The Unauthorized, Unofficial

Armorer's Manual

for the

**Hi-Point Pistol** 

## Note:

This document is not produced by Beemiller, Hi Point, MKS Supply, Iberia, Haskell, Stallard, Militec, or any affiliate of them. I do not work for them, but I use their products.

I originally produced this document hoping that no one who takes apart their Hi Point pistol for cleaning, would have to return it to the factory to have it reassembled because they didn't know where a piece went. Then, I started gathering information from different sources, and started combining it so that I wouldn't have to carry around my big green binder all the time...

Hopefully, in the future, I can totally disassemble it, and get pictures of everything.

### By using this document, you imply that you are able to follow gun safety rules, and that you are able to use basic hand tools without inflicting great bodily harm on yourself or others...

*Note: Italicized information in the disassembly section is taken from dzimmerm*@columbus.rr.com .

http://home.columbus.rr.com/dzimmerm/hi-point\_cleaning.html

## **Table of Contents**

Safety4
Introduction
Proper cartridge placement in a magazine
Specifications11
Maintenance
Disassembly
Magazine Disassembly 44
Reassembly Tips
Logs
Gunsmitiing information
Tips from the HiPoint Forum73
Holsters
Parts Diagrams 86   Stallard JS9 87   HiPoint C9/CF380 89   HiPoint C9/CF380 Compensator 90   HiPoint JC .40 S&W 91   HiPoint JCP .40 S&W 92   Stallard JS-45 93   HiPoint JH-45 95   HiPoint JHP-45 96
Related Websites



#### Always keep the muzzle pointed in a safe direction

This is the Number 1 rule of firearms safety. A firearm that is pointed away from everything will not be able to injure anyone, should it have an accidental discharge. Always treat every gun as though it was loaded. And always keep track of where your muzzle is pointed, even when the gun is unloaded.

#### Firearms should be kept unloaded at all times

Load your firearm only when you are ready to shoot. When you get done shooting, make sure to unload everything. Not just the chamber, be sure to unload the magazines also. Keep the action open on your gun when it is not in use. You should NEVER hand someone a gun with the action closed, nor should you accept a gun from someone without the action open, and then visually and physically check to make sure the gun is empty.

#### Do not trust your firearm's safety

Do not rely on the safety of your weapon to prevent a round from firing. Safeties are mechanical items, and therefore are susceptible to failure. Do not have your finger anywhere near the trigger unless you are preparing to fire the gun. Most accidental discharges are caused by a trigger being activated with a finger placed on it when the shooter was not planning on shooting.

#### Be sure of your target and beyond

A bullet fired out of a gun can travel in excess of 1 mile. Make sure that you have a good, solid backstop. If shooting at game, make sure that if you miss (we all do from time to time), the bullet will not travel beyond your line of sight.

#### Use the proper ammunition

Every gun is designed to shoot a specific type of ammunition. There may be several names for the same round of ammunition. If you are unsure of what your gun shoots or what ammo you have, ask your local gunsmith. A firearm may chamber a different caliber, but firing the wrong ammunition could result in serious injury, dismemberment, or even death.

#### Know what to do if you have a misfire

If you squeeze the trigger and the round does not fire, you may have a "hang-fire." Revert to the First Rule; be aware of where your muzzle is pointed! Keep your face away from the breech of your gun, put the safety on, and carefully open the action. Take care to properly dispose of the round. Remember, just because the round did not fire, it is still a loaded round of ammunition, so treat your gun as a loaded weapon.

#### Always wear eye and ear protection

You risk great damage to your eyes and / or ears by not wearing proper protection. A stray fragment from your ammunition could end up in your eye, there could be a mis-loaded round that causes extra-high pressure and creates a disaster; anything can happen. The noise created by firing a firearm will damage your hearing after only a few rounds, and ear plugs only cost a few cents. What are your eyes and ears worth?

#### Make sure that the barrel is clear before firing

Before firing your gun, open the action, and after making sure it is unloaded, look down the barrel to ensure that you have not collected any debris in the barrel. A small amount of dirt, snow, grease or even a stray spider's nest could increase the pressure in your barrel to the point where the gun could explode. Never try to shoot an obstruction out of your barrel, you most certainly will be injured, or at least ruin your firearm.

#### Do not modify your gun, have it cleaned/lubricated regularly

Your firearm was designed by engineers to function a certain way. Modifying or disengaging any safeties of portions of your firearm will only serve to endanger you and possibly ruin your firearm. We recommend that you only have your Hi-Point serviced by Hi-Point. After all, who knows more about how the parts fit together that the people who built it in the first place?

#### Learn all the aspects of your particular firearm

Guns from different manufacturers are very different. The individual characteristics of each gun should be learned inside and out before you chamber the first round. Read the owner's manual before ever shooting any firearm, no matter who made it. If you do not have an operation and safety sheet for your Hi-Point firearm, call (419) 747-9444 and one will be sent to you at no charge.

**Special Note:** When your Hi-Point firearm is not in use, it should be unloaded and stored in a safe place that is not accessible to children or other unauthorized person. It should not be stored with ammunition readily at hand. It should always be stored with the trigger lock in place. If you do not have a trigger lock for your Hi-Point firearm, call (419) 747-9444 and one will be sent to you at no charge.

Firearms can be a great source of good, clean, family entertainment; but only by following appropriate safety measures will the activity be safe and enjoyable.

### Introduction

Safety/Slide Lock is located at top of left grip. Sliding safety lever upward, into notch engages safety, exposes letter (S) on grip and places pistol in "Safe" position. Sliding safety lever down, out of notch, places pistol in "Firing" position.

LOADING THE PISTOL: After loading your magazine, insert it into the bottom of the handle and push it into the pistol as far as possible. When fully inserted, the magazine catch will hook the magazine and hold it in its proper position. Take the pistol in one hand with a firm grip, making sure your fingers are not touching the trigger. Point your pistol in a safe direction and with your other hand firmly grasp the serrated portion of the slide and pull it as far rearward as it will go. Release the slide from its rearmost position allowing it to go forward on its own accord. This procedure places the first cartridge into the chamber and the gun is ready for firing. Subsequent feeding and ejection operations are performed automatically until the last round is fired. At this time the slide will lock open. To disengage the hold open – remove the empty magazine, then grasp the slide at the serrated portion and pull backward until you hear an audible click. Releasing the slide will return it to the closed position.

UNLOADING WITHOUT FIRING: Always point your pistol in a safe direction before attempting to unload it. To unload unfired cartridges, move the magazine catch inward until the magazine can be pulled from the pistol. After the magazine is removed, pull the slide to the rear to remove the cartridge from the barrel chamber. As a safety precaution, always check the barrel chamber visually by holding the slide back and looking into the slide, chamber, and magazine cavities.

Barrel should be brushed every 300-400 rounds. Complete disassembly and cleaning should be performed at 1500-2000 rounds.

**Blowback** is a system in which <u>automatic</u> or <u>semi-automatic</u> <u>firearms</u> operate through the energy created by combustion in the chamber and bore acting directly on the bolt face through the cartridge. Other operating systems are <u>recoil</u> <u>operation</u>, <u>gas-actuated</u>, <u>gatling</u> and <u>chain</u>.

In the **blowback system** there is no positive lock between the bolt and the barrel. The mass of the bolt and force of its recoil spring act to keep the breech closed. The expanding gases from the fired round overcome this inertia and "blow back" the breech. The breech must be kept closed until the round has left the barrel and gas pressures have subsided. The weight of the bolt is the major factor in determining this, and to remain practical this system is only really useful for weapons using relatively low pressure rounds. Pure blowback operation is typically found only on semi-automatic small-caliber <u>pistols</u> and automatic <u>submachine guns</u>. There are also some low-velocity <u>cannon</u> or grenade

launchers using blowback, derived from the MK 108. One of these is the Mk 19 grenade launcher.

For more powerful rounds and for lighter operating systems, some form of **delayed** or **retarded** blowback can be used, in which the bolt has to overcome some initial resistance while moving. There are various forms of delaying mechanism:

- roller-delayed blowback, as in the HK G3
- gas-delayed blowback, as in the HK P7
- lever-delayed blowback, as in the FAMAS
- Chamber-ring delayed blowback, as in the Seecamp pistol
- <u>Hesitation locked</u> as in the Remington 51 pistol

While the above are effective delay mechanisms, there were some delaying systems which did not work as advertised. Two notable mechanisms are the <u>Blish lock</u> and <u>Savage</u> rotating barrel pistols. The Blish Lock used the dubious principle of dissimilar metal adhesion to delay the opening of the breech. It was eventually eliminated from the <u>Thompson submachinegun</u> as redundant. The Savage system theorized that the rifling in the barrel caused a rotational force that would hold the gun locked until the projectile left the barrel. It was later discovered that the bullet had left the barrel long before any locking could occur and that Savage pistols merely operated on a pure blowback basis; the rotation of the barrel might play a minor role by slowing the rearward motion of the slide as the slide cycled.

• **Blowback** can also refer to the combination of gasses, dirt, and debris (unburnt powder, metal shavings) that most firearms produce upon firing. This can cause great irritation to the eyes and many ranges or organizations suggest or require the use of safety glasses when firing pistols.

## Proper cartridge placement in a magazine

By "rimfirehunter" on HiPoint forums

I have not fired Wolf ammo in my C9, but I did expierence a few loading errors on my first range trip. Cause was improperly loaded magazines on my part, so its something to keep an eye on when using single stack mags.

The picture below shows a properly loaded mag on the left and an improperly loaded mag on the right. You can see the difference in how the rounds sit in the mag. The one on the right will jam just about 75% of the time when you release the slide to chamber the first round.

