

TriggerShims Tech Tip - The Role of Cylinder Shims

Understanding Cylinder-to-Barrel Gap and End-Shake in Revolvers

At TriggerShims.com, we advocate for maintaining your firearm's peak performance using simple, non-invasive solutions. With over 50 different cylinder and yoke shims designed to fit hundreds of revolver models—all proudly made in America from American stainless steel—we provide the tools you need to enhance your firearm's reliability, accuracy, and longevity.

Quick Synopsis: Fix End-Shake Without Altering Your B/C Gap

Revolvers can develop excessive end-shake—the fore-and-aft play in the cylinder—due to wear from repeated firing, especially with high-power or +P loads. This wear often stems from peening on the cylinder yoke shaft. Installing cylinder shims from TriggerShims.com effectively limits this movement, stabilizing your revolver **without changing or increasing the barrel-to-cylinder (B/C) gap**. It is an affordable, effective fix that maintains your revolver's original factory specifications.

The Basics: What is Cylinder-to-Barrel Gap?

The cylinder-to-barrel gap, commonly referred to as the B/C gap, is the small space between the front face of the revolver's cylinder and the rear of the barrel (known as the forcing cone). This gap is essential for allowing the cylinder to rotate freely during operation. Typically measuring between 0.004 and 0.008 inches, it is a fixed design feature set during manufacturing.

A proper factory B/C gap balances several critical performance factors:

- **Gas Efficiency:** A tighter gap minimizes escaping gases when firing, preserving bullet velocity and energy.
- **Accuracy:** Consistent gaps ensure the bullet transitions smoothly into the barrel, reducing turbulence.
- **Safety:** Too wide a gap can lead to “spitting” of hot gases, powder, or lead particles, while too tight a gap risks binding or cylinder drag.

Over time, however, issues like mechanical wear can indirectly affect how this gap performs, which brings us to end-shake.

End-Shake: The Hidden Culprit in Revolver Wear

End-shake refers to the axial play or fore-and-aft movement of the cylinder along its yoke (also called the crane) shaft. In a well-maintained revolver, this movement is minimal—often just a few thousandths of an inch—to allow for smooth rotation and heat expansion. But excessive end-shake develops from repeated use and can severely compromise your revolver's function.

How End-Shake Develops

One major contributing factor is wear on the cylinder yoke shaft. The shaft, which supports the cylinder, endures constant pounding from recoil forces during firing. This damage is heavily exacerbated by:

- **High-Power Loads:** Magnum or +P ammunition generates intense pressure and violent recoil, accelerating component wear.
- **The Peening Effect:** The constant pounding acts like a hammer repeatedly striking metal, flattening surfaces, deforming or "peening" the shaft end, and increasing play over thousands of rounds.

Other contributing causes include general fouling, poor lubrication, or factory manufacturing tolerances that naturally loosen with age.

The Destructive Side Effects of Excess Play

As end-shake worsens, the cylinder shifts forward and backward more freely, leading to:

- **Momentary Increase in Effective B/C Gap:** While the fixed gap itself does not change, excessive play allows the cylinder to shift violently rearward under recoil, widening the functional gap temporarily *during* the exact millisecond of firing. This causes severe gas loss, lead/powder spitting, and shot-to-shot inconsistency.
- **Accelerated Component Wear:** The shifting cylinder can batter the forcing cone or cylinder face, rapidly eroding the metal and potentially enlarging the gap permanently over time.
- **Timing Issues:** Loose cylinders may misalign the chambers with the barrel forcing cone, risking bullet shaving, drastically reduced accuracy, or even safety hazards like out-of-battery firing.

The Relationship Between End-Shake and B/C Gap

End-shake and the B/C gap are deeply interconnected but mechanically distinct. The B/C gap is a static measurement, but end-shake introduces dangerous dynamic movement.

