or without a silencer
- Reduced noise due to collision of operating parts and 'port pop'
- Reduced venting of gas from the chamber area to the user's face
- Repeatable, measured adjustment positions for recording settings
- A US-made component that counts toward 922r compliance
- A fully-reversible installation with no externally visible modifications
- Corrosion-resistant, easily cleaned parts for minimal maintenance

The purpose of this manual is to walk the new user through installing the KNS Adjustable Piston in their Mini Beryl pistol, safely tuning it for desired operation, and keeping it maintained. Appendices with useful information for the correct selection of KNS gas piston products, suggested adjustment starting points, and troubleshooting lie at the end of this manual.

Installation Procedure

ENSURE FIREARM IS UNLOADED BEFORE PROCEEDING

-Tools Required:

- Eye Protection
- Nail Setter Punch
- 3/32" and 1/8" Punches
- 16oz Hammer
- 1/8 Drill & Drill Press (Optional)

-Step One: Ensure firearm is unloaded before proceeding, remove bolt carrier from firearm. Remove bolt head assembly from carrier.

-Step Two: Thoroughly clean gas cup of the gas block, established carbon deposits can interfere with the different profile of the KNS piston and cause binding.

-Step Three: Locate the retaining rivet or spring-pin through the nose of the bolt carrier. This is typically located ~1/4" from the end of the carrier nose and horizontal. The rivets are ground flush with the carrier nose before finishing, so the outline of the rivet may be hard to spot at first.

Some builders punch-crimp the carrier onto the piston threads to secure it. For these, the carrier crimps must be drilled out to free the original piston head, and the KNS piston assembly drilled to match so it has the same piston length as the original. Other makers may weld the carrier & piston; we recommend buying a replacement riveted carrier instead of modifying the original, as the weld usually destroys the carrier threads beyond repair.

-Step Four: Once the retaining rivet has been marked, secure the bolt carrier in a soft-jawed vice to prevent marring the finish, and use the nail setter punch and hammer at the center of the rivet or spring-pin to begin driving it out of the carrier. Be sure to keep the punch and hammer strike perpendicular to the face of the rivet. The rivet will begin to budge after a number of solid blows. If the rivet does not budge but has been properly located, it may be necessary to use a drill press to remove the rivet; for most users this is best left to a qualified gunsmith so the carrier is not damaged.

-Step Five: Once the rivet has begun to shift under the nail setter punch, the 3/32” punch should be used to drive it the rest of the way through. Much less force should be necessary to drive the rivet at this point.

-Step Six: With the rivet removed, the factory piston can be unscrewed from the carrier. Corrosion or burrs may make this somewhat difficult on some guns, but is usually easy due to loose-fitting threads.

-Step Seven: With the piston removed, screw the KNS piston assembly fully into the carrier nose. Next, unscrew the piston only as far as necessary for one of the pre-drilled holes in the piston stem to align and center with the holes in the carrier.

-Step Eight: With the holes aligned, carefully drive the supplied spring-pin through the two parts using the 3/32” punch and hammer. Make sure the pin does not protrude from either side of the carrier. The roll pin will likely have a loose fit in the carrier hole, but this is intentional; the threads carry all the piston force, and the pin simply prevents the piston from turning.

At this point the KNS Adjustable Gas System installation is complete, and the firearm may be reassembled and adjusted for desired operation.

Adjustment Procedure

OBSERVE ALL RULES FOR THE SAFE OPERATION OF LOADED FIREARMS

The most important point to remember when adjusting the gas system of your firearm, is to begin from a safe starting point, and work incrementally toward the desired adjustment. The KNS Adjustable Gas Piston functions by venting the existing gas volume through the piston head to reduce operating force, so the 'full closed' position most closely resembles the factory gas setting, and is a safe default setting for unsuppressed firearms shooting standard ammunition. For suppressed firearms or when shooting non-standard ammunition, excessive back pressure can result in dangerously violent operation capable of damaging the firearm or injuring the shooter.

Therefore, it is recommended that initial adjustment for any gun be done in unsuppressed semi-automatic condition, with standard ammunition.