To get a properly seated mag you load it, the wrap the back of the mag against the open palm of your off hand. This should seat the rounds at the proper angle for feeding.



Hope this helps, if not then you know Wolf ammo is a no go for your C9.





Top picture shows correct feeding angle.

Bottom left may cause jams.



NOTE: I do not know how much the modifications in the picture will affect how the carbine functions...

## **Specifications**

All models feature:

- 3-dot, fully adjustable sights
- High-impact grips
- Trigger lock at no extra charge
- New Powder Coat finish that is a durable, attractive finish which makes gripping your pistol easier.
- An Operations and Safety Sheet is included with every firearm.
- All Hi-Point Firearms are +P+ rated; they will handle all factory ammunition including Law Enforcement Only +P+ loads

#### Safety devices

- Thumb safety simple rotary design blocks sear movement when engaged
- Magazine lock-out safety When magazine is removed, this mechanism blocks the trigger linkage.
- Last round hold open slide locks open after the last shot. To release the slide, remove the magazine or insert a loaded magazine, then point in a safe direction, pull the slide back with your free hand and release.
- Chamber observation port allows operator to observe the chamber cavity without opening the slide.

#### DO NOT INSTALL OR REMOVE THE TRIGGER LOCK IF ROUNDS ARE FOUND IN THE PISTOL/RIFLE.

To install trigger lock: The two halves are closed over the trigger (strap down). The lock head can be pushed in and rotated clockwise with the combination wrench/key provided. This is a mild deterrent. To upgrade to a strong deterrent level, a customer supplied padlock must be attached. Always twist and pull on lock to make sure it is secure on the pistol/rifle.

To remove trigger lock: Support side opposite lock head with one hand and, using the wrench/key, push in lock head and turn counter-clockwise. Lock head will pop out and lock may be removed.

Passive internal drop safeties

• Sear block – a spring loaded plate that falls under the sear pin arm when the pistol is dropped on its rear.

• Counter weight – a weight that counteracts the sear movement when the pistol is dropped on its handle.

#### Model CF-380



Suggested Retail Price: \$ 120.00

Caliber: .380 ACP (also called 9mm Kurz, 9x17mm) Barrel Length: 3.5" Overall Length: 6.75" Weight: 25 Ounces Frame: High-Impact Polymer Finish: Powder coat (Black) with Chrome rail Sights: 3-dot, Fully adjustable rear sight (Windage and Elevation adjustable) Magazine: 8 Round capacity

#### Furnished with a trigger lock at no extra charge.

The Hi-Point CF-380 features a 3 ½ inch Barrel, Adjustable Sights, 8 round magazine, Last Round Hold Open. These features produce a compact 380 that is incredibly accurate with Ultra-Low Recoil.

Hi-Point makes handgun that are sighted to feel good in your hands, therefore allowing you to have a more comfortable shooting experience

The polymer frame used on the 380 offers the shooter several advantages. First it will decrease the weight of the weapon. Secondly, the forgiving nature of polymer will decrease recoil when firing. The polymer used by Hi-Point is a very Hi-Tech durable material that will last for decades to come.

## .380 ACP Model 380 COMP

Model 380COMP and 380COMP-L

Suggested Retail \$ 120.00

Caliber: .380 ACP (also called 9mm Kurtz, 9x17mm) Barrel Length: 4.0" Overall Length: 7.75" Weight: 31 Ounces / 47 Ounces with Laser Frame: High-Impact Polymer Finish: Powder Coat (Black) with Polished sides Sights: 3-dot, Fully adjustable rear sight (Windage and Elevation adjustable) Magazine: All 380COMP pistols come with 2 magazines, 8 round and 10 round capacity.

#### Furnished with a trigger lock at no extra charge .



Suggested Retail \$ 190.00

#### 380 Comp Pistol shown with Optional Laser

Hi-Point Firearms introduces the new 380 Comp Gun. This new gun features a 4" Barrel, Adjustable Sights, shipped with 2 mags, one 10 round and one 8 round, Magazine Disconnect Safety, Muzzle Compensator, and Last Round Hold Open. These new features produce a compact 380 that is incredibly accurate with Ultra-Low Recoil. The 380 Comp Pistol is also available with a Laser mounted to the compensator.

Model C9



Caliber: 9mm Parabellum (also called 9mm Luger, 9x19mm) Barrel Length: 3.5" Overall Length: 6.75" Weight: 25 Ounces (Polymer Frame) Frame: High-Impact Polymer **Finish:** Powder Coat (Black)

**Sights:** 3-dot, Fully adjustable rear sight (Windage and Elevation adjustable) **Magazine:** 8 Round capacity standard - 10 round magazines optional.

#### Furnished with a trigger lock at no extra charge.

Consumers already recognize the 9mm Compact as an exceptional value in its category. Now polymer technology has allowed us to take this popular handgun one step farther. The 9mm Polymer is ¼ lb. lighter than our original 9mm Compact. At 29 oz., this all-weather handgun boasts an even smoother action, reduced recoil, and a scratch resistant frame.

\*New rear peep sight for handguns shipped with each gun. All Hi-Point firearms now shipped with dual lock trigger. .

#### Advantages of the Polymer Frame:

The Polymer frame used on the 9mm Compact offers the shooter several advantages. First, it will decrease the weight of the weapon. Secondly, the forgiving nature of the polymer will decrease the felt recoil when firing the weapon. The polymer frame that is used by Hi-Point is a very high-tech, durable material that will serve the shooter for decades to come.

#### Model C-9 COMP and C-9 COMP-L



Suggested Retail Price: \$ 169.00

Caliber: 9mm Parabellum (also called 9mm Luger, 9x19mm) Barrel Length: 4.0" Overall Length: 7.75" Weight: 35 Ounces / 41 Ounces with Laser Frame: High-Impact Polymer Finish: Powder Coat (Black) Sights: 3-dot, Fully adjustable rear sight (Windage and Elevation adjustable) Magazine: All C-9 COMP pistols come with 2 magazines, 8 round and 10 round capacity.

Furnished with a trigger lock at no extra charge.

Advantages of the Compensated C-9 Pistol:



Suggested Retail Price: \$219.00

The Compensator attached to the end of the C-9 Comp Pistol serves two purposes. It has been designed to re-direct the propellant gases that follow the bullet from the barrel, channeling them upward after the bullet has left the bore. This will counteract the natural tendency of a pistol to lift up in recoil, thus reducing the felt recoil. Secondly, the Compensator has been slotted on the underside to allow for mounting of accessories. One option (Hi-Point Factory Option) is a pressure-pad activated red laser. Using this laser will allow shots to be placed on target without having to line up the sights. For a tactical situation, a \*white light\* flashlight can be mounted on this rail in place of the laser, enabling the shooter to positively identify the object toward which the pistol is pointed.



Model 40SW / Poly

Suggested Retail Price: \$ 179.00



Suggested Retail: \$239.00

Caliber: .40 S & W Barrel Length: 4.5" Overall Length: 7.72" Weight: 32 Ounces Frame: NEW Ploymer frame Finish: Powder Coat (Black) Sights: 3-dot, Fully adjustable rear sight (Windage and Elevation adjustable) Magazine: 9 round capacity Last round lock open Quick on & off thumb safety Magazine disconnect safety

#### Furnished with a trigger lock at no extra charge.

The .40 S&W Polymer magazine will interchange with the NEW .40 S&W Carbine.

#### Advantages of the .40 S & W Cartridge:

The .40 S & W cartridge is a high-pressure, modern cartridge designed from the beginning as a smaller package answer to a proposal for a new cartridge brought forth by the F.B.I. It is capable of higher pressure and utilizes a heavier bullet than the 9mm cartridge. It has been adopted by several major Police Agencies all over the United States, including the California Highway Patrol, Ohio State Highway Patrol, and numerous others. It has proven itself to be an effective cartridge; with more versatility than the 9mm. Due to the pressure and power that it generates, Hi-Point has built their .40 S & W on a larger frame, to enable the shooter to enjoy shooting their firearm, without dreading it.

#### 45 ACP (also called 45 Automatic)



Suggested Retail Price: \$179.00



Suggested Retail: \$239.00

Caliber: .45 ACP (also called 45 Automatic) Barrel Length: 4.5" Overall Length: 7.72" Weight: 32 Ounces Frame: NEW Polymer Frame Finish: Powder Coat (Black) Sights: 3-dot, Fully adjustable rear sight (Windage and Elevation adjustable) Magazine: 9 round capacity Last round lock open Quick on & off thumb safety Magazine disconnect safety

#### Furnished with a trigger lock at no extra charge.

#### Advantages of the .45 ACP Cartridge:

The .45 ACP cartridge is a long-proven military cartridge. It was first brought into use in 1911 by the US Army; and still serves as the standard or optional cartridge in hundreds of military forces all over the globe, including the U.S. Special Operations Command. It uses some of the heaviest bullets in a semi- automatic handgun, up to 230 grains. It has been in use for over 80 years.

Due to the pressure and power that it generates, Hi-Point has built their .45 ACP on a larger frame, to enable the shooter to enjoy shooting their firearm. Whether shooting bowling pins, hunting, or protecting lives, the .45 ACP has been doing the job since the turn of the century.

