



## Adams Arms

### Piston System Installation Instruction and Warning

**Please read ENTIRE warning and instructions before installing system.**  
**WARNING!!!**

Failure to follow instructions set forth in this manual can create a potentially dangerous situation for the operator and damage to the host firearm. Improper installation of this product may cause injury, damage or death.

#### **Manufacturer's Disclaimer**

Adams Arms, Inc. shall not be responsible in any manner whatsoever for physical injury or property damage stemming from criminal or negligent misuse, improper or careless handling, unauthorized modifications, defective, improper hand-loaded or reloaded ammunition, neglect, or other influences beyond our direct and immediate control. If you do not understand the instructions in this manual, please contact Adams Arms for further clarification. If you are not completely familiar with the operation and assembly of the AR15/M16 rifle, Adams Arms, Inc. strongly recommends that a professional licensed gunsmith install this product.

**Always make sure your weapon is unloaded! Visually inspect to ensure that there is no ammunition in the chamber!**

Due to the fact that many of the AR15/M16s in use today are custom rifles and not factory original guns built to military specifications, we cannot guarantee that our Retrofit Piston Driven System will function flawlessly on all rifles; therefore, we offer a 30 day money back guarantee. By following these instructions closely, our system will give you years of high performance service. For more detailed instructions go to [www.adamsarms.net/Installation](http://www.adamsarms.net/Installation)

#### **Ammunition Warning:**









**Use only brass cased, high quality, domestically produced ammo for best results. If using surplus, use high quality surplus made to NATO specifications.**

#### **Tools Needed for Installation:**

1. 1/8" hardened punch
2. 9/64" Allen key, preferably an Allen key socket
3. 5/32" Allen key, preferably an Allen key socket
4. if using Allen key socket(s): 1/4" ratchet
5. 3/4" wrench
6. metal hammer
7. bench vise
8. torque wrench
9. \*On some occasions: Dremel with cutting disk



# Retrofit Piston System Components

			
Gas Block	Plug	Sleeve/Drive Rod	
			
Modified Handguard Cap	Bolt Spring	Modified Handguards	Bushing & Spring
			
Bolt Carrier Key	Carrier Key Screws	Bolt Carrier Key Installed on Carrier	
			
Threadlocker	Receiver Bushing	10'' Dowel Rod	
			
Complete System			
			
System Installed on Upper			

## Removal of Stock Parts (Impingement System):

1. Remove the upper receiver from the lower receiver.
2. Remove the bolt carrier and charging handle from the receiver.
3. Use a 9/64" Allen key/socket to remove the stock bolt carrier key screws and pull off the stock bolt carrier key from the bolt carrier.
4. Remove the bolt from the carrier. Remove the gas rings from the bolt. Set the carrier aside for the first installation step. Set the bolt aside for the last.
5. Remove the top and bottom handguards from the barrel by pulling back on the delta ring and pulling the handguards apart. If you don't have standard handguards, remove any handguard(s) that might be on the rifle.
6. Use a 3/4" wrench to remove the flash suppressor or muzzle break along with the crush washer from the barrel.
7. Use a 1/8" hardened punch and a hammer to drive out the front sight pins that hold the sight assembly in place. Some rifles will have tapered pins. Check both sides of the pins to determine if one side is larger than the other and drive out the side that is the smallest. Once both pins are removed, remove the sight assembly/gas block and gas tube from the barrel by slightly twisting the assembly from side to side as you pull it forward off the barrel. You can use a soft mallet (e.g. rubber, plastic, or brass) to tap the assembly off.
8. Remove the stock front handguard cap from the barrel



## Installation of Adams Arms Retrofit Piston System Components

### 1. Installation of Receiver Bushing:

Install the flash suppressor onto the barrel by hand tightening it to protect the barrel threads during this step. You need to make sure that the inside gas tube hole in the receiver is clean and free of debris. Stand the upper receiver up on a table with the barrel pointing downward and orient the upper so you are able to look inside the bottom of the receiver. Place some type of heavy grease or Vaseline onto the end of the dowel rod. Lightly coat the outside of the bushing with the grease to help it slide into the receiver hole. Push the bushing onto the greased end of the rod with the external chamfered end of the bushing pointing away from the rod. Line the bushing up with the receiver hole and then firmly push down on the dowel rod to start the bushing into the receiver hole. If you can not start the bushing into the hole by using the dowel rod with hand pressure, line the bushing up with the hole to the best of your ability and then, using a metal hammer, tap the dowel rod to start the bushing into the receiver. **MAKE SURE TO KEEP THE ROD STRAIGHT WHILE DRIVING THE BUSHING IN.** Drive the bushing in until the top edge of the bushing becomes flush with the sides of the hole in the receiver. Remove the flash suppressor from the barrel.