-Step One: Begin with the firearm in the unsuppressed condition, shooting standard ammunition, and the adjustment collar turned to the full-closed position with the vent port fully covered. The goal is to start as close to the 'known good' operating state the gun was in before the piston was replaced.

-Step Two: Verify the firearm can cycle in the fully closed position. Start with a full magazine to make sure the carrier momentum can overcome the friction of rounds pressed against its underside, with the selector in the semi-automatic position so the disconnecter is struck.

-Step Three: Turn the adjustment collar one (1) click toward the open position, gradually opening the vent. Repeat the function test until the gun fails to cycle, and back off a single click for a reliable 'borderline' setting.

-Step Four: Record this 'borderline' setting as the start point for further changes. Function here is reliable, and operating energy minimized.

Adjustment Procedure, Continued

OBSERVE ALL RULES FOR THE SAFE OPERATION OF LOADED FIREARMS

-Step Five: If you prefer more energetic ejection, the adjustment collar may be closed further and this preferred setting recorded. When adding a suppressor, open the adjustment collar 1-2 clicks from the 'borderline' position recorded earlier before test firing.

When using ammunition with significantly different powder or bullet weight than standard ammunition, or changing to a different chambering or barrel length, open the the adjustment collar three (3) clicks before test firing. If ammunition, chambering, or barrel length is substantially different from the original, we suggest consulting a qualified gunsmith before adjusting to verify safe operation.

This assembly is shipped with two different inserts that act in the same manner as a jet in a carburetor to limit flow. The insert that is installed from KNS has a jet diameter unique to the Mini Beryl, if your specific firearm is still overgassed with this insert, a second insert has been provided. The second insert is the “small bore” used in the Micro-Galil piston head and has a larger port and higher flow rate as compared to the Mini Beryl - in the event more gas must be bypassed.

An example of this would be the intention to use a known high-back pressure suppressor designs and/or full military specification brass-cased ammunition exclusively.

The Mini Beryl Specific insert can be identified by the “MB” laser engraved on it’s face, and by comparing the fluid passage in it’s face. The Mini Beryl specific insert has a step down in diameter past the hex tool pocket.

Both inserts are installed/removed via a 3mm hex key, installation torque is 30 in/lbs.

Cleaning Procedure

ENSURE FIREARM IS UNLOADED BEFORE PROCEEDING

The KNS Adjustable Gas Piston requires no routine maintenance beyond that of a factory gas piston. All parts of the piston assembly are finished in corrosion-resistant black nitride/Nickel-Boron so they can be easily wiped clean with your favorite carbon solvent.

After very large volumes of fire or with exceptionally-dirty ammunition, the gas piston ports or adjustment collar may become fouled. If severe enough to prevent closing of the collar or if adjustment becomes difficult, the piston head assembly can be cleaned with :

Tools Required:

- Toothbrush
- Carbon Solvent (ACDelco GM top engine cleaner PN: 10-3007)

-Step One: Remove bolt carrier group from firearm, remove bolt assembly from bolt carrier, and secure the bolt carrier in a soft-jawed vise.

There are no user-serviceable parts/disassembly beyond this point

-Step Two: Apply carbon solvent according to manufacturer's instructions and thoroughly clean fouled surfaces with brush.

Troubleshooting

While we have made every attempt to ensure your experience installing and using the adjustable gas piston is successful through extensive testing and research, the variance of AK pattern firearms and user configurations is such that you may still run into problems. Please refer to these troubleshooting points for any issues you encounter, and contact us if they cannot be resolved.

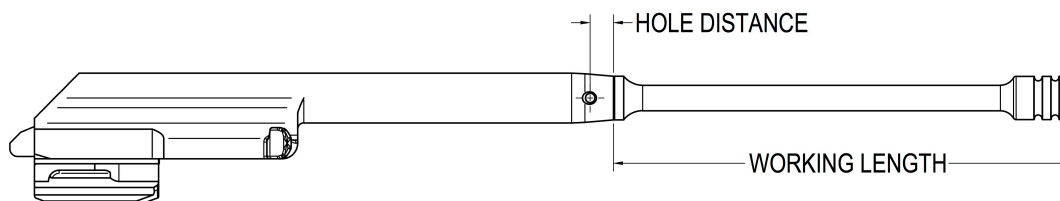
Installation:

- The roll pin securing the KNS piston does not pass fully through the carrier nose or rigidly lock the stem. It simply needs to sit at or below flush on one (either) side while preventing the stem from turning.