## Maintenance (Cleaning and Lubrication)

#### **CLEANING EQUIPMENT**

- <u>Cleaning Rod</u> The cleaning rod is used to push cleaning attachments, i.e., brushes, patches or jags through the barrel. The cleaning rod should be inserted from the **chamber end** of the barrel when possible. It should be long enough to pass completely through the barrel and strong enough to resist bending when pressure is applied. Cleaning rods are made from various materials: however, brass, aluminum or coated metal are the most desirable. Regardless of the type of cleaning rod selected, improper use may cause excessive wear on the barrel, especially at the muzzle end. Continual wear on the muzzle is detrimental to the accuracy of the weapon.
- Bore Brush Bore brushes can be of several types: nylon, brass or bronze, and stainless steel. The brass or bronze brush is recommended for cleaning the bore. Nylon bristles are rarely strong enough to loosen bore fouling and stainless steel bristles are overly aggressive due to their hardness. The bore brush used should be of the same caliber in size as your semiautomatic pistol. The bore brush is most effective when used with solvent.

Use a bore brush only in the barrel of the weapon; do not use it as a general-purpose scrub brush.

Do not reverse direction while the brush is actually in the barrel. Instead, push the brush slowly all the way through the barrel before reversing direction. This will maximize the cleaning potential of the bore brush, as well as maintain its usefulness over a longer period of time.

<u>Slotted Patch Holder and Jag</u> These devices are used for pushing the patches through the barrel. Care should be exercised when using either to ensure that they do not mar the lands and grooves of the barrel.

The slotted tip allows the patch to be moved through the bore primarily for solvent distribution. The jag allows for a more precise fit of the patch in the bore to enhance removal of firing residue. Use the correct diameter jag to ensure a tight fit of the patch in the bore.

- <u>Patches</u> Patches are either round or square and should be made of soft, absorbent material. Some patches have a woven side and a fibrous side. The woven side may assist in introducing solvent into the barrel and provides a scrubbing surface, while the fibrous side may be used to remove the residue left by the solvent's chemical action. Patches may also be used to dry the bore and lightly lubricate the entire pistol.
- <u>Cleaning Solvent</u> There are many commercially available cleaning solvents that do an excellent job of removing both powder residue and metal fouling.

Cleaning solvents should be used to loosen and remove powder residue, and copper or lead fouling. Use cleaning solvents that are manufactured for weapon use only. If a cleaning solvent is used, be sure all solvent is removed before applying any lubricant, as the solvent will reduce the effectiveness of the lubricant.

**WARNING**: Some cleaning solvents and treated cloths may be detrimental to the finish of your pistol. <u>Always read the manufacturer's recommendation for use and the warning label</u> before using.

- Wet Brush A nylon toothbrush with a lubricant, preservative or similar material to dissolve and remove firing residue can be used to clean areas of the weapon that are hard to reach. For optimum results, this brush should have bristles located at each end similar to today's issue military style brush. A moistened toothbrush works well on the interior of the frame, the underside and face of the breechblock, behind the extractor, the exterior of the slide, and any other location where firing residue may accumulate. It is not recommended that solvent be used in areas where it may collect and cannot be removed.
- <u>Dry Brush</u> A dry nylon brush, such as a toothbrush, makes the cleaning process easier in areas where solvent is not desired such as the grips, and when removing lint and minor fouling from the front and rear sights, trigger, etc.. Lint and fuzz that accumulates in the holster can also be removed using a dry brush. A military style brush not yet exposed to lubricant or solvent will best satisfy this requirement.
- <u>Screwdriver</u> A screwdriver of proper size should be used for tightening all screws. Correct blade size prevents mutilation of screw head slots. For best results, the blade must fit the slot snugly in both width and length.
- <u>Cleaning Cloth</u> A clean, absorbent, lint free cloth is necessary for cleaning the weapon and protecting it from hard surfaces during the cleaning process. Cheese cloth is one of the most widely recommended. Too often the effort to keep the weapon clean is defeated by the contamination of dirt, grease, fouling, etc., from a soiled cloth. Once the cloth becomes soiled discard it.

A mechanical stoppage while firing is less likely to occur if a clean lint free cloth is used.

<u>Treated Cloth</u> There are a number of separate applications for the treated cloth. This makes it extremely important to read the instructions on the packaging concerning both use and storage. The most widely used cloths are impregnated with a finish preservative. Silicon, microscopic solids, or petroleum-based substances are used to cover surface areas of pistols to prevent deterioration of the finish due to oxidation and corrosion.

Other types of cloths are designed for lead removal in the bore as well as fouling accumulation elsewhere. These cloths may be harmful to the weapons finish and should only be used following the manufacturer's recommendations.

#### <u>Air Hose</u>

#### Advantages

Excellent for blowing out dirt particles or excess cleaning solvent from areas

hard to reach with the soft brush or cloth.

Excellent for blowing out holster and magazine pouches.

#### <u>Air Hose</u>

Disadvantages · May blow solvent, dirt particles or lubricants into the face, the pores of the skin, or the clothing of the user or other persons.

- Dirt particles may be blown back into the mechanism rather than out, contributing to a stoppage.
- Condensation may accumulate in the air tank and hose, which, in turn, will introduce moisture to the surfaces being cleaned causing rust (consider using dry air).
- Pressurized air blows contaminants back into the breathable air and over all exposed surfaces in the immediate area.
- Can be detrimental to hearing. Air-hose nozzles should be OSHA approved for noise reduction.
- Ear protection may be required depending on the number of airhoses being used at one time.

#### **Lubrication**

The purpose of lubricating a pistol is to provide a molecular barrier between metal parts to reduce friction and prevent solidification of firing residue. A lubricant/preservative is used to maintain the integrity of the finish through a similar molecular barrier between the pistol's surface area and its environment. Semiautomatic pistols require lubrication in order to ensure consistent, reliable functioning. Conversely, excessive lubrication may affect reliable function of the weapon. Excessive lubrication is recognized as lubricant moving on the weapon under the influence of gravity. Manufacturer's guidelines on lubrication should be strictly adhered to. The specifics of the guidelines may be found in the owner's manual, Armorer manual or through correspondence with the manufacturer.

Environmental extremes such as coastal salt air, humidity and broad shift in temperatures expose unprotected metal to attack, requiring frequent attention with a lubricant/preservative versus a desert environment where the natural attraction of dust and grit to the lubricant becomes a negative factor.

Lubricant/preservative products are available in a number of different consistencies that range from grease, to liquid, to dry, all of which have application. Be sure you read the manufacturer's directions for use and evaluate your own needs pertaining to the actual application of the pistol.

A weapon is not considered properly lubricated unless the lubricant's presence can be visually and physically verified by the operator.

#### CLEANING AND LUBRICATION PROCEDURES



Frame

Use a nylon brush with a lubricant, preservative or similar material to dissolve and remove any firing residue in or on the frame. Pay particular attention to the magazine well, frame rails, and surfaces that interlock with the barrel. Once the frame is clean it should be lubricated by saturating a cleaning patch with a lubricant/preservative and wiping all exposed metallic surfaces. Give emphasis to lubricating the frame rails and the surfaces that interlock with the barrel. Wipe exterior of the frame with a clean patch to remove any excess lubrication.

Barrel

Thoroughly clean the barrel using a bore brush of the correct diameter that has been moistened with cleaning solvent. Use a cleaning rod long enough to reach all the way through the bore. The brush should pass completely through the barrel, starting from the chamber end, at least ten (10) times in a reciprocating fashion. Emphasis should be placed on the cartridge seat located at the forward edge of the chamber. Cleaning the cartridge seat can be enhanced by twisting the cleaning rod and turning the brush while it rests against the forward edge of the chamber.

**NOTE**: Always clean the barrel from the chamber end when possible. Allow the cleaning solvent sufficient time in the barrel for the chemical action to dissolve the fouling. Read and apply the solvent manufacturer's recommendations.

Replace the bore brush with a slotted patch holder or jag and affix a clean,

dry patch. For maximum effect the cleaning patches should fit the bore snugly. Push the patch slowly and carefully through the barrel. Repeat this process with clean patches until the barrel is clean and dry. Brush any remaining residue from the barrel giving specific attention to the feed ramp and chamber mouth areas.

Most manufacturers recommend that the barrel be lubricated on its interior and exterior for friction reduction and surface preservation. This may be accomplished by saturating a cleaning patch with a lubricant/preservative and wiping all surfaces of the barrel. Finish the barrel by pushing a final clean, tight fitting patch through the bore to remove any excess lubricant, which may contribute to ammunition failure.

- <u>Recoil spring and guide</u> The recoil spring and guide may be cleaned and lubricated by the operator either separated or together. In either case firing residue should be brushed from the surface areas of both parts. Lubrication is accomplished by saturating a cleaning patch with an appropriate lubricant/preservative and wiping down all exposed surfaces of the recoil spring and guide.
- <u>Slide</u> Clean the interior and exterior of the slide with a nylon brush and an appropriate lubricant/preservative to dissolve and remove all firing residue. The slide rails and locking surfaces should be thoroughly cleaned as should the breech face (SPECIAL ATTENTION MUST BE GIVEN TO CLEANING THE EXTRACTOR). Foreign material and firing residue around the breech face and extractor can cause extraction related stoppages as well as failures to feed. After cleaning, wipe all exposed surfaces of the slide with a lubricant/preservative-saturated patch. Wipe the exterior surfaces of the slide with a clean patch to remove any excess material.

**NOTE**: The pistol is not considered clean "unless the magazine is clean also".

<u>Magazine</u> The magazine is easily disassembled and may be cleaned with a nylon brush and/or soft lint free cloth. In addition, the metal surfaces may be treated lightly with a commercially available lubricant/preservative. Finalize the cleaning and lubrication by wiping all surfaces with a clean cloth. This will prevent ammunition contamination, but allow the metal surfaces to be protected from the environment.