### 2. Installation of Carrier Key:

- a. Push the stud of our carrier key into the gas hole in the carrier by twisting the key back and forth until the bottom of the key lines up with the top of the carrier slides. Align the key so it lines up with the groove in between the slides.
- b. Use a bench vise to press the key into the carrier until it bottoms out. **VISUALLY CONFIRM THAT THE KEY IS ALIGNED IN THE CARRIER KEY GROOVE OF THE CARRIER.**
- c. Use fast-drying cleaner to clean screw threads (e.g. brake cleaner). Use Loctite provided to coat screw threads before installation. Use a 9/64" Allen key/socket to tighten down the front long cap screw (supplied with system) and the back short cap screw (supplied with system) into the bolt carrier. **USE A TORQUE WRENCH! Tighten the screws to 72 in/lb! LET LOCTITE DRY 36 HOURS BEFORE FIRING!**

**Note 1:** If you plan on installing a free float handguard that does not use a delta ring, remove the delta ring now. The delta ring can be removed by using a Dremel with a cutting wheel to cut it off the barrel. The proper way to remove the delta ring is to unscrew the barrel nut from the receiver and then remove the retaining ring from the barrel nut. The delta ring and spring can be removed from the barrel nut once the retaining ring is removed. Screw the barrel nut back on and tighten down to 30 ft/lb minimum (not to exceed 80 ft/lb) to align the next slot in the barrel nut.

### 3. **Installation of Gas Block:**

- a. If you are going to use the supplied M4 style handguards, slide the new handguard cap onto the barrel. If you plan on installing a different handguard or rail system that does not require the need of a handguard cap, DO NOT use our handguard cap.
- b. Remove the gas plug from the gas block by pushing down on the detent button and turning the plug counter clockwise until the detent button aligns to the 9 O'clock position. Pull the gas plug out of the block.
- c. Slide the gas block onto the barrel with the gas plug keyway cut end pointing towards the end of the barrel. If it becomes difficult to move the gas block backwards you will have to slightly twist the gas block from side to side as you push it backwards. Be careful to not scratch the barrel as you move it from side to side.

**Note 2:** If the gas block does not slide onto the barrel you need to do the following steps to spread the gas block's legs apart:

Unscrew the gas block cap screws from the gas block and screw them into the block the opposite direction until the tips of the screws just enter the slit in between both of the legs of the gas block. Find an Allen key that will slide in between the slits in the legs. Place the long side of the Allen key in the slits making sure to point the long end towards the back of the gas block (opposite the keyway cut). The short end of the Allen key should be facing downward when the block's legs are pointing downward. You need to align the tip of the long end of the Allen key in between the back end of the back legs and the screw in the back legs. The long end of the Allen key can not extend past the back of the block. Using the 5/32" Allen key/socket, slightly tighten the cap screws while you hold the Allen key in place. Tighten both screws until they are just snug on the Allen key. You need to adjust the cap screws so the gas block will slide onto the barrel, but will **NOT** twist from side to side without any manual force. Continue with the installation skipping step "e". \*\*\*Be sure to see **Note 5**.



- d. Slide the gas block about half way onto the gas block location of the barrel (about an inch from the barrel shoulder).
- e. Tighten the gas block hex bolts with just enough pressure that still allows you to move the block from side to side on the barrel so you can align the gas block using the piston rod. You want the block to stay stationary on the barrel without any manual force.
- f. Slide the carrier (without the bolt installed) into the receiver pushing it all the way forward.
- g. Use your finger to push and hold the carrier against the barrel extension.
- h. Slide the narrow part of the rod into the front of the gas block without the spring and bushing attached.
- i. Make sure the delta ring hole is lined up with the groove in the barrel nut and the receiver hole.
- j. Slide the tip of the rod into the delta ring and receiver hole.



