



# Ruger 77/50 209 Conversion Users: Start Here!!!!


Thank you for your purchase! The first thing you should do is read/review the Ruger 77/50 Owner's manual. A copy is available at [www.BadgerRidgeInd.com](http://www.BadgerRidgeInd.com). Then using the Ruger Owner Manual's procedures, ensure the rifle is on safe and unloaded, and **tear down the rifle to clean every nook and cranny. Especially the area of the receiver concealed by the stock that has a large hole that allowed blow-back to get underneath the receiver.** The old system got crud everywhere, clean it up now and have some peace of mind. Be sure to clean those breech threads!!!!

After fully reading and understanding the Ruger Owner's manual, completing a good tear down and cleaning, you can then follow these instructions. REMEMBER: DO NOT USE A LETTER C BIT ON YOUR RUGER's BREECH PLUG (only Remington Kits use the C bit method)!

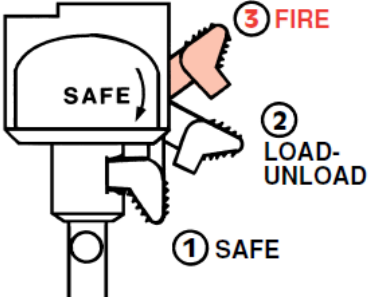
The Ruger 77/50 kit uses a similar but significantly different breech plug than our Remington 700 kit. **You do not 'tune' the 77/50 breech plug with a letter C bit.** Our 77/50 kit is designed to lightly crush the primer in order to seal the breech. 77/50 owners must ignore any directions (for the Remington) about tuning with a letter C bit, and instead must follow the directions below in order to choose primers that headspace properly for a proper seal.

**Ensure the rifle is unloaded before working on it. You must ensure it is not charged, and not primed. Read and follow all safety instructions in the Ruger 77/50 Owner's Manual before handling your firearm.**

**Read and understand the rifle's Owner's Manual and powder manufacturer's instructions prior to using our conversion kit.** Using our 209 conversion replaces the breech plug; apply what the Owner's Manual says about nipples, flash holes, & caps to flash channels, vent liners, & 209 primers.



## WARNING – MANUAL SAFETY



**3 FIRE**  
**2 LOAD-UNLOAD**  
**1 SAFE**

Keep the safety on unless actually firing. Always move the safety fully to its intended position and check it. The safety has three positions –“SAFE,” “LOAD-UNLOAD,” and “FIRE.” Never depend on a safety mechanism or any other mechanical device to justify careless handling or permitting the rifle to point in an unsafe direction. The only “safe” rifle is one in which the bolt is open, the barrel is empty of both powder and projectile, and the nipple is uncapped.

**KNOW HOW TO USE THE SAFETY**

## HOW TO SET UP YOUR RIFLE WITH IT'S 209 MODIFIED BOLT:

1. Per the owner's manual, function check the safety, ensure that the rifle will not discharge with the safety engaged in neither the "Safe (bolt locked)" nor "Load/Unload - Middle" position.
2. Per the owner's manual, remove the bolt and breech plug. Discard the original breech plug and only use the Badger Ridge breech plug with the 209 converted bolt.
3. Clean the breech threads; ensure they are free of any contaminants. A 20 Ga bore brush works well.
4. Ensure the breech plug is CLEAN & DRY.
5. Install the 209 conversion kit's breech plug (ensure it is fully seated) & the 209 converted bolt installed per the owner's manual. A 7/16" 12 point socket on an extension is required to firmly snug the breech plug into the breech.
6. WITHOUT a primer in the nose of the bolt, when closing the bolt, it should just fall down into the closed position without any resistance. Dry fire, and ensure there is no contact on the bolt to the breech plug. If the bolt contacts the breech plug, remove bolt and breech plug and clean the breech threads (go back to step 2 above). Using a sharpie or dry erase marker on the nose of the bolt can aid in determining if there is any binding. Usually binding is caused because the breech plug not fully seated due to contaminants in the breech threads. Do not continue past step 6 until sure there is no contact between the bolt and the breech plug (IE the breech plug is fully seated into the breech).
7. Note the feel of the bolt closing without a primer, & without binding. In the following steps, you will need to note whether you are crushing primers by the increase in the resistance of closing the bolt.