A good rule of thumb when cleaning and lubricating anything is that if two surfaces have to rub against each other or pivot around something that area should be lubricated. I put a drop of oil on all such points as well as on the end of each spring that I could easily get to. You will need to wipe off any excess oil after you are sure the oil has coated the parts you wish to have lubricated. You can install the magazine into the pistol with the slide removed and note how the trigger action works.

There are a couple of places where grease should be used instead of gun oil. The slide is not made of steel. It is some kind of alloy, probably mostly aluminum. Aluminum is a softer metal than steel and it will start to wear away if you do not lubricate it properly. One of the places you need to grease is the part of the slide that has the grove that the slide retainer fits through. The slide retainer is a steel part and it will wear into the grove if the grove is not lubricated with a good grease. I am currently using a synthetic brake caliper grease but I imagine any hi pressure grease would work. I will probably try and locate a lithium or molybdenum grease for this purpose. A note of caution. The area of the slide which holds the firing ping and its spring and collar should NOT be greased. This area should be lubricated with gun oil. The way I did this was I oiled the firing ping, spring, and collar and then put the slide retainer into the grove. I used the slide retainer to push the firing pin, spring and collar into place then I removed the slide retainer and put a very light coat of grease on the ball part of it. I did this right before reassembling the slide back onto the frame. After the slide was on the frame I applied more grease to the part of the grove that is exposed when the slide is locked in the rear position.



# Disassembly



http://img.photobucket.com/albums/v151/wolf\_from\_wv/takedown\_tools.jpg

- \* 1/16" punch
- \* 3/32" punch. The factory paper calls for a 1/8" punch.
- \* 1/8" punch (made from part of a long-shank drill bit)
- \* 3/16" punch
- \* Ball pein hammer.
- \* 1/8" flat-blade screwdriver
- \* #2 Phillips screwdriver
- \* factory take-down tool
- \* Wood bench block or hockey pucks
- \* 3/32" Allen Wrench is needed to remove the rear sight

#### NOTES:\_\_\_\_\_

The "support kit" with the extra tools...





NOTES:	 	 



#### http://img.photobucket.com/albums/v151/wolf\_from\_wv/step\_one.jpg

Step one is to knock the pin out of the slide retainer. Once you have done that, pull back on the slide, and lift up. DON'T LOSE THE SPRINGS!

Removal of the slide is briefly described in the literature that comes with the pistol. I used a small wooden block to help support the body of the pistol. I have also found that the recommended 1/8 inch punch is a little to big to easily drive the slide retainer pin out. I use the next smaller size which is a 3/32 inch punch. When I pull the slide back to engage the safety to lock the pistol open I noted that the notch in the slide did not completely clear the slide retainer pin hole. In order to keep the slide back just a bit more I put the tag end of the breech safety plug between the safety lever and the notch in the slide. This allows just enough more rearward positioning of the slide so the slide retainer pin hole is not partially blocked by the slide. This little tip keeps you from fighting with lining the punch up and allows the pin to be easily tapped out of the body of the pistol. Once the slide retainer pin is removed you can raise the rear of the slide which pulls the slide

retainer out of the frame of the pistol. Once the slide retainer is clear of the pistol frame the slide can be moved forward.

Two things to watch out for. Their is a large spring that normally pulls the slide forward. This is the recoil spring which is located beneath the pistol barrel between the barrel and the forward part of the frame. This spring may or may not fall out depending on how you are holding the pistol when the slide is brought forward. The only secret is to know that the end of the spring with the plastic recoil spring guide rod in it goes towards the front.

NOTES:	 	 



http://img.photobucket.com/albums/v151/wolf\_from\_wv/top\_view.jpg

This shows the sear and how it is aligned. I do not recommend dry-firing the pistol while the slide is off. The sear assembly has a little spring underneath of it that will pop out if you do.

As an aside, I read an article that claimed Hi-Points only use a crude safety that locks the slide assembly. Once the slide is off you can see that the statement is either a lie or the result of ignorance on the part of the politician who stated it. The safety does lock the slide but it also keeps the sear assembly from dropping. The sear assembly is also prevented from dropping when the magazine is more than halfway out of the pistol frame. The sear assembly drops to release the firing pin. No drop, no firing pin release, no bang.

NOTES:\_\_\_\_\_



#### http://img.photobucket.com/albums/v151/wolf\_from\_wv/firing\_pin.jpg

This is a picture of the firing pin, buffer, spring, and the new slide retainer. The new slide retainer has a flat machined on it so that it doesn't turn inside the slide. It makes putting the pistol back together <u>MUCH</u> easier. In the picture below, the new style is on the right.



The second thing to watch out for is the firing pin spring, firing pin spring cup/collar, firing pin, and the slide retainer. These all fit in a machined hole in the slide. They can and will fall out of the back of the slide if the back is pointed down. I remove them and clean them anyway but it is a good idea to keep track of the parts so you know how to put them back together. One thing I have noted on my particular pistol is that my pistol does not have a firing pin spring cup. My firing pin assembly has the firing pin, a firing pin spring, and plastic collar that fits over the spring. My guess is that Hi-Point made a design change and did not include this in the drawing of their pistol.

NOTES:	

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http://img.photobucket.com/albums/v151/wolf\_from\_wv/right\_side\_without\_grip.jp g

The magazine lockout fits with the "\_" part of the "L" at the bottom. The little wire spring fits with the "\_" part of the "L" in the little hole in the magazine release button. To remove the grip, lift the top of it up a little, and then lift the grip towards the top of the pistol. For normal cleaning, you probably don't need to remove the grip, but if you do, this is how everything lines up.....

The first time I took my pistol apart I took the left and right grips off. This is not needed if you just wish to clean the pistol barrel from the breech end. The grips hold a number of levers in place and removing them could get you into trouble unless you carefully note where all the levers and springs are.

NOTES:\_\_\_\_\_



http://img.photobucket.com/albums/v151/wolf\_from\_wv/sear\_cam\_alignment.jpg

Without at magazine in the pistol, the place indicated by the arrow fits in the notch (D), and blocks the trigger and sear cam from operating (C). When you insert a magazine, it is pushed up, allowing the trigger and sear to operate. The trigger linkage (A) pushes down on the cam (B), which pulls down on the sear. This allows the firing pin to advance forward, and strike the primer.



NOTES:	 	 

(A.) Sear is removed by tipping the cam slightly to the right.



Then, the sear can be lifted up and out.

NOTES:\_





(A) Underneath the sear, is the counterweight pivot pin.



The counterweight is removed through the magazine well. (Flat side goes down.)



http://img.photobucket.com/albums/v151/wolf\_from\_wv/left\_side\_no\_grip.jpg

This is a picture of the magazine release/ safety side with the grip removed.

## NOTES:\_\_\_\_\_



(A) This is the ejector pivot pin. It should be driven towards the top of the slide. When you remove the punch from the hole, watch out for the spring that is behind the ejector.

# **Magazine Disassembly**

C9 10 round magazine

Tools needed:

pencil punch possibly an extra hand or two

### Disassembly

1. Push follower most of the way into the magazine with the pencil.

2. Stick the punch through one of the "witness holes" below the follower.

3. While the punch holds the spring, shake the follower out of the top of the magazine.

4. Point in safe direction, and take the punch out of the hole. SPRING WILL FLY OUT! Try not to let it fly out, so you can see how the spring is lined up in the magazine.

## Assembly

2. Make sure spring fits over posts in magazine floor plate.

3. Push magazine down with pencil. (Something flat, the length of the follower would be better.)

4. Stick punch through "witness hole", to catch the spring.

5. Guide follower through lips on front of magazine.

- 6. Push follower down to the spring with the pencil.
- 7. Pull punch out of hole, and let follower gradually come up.
- 8. Load magazine with dummy cartridges, and test for function.

C9 8 round magazine

<sup>1.</sup> Line spring up, and stick in magazine.

# **Magazine Followers**



Top to Bottom: Old to new style



Left to right: Old to new style



The barrel is held in by pins.

Newer models have an observation port so you can see if there is a round in the chamber.



# **Reassembly Tips**

#### INSPECTION

Be sure that the pistol is safely unloaded ("check twice") before inspection. The following should be part of that inspection:

Sights Are they properly configured and positioned correctly?

Do they fit tight on the slide?

<u>Barrel</u> Is it clean? Barrel and chamber should be inspected for fouling and other firing residue that may be accumulating.

Is the feed ramp smooth and contoured correctly?

Are there pits inside the barrel? Pits may weaken the metal and allow gas to escape around the bullet reducing accuracy and velocity.

The crown/muzzle end of the barrel should be inspected for wear, nicks or any damage that could affect accuracy. Does it match the slide and frame by proper fit and/or serial number?

#### Recoil Spring and Guide

Inspect the spring for straightness, continuity of the wire wraps, equal separation of

the individual coils and proper fit on the recoil spring guide.

Inspect the spring guide for smoothness, straightness and flange integrity.

Frame/Slide Inspect the frame and slide for the appropriate serial numbers.

Check the sights for visible damage and proper fit in the dovetails of the slide.

Verify that there are no abnormally protruding pins from the slide or frame.

Visually check for cracks, excessive wear or stress marks.

Verify that all screws are in place and tight.

Check the grips for proper fit and damage.

NOTES:	



http://img.photobucket.com/albums/v151/wolf\_from\_wv/align\_pin\_and\_hole.jpg

When you go to reassemble the pistol, the slide retainer goes down in the hole indicated. Once you have reassembled the pistol, pull the slide back a couple times, and test for function with a snap cap.