- k. While pushing the carrier all the way forward into the receiver, slide the rod into the receiver until it hits the carrier key.
- l. Insert the gas plug into the gas block. As you slide the gas plug into the gas block, make sure the gas plug slides into the drive rod sleeve.
- m. Push the detent button in and turn the gas plug clockwise until the detent button locates the 12 O'clock position. Hold the upper with the barrel pointing up. Use your finger to push and hold the carrier key side of the carrier all the way forward into the receiver.

**Note 3:** It is easier to complete the remainder of the installation of the gas block if it is tight enough to where it will not move forward and back (towards or away from the receiver) unless you slightly twist the block from side to side as you push or

pull the gas block forward or back. If it moves forward or back without having to twist it, tighten it until it requires twisting to move.

- n. While you continue to push and hold the carrier up into the receiver, work the gas block down towards the receiver until the space between the end of the sleeve and the shoulder on the gas plug (back part of the gas block) is taken up. If you continue to move the gas block down towards the receiver you will start to push the carrier down. The rod will push on the carrier key which will move the carrier out of battery away from the barrel extension. If you push the carrier up into the receiver as you move the block away from the receiver the carrier will move back into battery. You want to make sure that the carrier is pushed all the way forward against the barrel extension and the space between the sleeve and the gas plug shoulder is removed.

**Note 4:** If you have a flat top upper receiver, you can use the picatinny rail on the receiver to help align the gas block. Hold the receiver downward at a 45 degree angle and look down the receiver's picatinny rail and visually align the gas block's picatinny rail to it by slightly twisting the gas block from side to side. Ensure that you do not move the gas block forward or back when you twist the block to align it. Align to the best of your ability by sight.



- o. Lay the upper on a table with the picatinny part of the gas block standing up. Use your left thumb and middle finger to hold the back sides of the receiver while you use your pointer finger to push the back top of the carrier up and forward into the receiver. Try to move the drive rod back and forth. The rod should **NOT** move from side to side. If the rod moves from side to side you need to move the gas block back towards the receiver very slightly until the rod will not move from side to side. It is important to continue to push the back top of the carrier up and into the receiver. As you push on the carrier, push the detent button of the gas plug down as you slowly turn the gas plug counter clockwise. As you push on the carrier, you want to make sure that the carrier does not move forward when the gas plug moves forward out of the gas block. If you feel the carrier move forward, you want to ever so slightly move the gas block a hair forward. If you have to move the gas block make sure it is aligned properly (see **Note 4**). If you had to move the gas block forward, push the gas plug back in the block; align it to the 12 O'clock position and remove it again checking to see if the carrier moves forward. The goal is to position the gas block so the rod can not be moved from side to side when the gas plug is at the 12 O'clock position and the carrier is pushed all the way forward into battery. When the gas plug is removed from the block the carrier should not move forward. If you can not get it perfect, it is better to have a very slight side to side movement in the rod than for the carrier to move forward when the gas plug is removed from the block. If you can not move the block back far enough to stop side to side movement on the rod, you can not allow more than the thickness of 4 sheets of notebook paper to fit in between the sleeve and the gas plug shoulder. If the space between the sleeve and the plug is greater than 4 sheets of notebook paper then see "Barrel Warning". If the handguard cap is loose after the gas block location is found, do not worry; once the handguards are installed they will hold the cap tight.

**Barrel Warning:** We have experienced situations where barrel manufacturers have cut barrels out of the commercial Mil-Spec tolerances. If the gas block will not go back far enough to stop the side to side movement in the rod, your barrel might be cut out of the proper tolerance (shoulder cut too far forward). If this is the case, you can either have the barrel shoulder cut back towards the barrel extension (receiver) or buy a properly cut barrel.

**Note 5:** If using an Allen key to separate gas block's legs: As you keep the block in position, slowly unscrew the cap screws and remove the Allen key. Screw the cap screws in the standard direction.

- p. Slowly tighten the cap screws on the gas block while you hold the proper alignment position for the gas block. Alternate back and forth as you tighten the screws. \*\*\* If you tighten the cap screws too hard and fast you will twist the gas block out of alignment. \*\*\*

- q. Completely tighten the gas block cap screws and repeat step "o".