**WARNING: Over crushing primers can cause a discharge! Light hand pressure is all that should be used to close the bolt! Whenever priming, be ready for the rifle to fire (ensure it's in a safe area to discharge primers, unloaded, and pointed in a safe direction when performing these procedures). The goal is just to have the primer barely crush. Only a little crush (three to five thousandths of an inch) is required to seal the breech. Anything more is dangerous, and could cause inadvertent discharge! Once you crush a primer, set it aside as it has been permanently deformed. Re using crushed primers can cause blow by leakage.**

Note: 209 Primers will vary in dimensions between manufactures, and to small extent within the same box! Winchesters tend to be the longest. CCI and Federal and are about .005" shorter than Winchester. You may find that you cannot close your bolt on Winchester primers because they are so long. If having trouble with Winchesters, switch to CCI or Federal. Also, magnum primers may be a better choice to ignite Blackhorn209 better in extreme cold.

8. Ensure the rifle's safety is on the middle position (Load/Unload), the rifle is unloaded and pointed in a safe direction: install a primer in the nose of the bolt and attempt to close the bolt.

8a. If the bolt handle falls to the bottom without any resistance (ie no light crush to the primer)" swap to a longer primer. See note on page 2.

8b. If you encounter *some* resistance as the primer crushes when closing the bolt, the headspace is correct: That brand of primer will seal your breech. Remember the different feel when closing the bolt with a primer in the nose will be apparent if it is sealing with a light crush. You may be able to see this crush by closely examining a crushed primer, or placing it next to a virgin primer. (see note 1 & note 2 below)

8c. If the handle will not close on the primer, your primer is too long. **Do not force a closure by striking the bolt handle or you may inadvertently fire the primer!** Remedy by: Making sure the breech is clear of contaminants and plug is fully seated -- Try a brand of primer that is shorter.

**Note 1: Once a primer is crushed and removed it is permanently slightly deformed; it won't crush with the same feel if it is used a second time.** Reusing an already crushed primer may not seal well when igniting a powder charge.

**Note 2: Helpful hint:** If you have calipers you can measure your primers virgin length, then measure how long it is after it's been 'crushed'. The measurement isn't exact as they spring back a little.

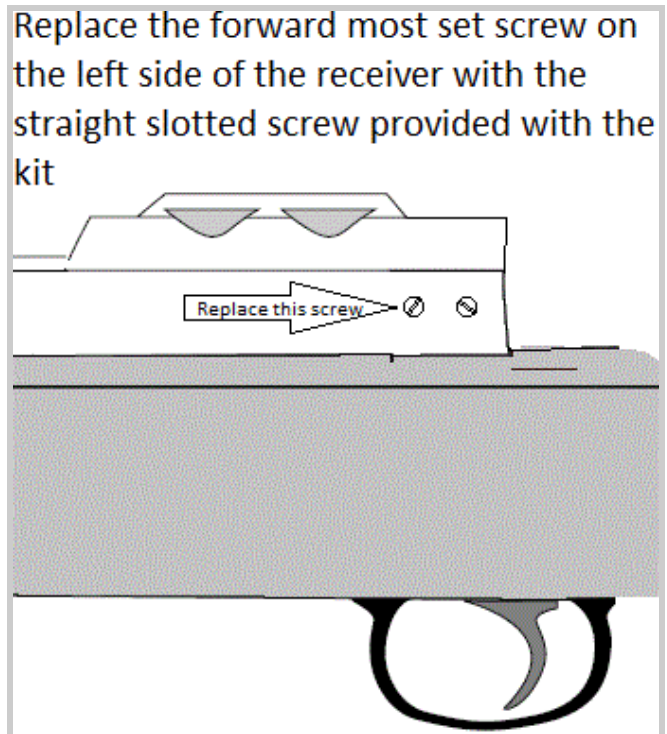
**Note 3:** If you have to use Winchester primers, and the bolt won't safely close on them, and you are 100% sure your breech threads are clean and the breech plug is fully seated, please contact Badger Ridge, we can change the headspacing of the bolt. If the bolt won't seal on primers because they are too short, contact Badger Ridge for shims.