The hard part about installing the slide is getting the hole in the slide retainer to line up with the hole in the frame that the slide retainer pin goes through. The first time I tried this it took about 6 tries before I got lucky and got it lined up. The first time I did NOT put a light coating of grease on the ball part of the slide retainer. I only had gun oil on it. This made the slide retainer hard to control. A light coat of grease on the ball part of the slide retainer will stop the slide retainer from twisting as you ease it down into the hole in the frame that it normally resides in. Once the slide retainer along with the slide is in place you will need to gently tap the slide retainer pin back into place. Remember to put the tab part of the breech safety plug between the safety lever and the notch in the slide. Once the pin is started you can use the punch to center it in the frame so that the same amount of space is showing on both sides of the frame.

NOTES:	 	 	

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# Logs

# **Owners Log**

Model	Serial Number
Date Purchased	
Accessories purchased	

Date	Service	By

# Gunsmithing Information

## **Ghost Ring Sight Installation**

To remove open sight from sight base:

1. Use allen wrench and screwdriver to remove rear sight from slide. Place screws and elevation spring to the side.

2. Turn windage screw counterclockwise until open sight releases from left side of sight base

To install ghost ring sight:

1. With inset (counter bore) side towards you, start ghost ring into the key hole slot in the left side of the sight base. Turn windage screw clockwise to center.

2. Reinstall ghost ring and sight base back into the slide, being careful to properly align the elevation spring.

Do **NOT** over tighten the elevation screw.

# **Screw Sizes**

Location	Size

# **Roll Pin Sizes**

Location	Size



Headspace Nominal Minimum: Nominal Maximum:

Rifling: 9LH 1 in 10"

\*







Headspace Nominal Minimum: .675"? Nominal Maximum: .681"?

Rifling: 9LH 1 in 10"



## .40 S&W DATA



Headspace Nominal Minimum: Nominal Maximum:

Rifling: 7LH 1 in 10"

\*

## .45 ACP DATA



Headspace Nominal Minimum: Nominal Maximum:

Rifling: 7LH 1 in 12"

\*

# Troubleshooting **Note: some of this may not apply.** Chart from "Pistolsmithing" by George C. Nonte, Jr.; © 1974

Malfunction	Probable Causes	Corrective Action
Misfire	Broken or bent firing pin	Replace
(shallow or no dent in	Weak mainspring	Replace
primer)	Excess headspace	Replace barrel
Slamfire	Defective cartridge	Check ammunition
	(protruding primer)	
(cartridge fires as slide closes)	Firing pin jammed forward	Clean out hole, replace pin
Fails to extract	Broken extractor	Replace
	Rough or pitted chamber	Polish chamber or replace barrel
	Short recoil	Check ammunition Check for slide interference
Fails to eject	Broken or missing ejector Short recoil	Replace Check ammunition Check for slide interference
Fails to feed	Bent or worn feed lips Rough feed ramps	Replace or repair magazine Polish smooth
(bullet nose jams on ramp)	Uneven ramp joint	Polish smooth
(cartridge jams nose-up)	Bent feed lips	Replace magazine
(slide rides over cartridge)	Magazine not fully seated	Reseat magazine
Slide doesn't stay open after last shot	Slide stop or notch in slide worn or broken	Replace
	Follower bent	Repair or replace
Magazine falls out	Worn or broken magazine	Replace
	catch	Repair or replace
	Worn catch notch in	
	magazine	
Hammer won't cock	Broken sear or broken sear	Replace
	spring	Darkara
	Broken hammer notch	Replace
and/or gun doubles	l oo little sear engagement or wrong sear angle	Replace sear and nammer
Hammer drops from safety notch when trigger is pulled	Broken safety notch	Replace hammer
Fires with slide retracted more than 1/8" inch	Broken or worn disconnector	Replace
Hammer won't fall when	Broken sear bar	Replace
trigger is pulled	Trigger jammed	Inspect and clear
	Disconnector jammed	Inspect and clear
	Sear jammed	Inspect and clear

	Foreign material in action	Clean
Hammer falls when safety is engaged (if not hammer- dropping safety	Safety worn or broken Safety spring broken	Replace Replace
Hammer does not fall when hammer-dropping safety is engaged	Trip lever worn or broken	Replace
Hammer falls but is caught by safety notch when trigger is pulled	Sear, sear bar, trigger linkage worn	Replace
Slide won't go fully forward	Bulged or too-long cartridge Excess dirt between barrel and slide Barrel not correctly fitted	Clear and inspect ammunition Clean
Trigger does not return	Broken trigger spring	Replace of relit
forward after firing	bioken ingger spring	Replace
Magazine won't accept full number of cartridges	Dented body	Straighten or replace
Slide refuses to move thru full travel but is loose on frame	Broken or bent recoil spring or guide	Replace
Slide stop engages before last round is fired	Slide stop spring too weak Stop lip is being lifted by cartridges in magazine	Replace or tighten Cut lip back
Safety disengages while gun is being carried	Safety spring or detent loose or weak	Replace
Cartridge jams only halfway into chamber, but properly aligned	Excessively dirty chamber Piece of cartridge case mouth stuck in chamber	Clean and polish Remove and polish chamber
Cartridge chambers and slide goes into battery but extractor won't engage rim	Oversize case rim Dirt under extractor Bent extractor Excess headspace	Check ammunition Strip and clean Repair or replace Replace barrel
Fired case extracts but is rechambered	Short recoil Light load	Check for slide interference Check ammunition
Extractor pulls through case rim	Very rough or dirty chamber	Clean and polish
Slide jams rearward	Bent recoil spring guide or battered abutment in frame Bent or loose ejector	Repair guide, clean off burrs Repair or replace
Slide jams forward	Bent or broken recoil spring guide Improperly fitted barrel	Repair or replace Refit or replace

	Bent barrel bushing	Replace
Slide stop moves out during firing and jams slide	Stop retaining lips worn off	Replace stop
Gun won't fire when drawn from holster because slide is out of batter	Recoil spring too weak or too short	Replace
Gun feeds ball ok but not target or high performance loads	Rough or poorly shaped feed ramp	Polish or reshape ramp
Slide runs too far forward (rear of slide past rear of frame	Broken barrel link or cams	Replace link, check all else for damage

# **Magazine Troubleshooting**

Before I did any major work, I'd send it back to the factory...

\_\_\_\_\_

Tapping the back of the magazine against the palm of your hand helps to seat the cartridges. The top round should be angled up, and not be flat.

Do not shoot the gun with it rested on its magazine - it will jam.

To work on the feed lips without disassembling the magazine, push the follower down with the eraser on a pencil, then stick a nail or a pin through one of the "witness holes" to hold the follower down.

Magazines and firearm actions are made to be cycled at operating speeds, so the feeding of a firearm should always be checked at full speed, excepting the checking done on openbolt models. Any cycling of any firearm should always be done with non-firing dummy cartridges.

Most feeding failures that are magazine related can be attributed to lip failure or the magazine not being in the proper place.

\_\_\_\_\_

From the book: "Pistolsmithing" by George Nonte

The single-column, single-position feed consists of a sheet metal box. Its section is roughly the shape of the cartridge it is to handle and its dimensions slightly greater than the cartridge. Internally, the column of cartridges is pressed upwards against the feed lips by a follower. Pressure is provided by a follower spring, which is attached to either a fixed or removable magazine floor plate. To function properly, the spring and the follower must move freely, without undue friction through the body.

The spring must have sufficient force to hold the full column of cartridges against the underside of the feed lips at all times, particularly during recoil. For example, if recoil forces push the cartridges downward in the magazine, then the top cartridge may not be stripped from the magazine and chambered properly by the slide or bolt. Yet the spring must not be so powerful that it holds the cartridges too tightly against the feed lips. Excessive spring force will cause the top cartridge to bear too heavily against the slide or bolt, creating excessive friction that slows slide travel and may cause a short-recoil malfunction.

Thus, the magazine spring must be strong enough to hold the cartridges in position at all times, but not so strong that it creates excessive friction. The follower must hold the cartridges at the proper angle for feeding, but without producing excessive friction when the

### last cartridge is stripped.

### FEEDING MALFUNCTIONS AND CORRECTIONS

Feed lips are most likely to cause difficulties. If they are dented or bent, cartridges will not be held at the proper angle to be stripped and chambered. If feed lips are nicked or burred, this may dig into cartridge cases, causing undue friction which also prevents proper feeding. If severely bent, the lips may prevent the top cartridge from being caught by the slide or bolt at all, or may cause it to be stripped at an incorrect angle.

When the feed lips are spread too far apart at their forward edges, the cartridge nose will rise too high, resulting in a "cocked" round caught vertically between slide and breech. This may be corrected by squeezing the feed lips closer together at the front. In a well-worn magazine, the lips may be too weak to stay in the proper position and the magazine must be discarded.

This fault may also be caused by incorrect follower angle; that is, the front of the follower may be too high in relation to its rear, positioning the cartridge at too sharp and angle for proper feeding. This usually occurs only with sheet metal followers found in Colt/Browning designs and may be corrected by bending the follower to the proper angle.

When the front of the feed lips are squeezed too close together, or if the follower is bent with its rear too high in relation to its front, then the cartridge is jammed nose-down, with the bullet point rammed against the feed ramp. Corrections should be obvious.

When the top cartridge fails to raise high enough to be stripped from the magazine, feed lips may be deeply dented or, more likely, dents in the body are binding the follower. Dents in the magazine body, if not too severe, may be corrected by disassembling the magazine and filing away the inward protrusions. If the dents interfere only with the follower movement and not the cartridge movement, it may be simpler to file the follower's sides until it moves freely. (I don't recommend this because then if the follower goes bad, you have to file down the new follower, instead of just dropping a replacement in... Before I tried to do this, I would just send it back to the factory...) If the dents are more severe and will not even allow the cartridges to pass through the magazine body, then they can sometimes be removed by drilling or cutting them out of the magazine body.