- r. Remove the gas plug and rod from the gas block. Slide the spring and bushing onto the rod and reinstall into the block.

- s. Install the crush washer and flash suppressor/muzzle break onto the barrel. Tighten down the break.



- t. Place the bolt spring on the bolt and put the bolt in the carrier and reassemble the carrier.

#### 4. **Installation of Handguards:**

- a. Push the front of the bottom handguard into the bottom of the handguard cap. Make sure the front of the bottom handguard fits under the two notches on the inside of the handguard cap. Stand the upper receiver up on a table with the barrel facing upwards. As you push the bottom handguard into the handguard cap, pull down on the delta ring and push the handguard onto the barrel nut. Let go of the delta ring when the handguard is in place.
- b. Push the front of the top handguard into the handguard cap. Pull the delta ring back and push the top handguard onto the barrel nut. Let go of the delta ring when the handguard is in place.



**Installation is complete.**

#### **Gas Position Setting and Carrier Timing:**

We recommend using FMJ Winchester White Box or Federal M193 ammo for gas setting testing.

Our piston system was designed for rifles that were built to mil-spec; most importantly, rifles that have their gas port hole drilled to mil-spec. Because of manufacturers' differences in gas port hole size, our piston system was designed with three different gas settings. These settings are found on the gas block. Looking at the front of the gas block you will see four different grooves where the detent button in the gas plug will fit once the plug is installed in the gas block. The groove at the 9 O'clock position is the insertion groove. The groove at the 12 O'clock position is the full gas setting (as pictured). The 1 O'clock position is the lower gas setting. The 3 O'clock position is the off setting. If the manufacturer of your rifle drilled the gas port hole to the mil-spec size (size changes depending on barrel length), the full gas setting should work best for the proper cycling of our system (proper velocity of the bolt carrier). Some manufacturers drill the gas port hole size out larger than mil-spec. They do this in order to get more gas (than is required) running through the impingement system so there is no chance of the rifle not working with weak pressured or non-brass ammo. If your rifle is made by one of these manufacturers, then our system will cycle faster (high carrier velocity) than what is the proper velocity.



The way to determine if your rifle is cycling too fast or slow is to watch where the spent round casings are landing after ejection. If the case is bouncing off the case deflector and landing at 12:30 to 2 O'clock then the carrier is moving at too high of a velocity. You would need to turn the system down to the lower gas setting. You want your cases to eject at 2:30 to 4 O'clock. Ejection at 4 O'clock (as pictured) should be a forceful ejection and not a lob. A short lob at 4 O'clock is too slow of a carrier velocity. The low gas setting may be used for suppressors if needed. The off gas setting will shut off the system and stop the cycling of the rifle.



#### **Full Auto Fire:**

There have been situations where we have experienced carrier bounce during full auto fire. Carrier bounce is caused by the carrier moving too fast as it moves forward into battery (too high of a velocity), where the carrier hits the barrel extension and bounces off the extension (out of battery) as the hammer is hitting the firing pin. When the carrier is out of battery, the firing pin can not hit the primer to ignite the propellant. When you experience carrier bounce, the rifle will stop running during firing; the hammer will be forward with a live round in the chamber. If you look at the round in the chamber you will usually see light primer strikes.

We recommend an H2 buffer if you are firing full auto. If you experience carrier bounce while using an H2 buffer, you may need to use a heavier buffer. Buffers are made with different weights that are denoted on the face of the buffer from lightest to heaviest: nothing on face, H, H2, H3, and X. Enidine buffers are about the same weight as an H3.

#### **Maintenance and Cleaning:**

Our system, by design, is self-cleaning. If the parts build up with carbon, you may use any kind of weapon cleaning solvent or oil to wipe the parts clean. If you find areas that don't come clean with weapon solvent or oil, you may use an edged pick, knife, or other sharp object to scrape any excess carbon off the parts. You do not have to worry about scraping the parts clean; we use a Melonite process to coat the parts which is almost impossible to scratch.

For more detailed instructions go to [www.adamsarms.net/Installation](http://www.adamsarms.net/Installation)

\*\*\*\*Please visit our website at [AR15FIX.com](http://AR15FIX.com) for warranty and return information.

Rev. 3/20/2009