Adjustment:

- If your gun will not cycle unsuppressed in the full-closed position, first ensure that no other modifications that may detract from operating forces such as increased-force recoil springs are installed. If the bolt carrier group does not fully go into battery after KNS piston installation, check for and clean carbon deposits from prior firing. If the gun still will not cycle, please contact us for diagnosis of the problem.

Appendix A: Currently Available Piston Sizes



**MEASURE FROM THE END OF THE BOLT CARRIER NOSE TO THE END OF THE FACTORY PISTON,
MEASURE FROM THE END OF THE BOLT CARRIER NOSE TO THE CENTER OF THE RETAINING RIVET.
THIS WILL DETERMINE WHICH MODEL OF GAS PISTON ASSEMBLY WILL FIT YOUR FIREARM.**

**Working Length (WL), inch [mm] measurements taken from
end of bolt carrier nose to end of piston head.**

**Hole Distance (HD), inch [mm] measurements taken from
center of retaining rivet to end of bolt carrier nose.**

	WL	HD		
AGP-A-13			WL 9.63 [245mm], HD .28 [7mm] APS-S-210	
AGP-A-27	WL 7.59 [193mm] APS-S-158V			
AGP-A-10	WL 5.83 [148mm], HD .31 [8mm] APS-S-113			
AGP-A-18	WL 5.81 [148mm], HD .31 [8mm] APS-S-114			
AGP-A-20	WL 5.75 [146mm], HD .30 [8mm] APS-S-112			
AGP-A-17	WL 5.62 [143mm], HD .42 [11mm] APS-S-110			
AGP-A-9	WL 5.62 [143mm], HD .32 [8mm] APS-S-108		AGP-A-23	WL 4.19 [106mm], HD .31 [8mm] APS-S-72
AGP-A-16	WL 5.62 [143mm] APS-S-108V		AGP-A-4	WL 3.90 [99mm], HD .31 [8mm] APS-S-64
AGP-A-28	WL 5.07 [129mm], HD .32 [8mm] APS-S-90		AGP-A-3	WL 2.22 [56mm], HD .31 [8mm] APS-S-22
AGP-A-7	WL 4.78 [121mm], HD .32 [8mm] APS-S-87		AGP-A-19	WL 2.03 [52mm], HD .42 [11mm] APS-S-19
AGP-A-6	WL 4.67 [119mm], HD .31 [8mm] APS-S-84		AGP-A-1	WL 2.03 [52mm], HD .32 [8mm] APS-S-17
AGP-A-8	WL 4.66 [118mm], HD .31 [8mm] APS-S-83		AGP-A-26	WL 1.39 [34mm], HD .30 [8mm]
AGP-A-5	WL 4.41 [112mm], HD .31 [8mm] APS-S-77		AGP-A-25	WL 1.06 [27mm], HD .30 [8mm]

We are adding new piston options all the time. If you have an AK variant that does not appear in the chart above or our website, please let us know at knsprecisioninc.com and we may add it to the product lineup.

Appendix B:

Suggested Adjustment Starting Positions

Ensure the firearm cycles in the unsuppressed condition using standard ammunition, with the piston regulator fully closed, before proceeding to adjust for alternate configurations

Tuning Notes:

- Some firearms can be mis-adjusted into a dangerous operating condition by setting the gas to a powerful (closed) position in conjunction with aggravating factors like silencers/brakes, brass cases, or heavy bullets
- If adding a silencer or large-chamber muzzle device, expect to open the regulator further
- If shortening a barrel (from a previously working configuration), expect to close the regulator further, a reduced power recoil spring may also be required
- Silencers with larger bores or low-back-pressure baffle designs will not require the regulator to be opened as much as more common designs
- More powerful ammunition or ammo using heavier bullets will require the regulator to be opened further
- The KNS Adjustable Gas Piston can only ***reduce*** the operating force. Ammunition too weak to cycle with the stock piston will still fail to cycle.