Alternatively, a steel mandrel may be shaped to fit closely inside the magazine body, allowing the dents to be hammered sharply from the outside and flattened out. Sometimes this works and sometimes it doesn't; often the amount of hammering distorts and enlarges the magazine so that it will not enter the gun freely.

Dented, kinked, or broken springs will fail to elevate cartridges properly, particularly the last three or four rounds in the column. If in otherwise good condition, bent or kinked springs can be straightened by careful manipulation of two pairs of pliers on either side of the bend.

When the spring is too weak or perhaps too short to elevate all cartridges properly, it may

often be temporarily restored to proper function by stretching it. Alternatively, correct functioning with such a spring may sometimes be obtained by loading the magazine with one, two, or three fewer cartridges.

When magazine lips are badly distorted, it is often difficult to reshape them unless an undamaged magazine is available to use as a pattern.

While most magazine repairs are usually possible, you should keep a spare magazine or two for each pistol. Often magazines that appear to have been correctly repaired simply will not produce 100 percent feeding reliability and should be discarded.

Sometimes, magazines fit too tightly in their recesses in the gun, usually the result of minor bulges in the magazine body which do not otherwise affect functioning. They can easily be corrected by polishing or filing off the bulges, which are usually identified by scraping or rubbing marks. If no marks exist, smoke the magazine in a candle flame and insert and withdraw it to discover exactly where the binding occurs.

When a tight fitting magazine is encountered, you should not immediately assume, however, that it needs to be filed down. Sometimes grip screws protrude inside the magazine well and cause binding. Burrs inside the magazine well also cause the same problem, as can bent internal part.

Another problem, particularly with those magazines constructed of very thin metal, is excessive distortion of magazine-catch notches. When a magazine is worn at its catch notch, it slips downward in its well and may not elevate the cartridges high enough to be stripped properly. Such magazines are best replaced; however, they can be repaired by very careful welding up of the worn surface and then filing to fit. Ideally, the surface should be raised so that when the magazine is pressed fully into position the catch will just barely engage.

## JAMS

The stovepipe jam, the feed ramp jam, and the three-point jam are the most common jams in semi-autos. Other common jams include the failure to extract the empty shell, the slide not picking up the shell from the magazine and the cartridge dragging on the breech face.

In the stovepipe jam the empty case is caught between the slide and the chamber upright or sticking out to the side. These jams are often caused by the shell hitting the ejection port because of a port that is too small or the ejector not doing its job.

In the three-point jam, the bullet's upper front is caught against the top of the chamber with the lower middle of the case bearing against the lower mouth of the chamber, and the upper rim pressed against the breech face. One of its causes can be traced to the magazine not releasing the rear of the shell in the proper place to allow the shell to align with the chamber in time. Another cause of the three-point jam is related to proper throating of the chamber.

Proper ramp-to-throat transition is the real cure, but a good magazine follower design often lifts the front of the bullet over this interface, totally eliminating this confrontation. Improper seating of the barrel in the chamber nest in the top of the receiver can cause this jam, whether it is a three-point or slug to the rear of the chamber. Either jam is unrelated to the magazine.

If the three-point jam doesn't respond to other treatment, the rear of the shell may be contained too far forward so that the rear of the shell is held down when the slug strikes the top and the throat of the chamber causes a three-point jam. If it is always the last shell, then look into changing the follower to a rounded-top type so that the last shell's rear is kicked up the same as if it were being raised up by another shell.

If the cartridge is getting jammed against the breech face and the middle of the case isn't hitting against the throat of the chamber, then the likely cause is the bullet dragging against the breech face. The rear of the rim of the cartridge case must travel up the breech face as the slide is pushing the shell forward, so the surface finish of the breech face is important to the smooth transition of the rim against the slide. This is more common in the smaller calibers, although it is also found with the larger ones, too.

This kind of jam can be caused by the rim of the shell getting stopped by either the surface roughness of the breech face or an extrusion around the firing pin hole. Either on can be remedied with an abrasive stone and neither of them is related to any fault of the magazine construction or design.

### **Other Failures**

Failure to extract, another common cause of jamming, can usually be traced to either a rough chamber or a problem with the extractor or extractor spring – problems not related to the magazine. Check the angle of the underface of the extractor by looking at it while it is extracting, or if this is not possible, hook a case onto it and feel how well the extractor holds onto it. The angle often needs to be sharpened to slightly more than 90 degrees. A simple pull on the extractor's hook will give you an idea if the spring is stout enough.

The extractor should have a surprising amount of force, but needs to be moved easily enough to allow the extractor to be cammed over the rim of the shell with the recoil spring alone.

When the slide misses the top cartridge, which is not really a jam, the cause can be traced to the magazine being lower than proper, among other problems.

(Make sure it is inserted all the way!) The positioning of the magazine is dictated by whatever mechanism or physical feature is employed to hold the magazine in the firearm. The holding scheme directly affects the magazine's positioning. Be it the bottom of the magazine or a notch in the side of the magazine, if the magazine is too low, something must be added to the magazine to make it come into place.

A good piece of spring wire, or even a good guitar string silver soldered into place, will cure most improperly cut or wallowed edges of magazine notches. Just cut a short length of wire of the proper diameter, and silver solder it into the notch or onto the bottom of the magazine to shim the magazine up into the proper place.

If the magazine is seated properly, then the rear of the magazine is most likely at fault. Bending the rear of the mag lips should be approached cautiously, as some magazines have rolled-over rear tops that just cannot be easily bent into a higher configuration. If the construction of the rear of the magazine's mouth can be bent such that the rear of the cartridge is allowed to seat higher, then some duck-billed pliers are exactly the thing to bend the lips wider apart. Care must be exercised to keep the top or the magazine from dragging on, or interfering with, the slide's bottom.
## Tips from the HiPoint forum

#### **Feed Ramp Polishing**

By "Needforspeed3685" on HiPoint forums

#### How-To: Polish the Feed Ramp

Hi-Point C9 9mm Compact (works for others)

#### Materials Needed:



- Dremel with polishing discs including at least one cone-shaped tip (the flex-shaft, used here, really makes this a lot easier!)
- Red jeweler's compound or low-grit polishing compound
- Extra rags, an old t-shirt, or something to seperate the gun and work surface to catch the excess polish compound
- Q-Tips (not pictured)
- Gun Solvent and oil (CLP and Outer's products shown)
- 3/32" pin punch, or ice pick, or if you can't find anything else, the allen wrench included with the gun for sight adjustment fits perfectly!

Begin by removing the slide. Always follow the manufacturer's instructions for doing this, and always **ALWAYS MAKE SURE THE GUN IS UNLOADED**. Check the chamber twice, save your life.

#### After the slide is off, you'll have much better access to the feed ramp. The feed ramp is the small inclined plane that the nose of a bullet slides against when entering the chamber.

As you can see in this picture, the black finish began chipping off the feed ramp on mine after 1500 rounds. At this point, you might as well polish the feed ramp, as the small deviation between the finished and unfinished surfaces will cause a round to "hang-up" in the chamber and not feed properly.



Begin with the Dremel on it's lowest speed setting. This is somewhere around 5000 RPM's, and is more than sufficient to begin the polishing process. Apply compound to the polish tip and polish the feed ramp with constant movement, as to prevent and low spots. As the ramp is polished some and the compound begins to work, you can up the speed to 1/2 to 3/4 power. I found that full speed only slung compound everywhere instead of actually polishing.

Once the feed ramp is covered with a layer of compound (which will turn black when used)

wipe it down with a rag sprayed with a shot of CLP. This will quickly remove the polish and reveal any spots you may need to go back over once more.

Here you can see the middle is fairly polished, but the sides are still coated and need more work:



While you have the slide removed, you should consider running a Q-Tip chucked in the Dremel up the firing pin channel. This area is victim to the same surface finish chipping problem, and will clean up well with a few passes with a rotating Q-Tip.

Once you have everything removed from the feed ramp, it's time to CLEAN CLEAN CLEAN! As you can see, the polish compound really goes everywhere, including down the barrell.



Wipe the feed ramp down with rag or cotton patch dipped in Gun & Reel Oil or equivalent to prevent any rust from showing up. Make sure this coat is VERY light.

I noticed a huge difference when I did this to my C9. It now chambers rounds more smoothly and quickly, and I don't have to manually rack the first round. I simply touch the back of the slide and it does the rest!

#### **Magazine Polishing**

By "1inthechamber" on HiPoint forum

Keeping with the theme of my polished slide, I went ahead and polished my magazines. These pics were from my scanner, looks alot better in person, especially when the light hits it just right.

- 320 grit sandpaper
- 400 grit sandpaper
- Small flathead screwdriver
- A cleaner such as Break-Free CLP
- Q-Tips
- Tissues or an old shirt (to wipe dirt off)

Step 1: I took the small flathead screwdriver and inserted the head between the plastic base and metal on the bottom of the magazine. Pushed it down, flipped it over while still holding the other side (so it doesn't reattach itself (the tab will 'pop' back in the hole) and pop the other side out.

Step 2: Carefully slide the floorplate down along with the spring and follower. Make sure you remember exactly how it was put together. I placed all the parts to the side together organized so I know how to reassemble it.

Step 3: Take the 320 grit sandpaper and start stripping off the black until it becomes shiny. Some parts will be tougher to get all shiny, such as the back of the magazine (flat part where the 'zig zags' meet).