- **Direct Impact:** Excessive end-shake amplifies wear at the gap interfaces. Under firing, the cylinder can slam forward (battering the forcing cone) or shift rearward (increasing the effective gap momentarily), leading to erosion that widens the gap over time.
- **Indirect Effects:** More play means inconsistent bullet alignment, higher gas escape, and reduced velocity—issues that are often misattributed solely to a bad factory gap, when end-shake is the true culprit.
- **Headspace Consideration:** Importantly, uncontrolled forward movement from end-shake can temporarily reduce headspace. Attempting to “fix” this by pushing the cylinder forward permanently (e.g., via improper shimming or gunsmithing techniques) would increase headspace permanently, risking light primer strikes, misfires, or unsafe cartridge positioning. Proper solutions avoid this.

 **Measurement Tip:** Check end-shake with quality feeler gauges by measuring cylinder movement with the action closed. If it is over **0.003 to 0.005 inches** (depending on the model and caliber), it is time to address it. Ignoring end-shake can turn a precision revolver into an unreliable one, shortening its service life and affecting consistency.

How Cylinder Shims Solve the Problem—Without Touching Your B/C Gap

At TriggerShims.com, our cylinder shims are precision-engineered washers designed specifically to eliminate excessive end-shake. Shims limit fore-and-aft cylinder movement without altering or increasing the B/C gap. They achieve this by holding the cylinder in a stable, rearward position, preventing the shifts that cause momentary gap widening or headspace issues.

Why Shims Work

- **Installation Simplicity:** Shims are placed at the front of the cylinder (between it and the yoke/frame) or at the end of the yoke shaft inside the cylinder, filling the excess space caused by wear. No machining or permanent modifications are needed—just disassemble, shim, and reassemble.
- **Preserving the Gap and Headspace:** Unlike adjustments that involve modifying the barrel or cutting the forcing cone, shims only stabilize axial play. By biasing the cylinder rearward, they prevent forward slamming (reducing wear) and rearward recoil shifts (avoiding temporary gap increases), all while keeping the factory-set B/C gap and headspace intact. This eliminates risks like binding or misfires from over-correction.

- **Proven Benefits:**

- *Enhanced Reliability:* Reduced play prevents further peening and wear, ensuring consistent operation even with hot magnum loads.
- *Improved Accuracy:* A stable cylinder means better chamber-to-barrel alignment, minimizing gas loss and bullet destabilization.
- *Component Longevity:* By cushioning the yoke shaft from constant pounding, shims dramatically extend the life of critical components.
- *Universal Compatibility:* Our shims fit hundreds of models, including Smith & Wesson, Ruger, Colt, Taurus, Dan Wesson, and more—check TriggerShims.com for your specific model.

Installation Best Practices

1. **Measure First:** Use feeler gauges to confirm your exact end-shake and select the right shim thickness. We offer custom kits with various sizes, typically ranging from 0.002 to 0.007 inches.
2. **Clean Thoroughly:** Completely remove all carbon fouling, old grease, and debris from the yoke and cylinder recesses to ensure a perfect, flat fit.
3. **Test Function:** After installation, dry-fire the firearm and check for perfectly smooth cylinder rotation, zero binding, and unchanged baseline B/C gap.
4. **Professional Help if Needed:** If you are ever unsure about disassembly or shim fitting, consult a qualified gunsmith—our shims are user-friendly, but precision matters.

Please note: Shims are an excellent solution for standard wear, but they are not a cure-all for severe damage. If your revolver shows extreme peening, cracks, or deep structural erosion, professional gunsmith repair may be required.

Final Thoughts: Maintain Your Revolver's Edge

Understanding the interplay between your B/C gap and end-shake is crucial for any revolver owner. By addressing end-shake early with our American-made stainless steel cylinder shims, you protect your investment without compromising design integrity.

Visit TriggerShims.com today to explore our extensive range of over 50 cylinder and yoke shim kits, and keep your firearm performing like new.

Have questions? Drop us a line—we are here to help!

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