## Stop bolt retraction in loading window:

18. Once the bolt is installed, and your breech plug is getting a proper crush on your primers, replace the forward most set screw on the left side of the receiver with the straight slotted screw provided with the kit. This will stop bolt retraction with the nose in the loading port, and facilitate easier insertion and removal of primers into the bolt nose. You will have to back the longer straight slot screw out in order to remove the bolt.

My contact info is below. Feel free to contact me!

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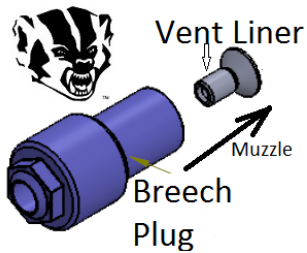
### **USE of Ruger 77/50 bolt modified with Badger Ridge 209 Conversion Kit**

Prior to executing these instructions ensure the bolt nose conversion has been headspaced by choosing the proper primers (Pages 1-3 above)

**1: Ensure the rifle is on “Safe: Load/Unload”, deprimed, and unloaded prior to working on it.**

2: Per the Owner’s Manual (a copy is available at www.BadgerRidgeInd.com) remove the old breech plug and discard. **The modified bolt will not work with the original breech plug.**

3: **Clean the rifle and ensure the breech threads are clean and free of debris.** (A 20GA bore brush is useful in cleaning breech threads)



4: Place a very small amount of anti-seize grease on vent liner’s threads and thread into Badger Ridge breech plug. Snug with 7/64 hex wrench & finger pressure. Ensure no anti-seize is on breech plug face nor in the flash chamber or channel of the vent liner.

5: Place the breech plug into the action with the vent liner towards the muzzle and slide forward towards breech. Apply a small amount of anti-seize to first few threads of the breech plug being careful not to get any on the breech face nor in the primer pocket nor flash channel. Alternately, some use teflon tape on the breech plug threads. If you teflon tape instead of anti seize, only use one or two wraps: more can back the breech plug out, causing a headspace issue.

6: Move the breech plug into the breech & thread into the breech with finger pressure only. Once gently started, torque breech plug into breech per the Owner’s Manual with a 7/16 socket on an extension.

7. Place bolt into action, and affix bolt screw. **Before using the rifle, make sure the bolt closes smoothly on an empty breech plug.** If it engages the breech plug and or otherwise does not close smoothly, the breech plug may not be safely and fully seated into the breech!!! This must be rectified before using the rifle or feeding primers! Typically this is due to contaminants in the breech threads. (see step 3 above)

**Beware: Anti-seize in the flash channel or breech face can cause hang or misfires.**

**WARNING: Failure to properly clean and assemble, recognize or correct a deficiency in any component of the rifle can kill, maim, injure, or damage property. Never shoot the rifle without a vent liner in the breech plug! Never use smokeless powder in your muzzleloader!**

*Note: 209 shotshell primer dimensions vary slightly between manufacturers. Once you set headspace by choosing a primer brand, or shimming you must ensure you are using the same brand and depth of shims, or you may have headspace issues. Excessive headspace can cause blow back to flow around the primer.*

**Breech plug maintenance:** After firing 209 primers, burnt priming compound will coat the flash chamber & the flash hole of the Vent Liner. To clean: remove the breech plug & ream the flash chamber gently with a drill bit that fits in the breech plug loosely (1/8” works well). DO NOT REMOVE METAL! Pipe cleaners work well too. Use torch tip cleaners to clean the vent liner. Scrub & remove all fouling with the appropriate solvents, & place anti seize on all breech plug/vent liner threads before using the breech plug. Eventually the vent liner will wear out; it should be replaced when it’s interior has opened to .036” or accuracy will suffer. Openings beyond .036 can deliver excessive pressure to the primer. **Always use a vent liner in the breech plug, or you may see excessive/unsafe pressures at the primer!!!**

**DO NOT STORE YOUR RIFLE WITH THE BREECH PLUG INSTALLED, CHARGED, UNCLEANED, NOR UNPROTECTED BY GUN OIL OR BORE BUTTER.** Even the high quality 416 stainless your Badger Ridge 209 conversion kit is made out of will corrode if not properly cared for. Remember all black powder and substitutes promote corrosion! Blackhorn 209 cleans up with standard gun cleaning products (Hoppe’s #9 and gun oil), while all other black powder substitutes typically require organic cleaning solvents (Windex, soap, water) and organic oils/pastes (Bore butter).