Step 4: Take the 400 grit and 'rub' until a desired finish.

Step 5: Clean the inside and outside with Break-Free CLP or other cleaner using Q-Tips/tissues.

Step 6: Apply a thin layer of gun oil.

Step 7: You can repeat the sanding process if you like before you clean and put the magazine together.

Step 8: If you forgot how your magazine was put together, take the spring and place the 'hook' around the 'stub' inside the floorplate. At this point the spring should be leaning 'forward', place the follower ontop of the spring, hold the floorplate and spring together and slide it in the magazine body. Once you have all components inside the magazine body, press firmly on the bottom of the floorplate until you hear it 'snap' back into place. Make sure the follower is seated correctly.

Once you get the hang of taking apart and putting together your magazine(s), it will make it easier to clean the inside whenever you wish.



#### **Magazine Feed Lip Sanding**

By "Needforspeed3685" on HiPoint forums

Well, I fully modified 2 of my 3 magazines this weekend. I emulated a R&R process I use at work to study the changes created by each point of modification, and used the best combination of results for the second magazine. I then test-fired using the all new Wolf FMJ's and studied the differences between the 3 magazines. Here are the results: **Please note I'll be posting a full thread with process pictures and results soon, for those that want more info on what exactly I did.** 

Supplies used:

- New, EXPO #2 wood pencil
- 7/16's open-end wrench





Compressed air & CLP

The first obstacle in modifying the magazine will most always be the follower. Definition for "follower": A metal piece inside the magazine that forces the cartridges upwards against the feed guides (lips) via a spring.

Since this is spring-loaded, it's hard to hold the follower down and out of the way while

filing, so I used the eraser-end of a wood pencil to push the follower down just below the hole on the left side of the magazine, then inserted one "claw" of the open-end wrench in this hole to hold the follower in place.

Using an increasing diameter round file I filed in the direction a round will travel when exiting the magazine. Filing all surfaces made enough chamfer on the magazine guide lips to aid in pushing the round out easily.

Before I did this I had to "slam" or push the slide forward to chamber the first round of each magazine, and some consecutive rounds thereafter. Round chambering was slow when cycling the gun and mis-feeds were prominant.

Now the slide moves forward quickly with a dominating "thud" as the first round is moved from magazine to chamber. General action of racking the slide is better and faster, and cycling the gun is much smoother!

I'm VERY impressed with the results, as it's given me a new-found confidence in my C9 as more than just a plinker!

#### Slide won't return forward

By "rimfirehunter" on HiPoint forums

Picture one shows what the hold open slot looks like inside the slide, it is NOT engaged by the hold open.



Picture two shows what it will look like when it IS engaged by the last round hold open.



Picture three shows where the hold open spring is located and how it SHOULD look.



If the spring is weak, improperly installed or damaged this could cause the hold open not to disengage after the magazine is removed and the slide retracted and let go.

A few other things could cause this, but for now this is the first place I would have a look at. If anything looks out of place, damaged or missing then contact Beemiller or MKS directly.

# HOLSTERS

#### Holster and Magazine Pouches

Holster, magazine pouches and ancillary equipment should be inspected regularly to assure serviceability. Inspect for:

- 1. Safety/retention devices that retain and release correctly (snaps, velcro or inserts).
- 2. Accumulation of lint, dirt, oil, or other foreign material.
- 3. Overall appearance and shape, inside and outside.
- 4. Moisture build up.

**NOTE:** Separate pistol from the holster and magazines from the pouch regularly. This will help the holster and pouch to dry out and not trap moisture. This also provides an opportunity for regular visual inspection.

You should use the air hose here (dry air) to blow out pouches and holster. A clean dry cloth would be sufficient when compressed air is unavailable.

HiPoint Vega holster fits all

http://www.impactguns.com/store/752334341501.html

.380

Bianchi 7001 & 7115 Vega N150 Uncle Mike's #16 Uncle Mike's #10 IWB ambidextrous Fobus HP2

9mm

#### C9 Compact

Bianchi 7001 & 7115 Vega N150 Uncle Mike's #16 Uncle Mike's #10 IWB ambidextrous Fobus HP2 Concealment Concepts #202C Concealment Concepts #203 Gunmate Size 12 (tight fit)

#### NOTES:\_\_\_\_\_

.45

## Parts Diagrams

#### Stallard Arms Model JS-9MM



Click Schematic to enlarge or print NI=Not Illustrated

Click on column header to change sort order.

Note: The "On-Line Viewable Schematics" providen this site are to be used as a general reference to assist you in identifying parts and may not be an illustration of your <u>EXACT</u> model.

<u>Key</u> <u>Number</u>	ltem Number	Description
<u>1</u>	<u>235440</u>	Ejection Pin
<u>2</u>	<u>235450</u>	Ejection Key
<u>3</u>	<u>235460</u>	Ejection Spring*
<u>4</u>	<u>235660</u>	Slide W/ Pin, 9MM, NI
<u>5</u>	<u>235470</u>	Firing Pin
<u>6</u>	<u>235490</u>	Firing Pin Spring
<u>7A</u>	<u>235670A</u>	Slide Retainer, 9MM
<u>8</u>	<u>235500</u>	Slide Retainer Pin*
<u>9</u>	<u>235550</u>	Sear Spring
<u>10</u>	<u>235560</u>	Sear Cam

<u>11</u>	<u>235570</u>	Sear Assembly
<u>12</u>	<u>235580</u>	Safety
<u>13</u>	<u>235680</u>	Frame, 9MM (FFL Req'd)*
<u>14</u>	<u>235590</u>	Recoil Spring
<u>15</u>	<u>235600</u>	Trigger Pin
<u>16</u>	<u>235620</u>	Trigger Assembly
<u>17</u>	235690	Grip Screw, 9MM (2 Req'd)
<u>18</u>	<u>235700</u>	<u>Grips, 9MM, NI</u>
<u>19</u>	<u>235630</u>	Magazine Catch*
<u>20</u>	<u>235650</u>	Magazine Catch Pin*
<u>21</u>	<u>239720</u>	Magazine, 9MM, 9 Round, NI*
<u>NI</u>	<u>235720</u>	Barrel Pin, 9MM, NI
<u>NI</u>	<u>235710</u>	Barrel, 9MM, NI

NI = Not Illustrated \* = Click on part. There is additional information such as FFL Req'd, Low in Stock, Out of Stock, etc...



#### HiPoint C9 (9mm) and CF (.380 ACP)

# PARTS LIST FOR MODEL C9-9MM OR CF 380-380 A.C.P.

Ejection Pin

Grip Screw (2)

Cirilo (C)

ත් ස් Ŕ

- Ejection Key  $\rightarrow ci$
- Ejection Spring Slide
  - Firing Pin र्च wij.

Sear Block Spring

Scar Block

- Firing Pin Spring ŵ.
- Firing Pin Spring Cup
  - Slide Retainer ෂ ඡ ල්

Counter Weight

ដងដង់ងង់ងង់ងំងំងំងំងំ

- Slide Retainer Pin
- Sear Spring
- Sear Assembly Scar Cam ÷ e (

Sight Pivot Screw Elevation Screw

- Safety  $\underline{\underline{c}}_{\underline{i}}^{\mu}$
- Frame ź
- Recoil Spring  $\underline{w}_{1}^{i}$
- Recoil Spring Guide Rod 설

  - Trigger Assembly Trigger Pin  $\underline{r} \leq \underline{s} \leq$
- Magazine Lockout Spring  $\mathbf{\hat{z}}$

Magazine Lockout

Hold Open Spring

킜

Hold Open Fin

볋

Hold Open

 $\tilde{m}$ 

To order extra magazine send money order for \$15.00 per magazine (includes shipping & handling) to: Beemiller Inc., 1015 Springmill Road, Mansfield OH 44906

Visa and MasterCard accepted.

# Prices available upon request.

Changes in design may occur from time to time. Always specify the serial number of your pistol with your inquiry.

# Care and Use / Maintenance

chamber, and barred inspection and cleaning is easily performed in this position. Barrel should be brushed every 300 - 400 rounds. Complete disuscently and cleaning should be performed at 1500 2000 rounds. Slide can be locked open by moving slide to rearmost position and at this time pushing safety lever up into the notch in the slide. Breech, DISASSEMBLY

Pistol must be unloaded to perform disassembly. Move slide to rearmost retainer pin from frame. Lift slide up until it stops. Hold rear of slide up and push forward: this removes slide assembly from frame. Reassemble position, exposing slide retainer pin. Using a 1/8" pin punch, remove by reversing disassembly procedure.

#### HiPoint C9 (9mm) and CF (.380 ACP) with Compensator

#### PARTS LIST FOR MODEL C-9MM OR CF 380 A.C.P. COMP

FARIS LIST FOR	MODEL C-9M
1. Ejection Pin	17. Grip Screw (2)
2. Ejection Key	18. Grip (2)
3. Ejection Spring	19. Magazine Catch
4. Slide	Assembly
5. Firing Pin	20. 8 Shot Magazin
6. Firing Pin Spring	Assembly
<ol><li>Slide Retainer</li></ol>	21. Sear Block Spri
<ol><li>Slide Retainer Pin</li></ol>	22. Sear Block
<ol><li>Sear Spring</li></ol>	23. Counter Weight
10. Sear Cam	Pivot Pin
<ol> <li>Sear Assembly</li> </ol>	24. Counter Weight
12. Safety	25. Magazine Catch
13. Frame	26. Adjustable Rear
14. Recoil Spring	Sight Assembly
15. Trigger Pin	27. Elevation Screw

2)	Sight Spring
ine Catch	30. Adjustment Tool
bly	31. Compensator
Magazine	32. Compensator Screw
bly	33. Compensator Nut
lock Spring	34. Hold Open Pin
lock	35. Hold Open
r Weight	36. Hold Open Spring
'n	37. Magazine Lockout
r Weight	38. Magazine Lockout
ine Catch Spring	Spring
able Rear	39. 10 Shot Magazine

- 0 Shot Magazine Assembly
  - 40. Compensator Allen Key

29. Adjustable

16. Trigger Assembly

28. Sight Pivot Screw

#### To order extra magazine send money order per magazine to: Beemiller Inc., 1015 Springmill Road, Mansfield, OH 44906

8 Shot Magazine	\$15.00 (includes shipping & handling)	
10 Shot Magazine	\$18.00 (includes shipping & handling)	

Visa and Mastercard accepted

Prices available upon request. Changes in design may occur from time to time. Always specify the serial number of your pistol with your inquiry.

#### Care and Use/Maintenance

Slide can be locked open by moving slide to rearmost position and at this time pushing safety lever up into the notch in the slide. Breech, chamber, and barrel inspection and cleaning is easily performed in this position. Barrel should be brushed every 300 - 400 rounds. Complete disassembly and cleaning should be performed at 1500 - 2000 rounds.

#### DISASSEMBLY

Pistol must be unloaded to perform disassembly. Remove compensator then move slide to rearmost position, exposing slide retainer pin. Using a 1/8" pin punch, remove retainer pin from frame. Lift slide up until it stops. Hold rear of slide up and push forward; this removes slide assembly from frame. Reassemble by reversing disassembly procedure.

Compensator may need to be re-tightened after use. Do not overtighten.

Compensated pistols are louder and more likely to deflect gases and debris back onto the shooter; so it is IMPERATIVE that ear protection and eye protection are worn with the C-9MM or CF 380 A.C.P. Comp pistol.



#### Hi-Point Model JC .40 S&W

#### PARTS LIST FOR MODEL JC 40 S&W

- 1. Ejection Pin
- 2. Ejection Key
- 3. Ejection Spring
- 4. Slide
- 5. Firing Pin
- 6. Firing Pin Spring
- 7. Slide Retainer
- 8. Slide Retainer Pin
- 9. Sear Spring
- 10. Scar Cam
- 11. Sear Assembly
- 12. Safety
- 13. Frame

- 14. Recoil Spring
- 15. Trigger Pin
- 16. Trigger Assembly
- 17. Grip Screw (2)
- 18. Grip (2)
- 19. Magazine Catch
- 20. Magazine Catch Spring
- 21. Magazine Assembly
- 22. Counterweight Hold Pin
- 23. Counterweight Pivot Pin
- 24. Counterweight
- 25. Sear Block
- 26 Sear Block Spring

#### Contact your local dealer for parts inquiry.

To order extra magazines, send a \$15 money order (includes shipping & handling) per magazine to: Iberia Firearms Inc., 3929 State Route 309, Galion, Ohio 44833-9401.

Prices available upon request. Changes in design may occur from time to time. Always specify the serial number of your pistol with your inquiry.



HiPoint Model JCP .40 S&W



Stallard Arms Model JS-45

Click Schematic to enlarge or print NI=Not Illustrated

Click on column header to change sort order.

Note: The "On-Line Viewable Schematics" provided on this site are to be used as a general reference to assist you in identifying parts and may not be an illustration of your <u>EXACT</u> model.

<u>Key</u> <u>Number</u>	ltem Number	<u>Description</u>
<u>1</u>	<u>235440</u>	Ejection Pin
<u>2</u>	<u>235450</u>	Ejection Key
<u>3</u>	<u>235460</u>	Ejection Spring*
<u>4</u>	<u>235730</u>	Slide W/ Pin, .45 Cal.
<u>5</u>	<u>235470</u>	Firing Pin
<u>6</u>	<u>235490</u>	Firing Pin Spring
<u>7</u>	<u>235740</u>	Slide Retainer, .45 Cal.
<u>8</u>	<u>235500</u>	Slide Retainer Pin*
<u>9</u>	<u>235550</u>	Sear Spring
<u>10</u>	<u>235560</u>	Sear Cam

<u>11</u>	235570	Sear Assembly
<u>12</u>	<u>235580</u>	Safety
<u>13</u>	<u>235750</u>	Frame, .45 Cal. (FFL Req'd)*
<u>14</u>	235590	Recoil Spring
<u>15</u>	<u>235600</u>	Trigger Pin
<u>16</u>	<u>235620</u>	Trigger Assembly
<u>17</u>	235760	Grip Screw, .45 Cal. (2 Req'd)
<u>18</u>	<u>235770</u>	<u>Grips, .45 Cal.</u>
<u>19</u>	<u>235630</u>	Magazine Catch*
<u>20</u>	235650	Magazine Catch Pin*
<u>21</u>	<u>235790</u>	Magazine, .45 Cal., 7 Round
<u>22</u>	<u>235810</u>	Counter Weight Hold Pin, .45 Cal.
<u>23</u>	235820	Counter Weight Pivot Pin, .45 Cal.
<u>24</u>	235830	Counter Weight, .45 Cal.
<u>NI</u>	235860	Barrel Pin, .45 Cal., NI
<u>NI</u>	<u>235850</u>	Barrel, .45 Cal., NI
<u>NI</u>	<u>235870</u>	Safety Slide Lock, .45 Cal., NI

NI = Not Illustrated \* = Click on part. There is additional information such as FFL Req'd, Low in Stock, Out of Stock, etc...

#### **HiPoint Model JH .45 ACP**

#### PARTS LIST FOR MODEL JH 45 ACP

- L. Ejection Pin
- 2. Ejection Key
- 3. Ejection Spring
- 4. Slide
- 5. Firing Pin
- 6. Firing Pin Spring
- 7. Slide Retainer
- 8. Slide Retainer Pin
- 9. Sear Spring
- 10. Sear Cam
- 11. Sear Assembly
- 12. Safety
- 13. Frame

- 14. Recoil Spring
- 15. Trigger Pin
- 16. Trigger Assembly
- 17. Grip Screw (2)
- 18. Grip (2)
- 19. Magazine Catch
- 20. Magazine Catch Spring
- 21. Magazine Assembly
- 22. Counterweight Hold Pin
- 23. Counterweight Pivot Pin-
- 24. Counterweight
- 25. Sear Block
- 26 Sear Block Spring

#### Contact your local dealer for parts inquiry

To order extra magazines, send a \$15 money order (includes shipping & handling) per magazine to: Haskell Manufacturing Inc., 585 East Blue Lick Road, Lima, Ohio 45801.

Prices available upon request. Changes in design may occur from time to time. Always specify the serial number of your pistol with your inquiry.



HiPoint Model JHP .45 ACP

Inside the .45



Left Side

**Right Side** 



Top view

## WEBSITES

#### NOTE: Some of these websites, I **DO NOT** and **WILL NOT** support as a whole, but they mention HiPoints.

General Information

\* www.mkssupply.com

- \* www.hi-pointfirearms.com
- \* http://www.sigarmsacademy.com/pdf/preventative\_maintenance\_guide.pdf

\* "Gunsmith's Creation now infamous; maker of rifle used in massacre feels pride, pain".

- Walsh, Sharon. The Washington Post. Washington: Apr 30, 1999. pg. E01.
- \* www.impactguns.com/store/hipoint.html
- \* www.promagindustries.com/highpoin.asp
- \* www.doingfreedom.com/gen/0103/bargainpistols.html
- \* www.amfire.com/php/container.php?content=newsPost.php&newsPostID=124
- \* "Complete guide to compact handguns". Gangarosa, Gene. p. 240-1. ISBN: 0-88317-203-8
- \* www.vpc.org/studies/deadhip.htm

Model CF .380

\* www.mkssupply.com/handgun\_details.asp?Gun=380comp

Model C9

- \* www.securityarms.com/20010315/galleryfiles/2500/2563.htm
- \* http://www.gunboards.com/forums/topic.asp?TOPIC\_ID=34845 Model A
- \* www.geocities.com/SunsetStrip/5449/fireoverhp.htm?200528 Model B
- \* www.geocities.com/SunsetStrip/5449/fireoverhp.htm?200529

#### JC 40 S&W

- \* www.securityarms.com/20010315/galleryfiles/2900/2963.htm
- \* www.mkssupply.com/handgun\_details.asp?Gun=40SW
- \* www.michiganmilitia.com/SMVM/weapons/hipoint40.htm

Handgun Drills/ Troubleshooting

- \* www.kuci.org/~dany/firearms/all\_drills.html
- \* www.sightm1911.com/lib/tech/FTF\_FTE.htm
- \* "The same But different?" Clint Smith. American Handgunner 2006 Tactical Annual.

Model JHP .45 ACP

- \* www.mkssupply.com/handgun\_details.asp?Gun=45ACP
- \* www.defensereview.com/modules.php?name=Reviews&rop=showcontent&id=80
- \* www.shootingtimes.com/handgun\_reviews/hipoint\_100605/index.html

Gunsmithing

\* "Magazine Repair and Lip-shaping". Practical Gunsmithing. P. 69-75. ISBN: 0-87349-187-4.

\* http://img.photobucket.com/albums/v151/wolf\_from\_wv/9.jpg
 \* http://img.photobucket.com/albums/v151/wolf\_from\_wv/chamber\_reamer.jpg

\* http://img.photobucket.com/albums/v151/wolf\_from\_wv/9mm\_measurements.jpg

#### NOTES:\_\_\_\_\_

NOTES:	