## TROUBLESHOOTING AND COMMON MISTAKES

**Read and understand the rifle's Owner's Manual and powder manufacturer's instructions prior to using our conversion kit.** Using our 209 conversion replaces the breech plug; apply what the Owner's Manual says about nipples, flash holes, & caps to flash channels, vent liners, & 209 primers.

Troubleshooting & good directions are also in the Owner's Manual & your powder manufacturer's instructions.

**Failure to Fire, Misfires, Hang-Fires, Bloopers, etc.** Typically these are caused by one or a combination of:

1. Poorly installed conversion (not cleaning breech threads) or weak mainspring
2. Improper maintenance: Obstructions/contaminants in the flash chamber or barrel, using lube that gels in cold
3. Using reduced power (ie "black powder", "Pyrodex" or "777") primers with Blackhorn209 powder.
4. Failure to seal and compact the charge, especially when using Blackhorn209 powder.

New Ruger 77/50 mainsprings are next to impossible to find, thus the mainspring could not be replaced during conversion. As the original system tended to overstress the mainspring and subject it to corrosion, as your conversion ages light and inconsistent primer strikes are probable. Also if the cross pin protrudes, or there is a bur causing the firing pin to hang up, etc: failures to fire are probable. Take the rifle to a competent gunsmith with these instructions, or contact Badger Ridge to remedy any abnormal or unsafe condition.

### **Remedies for obstructions or contaminants in the flash chamber/improper maintenance:**

Clean the flash channel of the breech plug with a 1/8 drill bit (use fingers only, no drills! Do not remove metal!!!) Use appropriate bore cleaning solvents to dissolve & remove any remaining contaminants. Clean the flash channel of the vent liner with torch tip cleaners. Remove any lubricants, greases, or oils in the flash channel prior to loading. The flash path must be clear, dry, and free of any lubricants!

- Keep anti-seize only on the threads of the breech plug and vent liner; anti-seize or any other lubricant will reduce primer heat and cause ignition problems when in the flash chamber, or face of the breech plug.
- Use a clean dry patch to swab out any excess oil left in the barrel before loading
- Avoid lubricants that gel with cold (we suggest dry PTFE lubes for firing pin assemblies)

If you are using full powered standard shotgun primers and doing the above maintenance and still having issues only when using Blackhorn209 (typically diagnosed by successfully and repeatedly igniting a load of other easier to ignite black powder substitute), the cause is most likely a poor seal on the primer or projectile.

**Poor primer seal can also be diagnosed by having soot or blow back on the sides of the 209 primers; only the primer's face should have soot on it:**

### **Remedies for proper ignition of Blackhorn209 powder:**

- Change Primer: Use only standard shotshell, full powered 209 primers with Blackhorn209. Muzzleloader primers do not have enough heat to set Blackhorn209 off constantly.
- Seal Primer: full power 209 shotshell primer sealed with light crush into the breech plug; one should feel some resistance when closing the bolt only when there is a primer in the nose. Failure for the primer to seal is commonly caused by not using the brand of primer the rifle was headspaced for, burs in the breech plug, reusing primers that were already crushed, or losing shims. Correct by removing burs, changing to a longer brand of primers, or purchase a set of shims from Badger Ridge and reset headspace using them.
- Change projectile: Powerbelts, Bore Locks, Minnet, Lubed conicals, Minnie-balls, etc, do not seal until the powder charge combusts & produces gases that expand & presses them into the rifling. Some clients report success using magnum primers with Blackhorn 209 and these sorts of projectiles. Western Powders recommends using snug fitting sabot bullets with Blackhorn209.
- Change powder: Black Powder and most substitutes will combust easily and work OK when not completely sealed; however Blackhorn209 needs a good seal for proper ignition. Just switching powders may work, but is not really fixing the problem. Sealing up the primer and projectile is required for Blackhorn209 to ignite.

*The Rifle's Owners manual is available for download at [www.BadgerRidgeInd.com](http://www.BadgerRidgeInd.com)*