



Brownells Barrel Set Back Fixture is designed for the Gunsmith who does not have a lathe, to enable him to set back revolver barrels to correct excessive barrel-cylinder gap. "Set Back" is the process of shortening the distance from the barrel muzzle to the barrel shoulder. This allows the barrel shank to protrude farther into the frame opening. The Fixture is also used for fitting new revolver barrels, to adjust the "draw" of the barrel so that the front sight is aligned with the vertical axis of the frame.



WARNING



Never attempt to disassemble or reassemble a firearm unless you are absolutely certain that it is empty and unloaded. Visually inspect the chamber, the magazine and firing mechanism to be absolutely certain that no ammunition remains in the firearm. Disassembly and reassembly should follow the manufacturer's instructions. If such instructions are not immediately available, contact the manufacturer to see if they are available. If they are not available at all, then you should consult other reference sources such as reference books or persons with sufficient knowledge. If such alternative sources are not available and you have a need to disassemble or reassemble the firearm, you should proceed basing your procedures on common sense and experience with similarly constructed firearms.

With regard to the use of these tools, the advice of Brownells Incorporated is general. If there is any question as to a specific application it would be best to seek out specific advice from other sources and not solely rely on the general advice and warnings given.

HOWTO USE

WARNING! BEFORE STARTING ANYWORK: Make absolutely sure that the firearm is **EMPTY** and **UNLOADED**. Disassemble the firearm to the degree necessary for the work being performed. Be sure to use a properly fitted action wrench on the frame to avoid springing or damaging the frame. Use of a barrel vise with blocks fitted to the barrel will prevent damage to the sight, underlug or rib, (if present).

1.0 FRAME PREPARATION

1.1 With the barrel removed from the frame, closely inspect the frame threads for damage. Pay close attention to the very thin area below the barrel on double action revolvers where the crane fits the frame - this area is prone to cracking. Inspect the front face of the frame for burrs or ridges due to previous overtightening of the barrel. If any irregularities are noticed, stone this face square with the threaded section of the frame. Brownells special taps will clean up most frame thread irregularities in Smith & Wesson revolvers.

2.0 TOOL SET-UP

2.1 Insert the proper Pilot to match the barrel's bore into the Pilot Carrier, and lock in place with the setscrew. Make sure that the Pilot selected will enter the barrel without binding. Remove the Cutter from the Set Back Fixture body, and clamp the Body in a smooth jawed or padded bench vise, with the large hole for the barrel shank positioned about flush with one side of the vise jaws. If your vise is a swivel base type, position it so that you will be able to push the barrel into the Fixture. **2.2** Insert the Pilot into the barrel and slip the Pilot Carrier into its hole in the Body. Loosen the Depth Adjustment Screw Locknut on the back of the Body. Determine which Cutter Clamp Screw you will need based on barrel shank diameter. Small-shanked barrels, such as Smith & Wesson K & L frames, most Colts, and Ruger® Security-Six® series will use the Short Clamp Screw, while large-shanked barrels, such as Ruger Redhawk® and Smith & Wesson N frames, will need the Long Screw. **2.3** Set the Cutter into its recess in the Body, with the Clamp Screw turned one or two threads into its hole. Hold the Cutter's carbide cutting tip against the barrel threads, and adjust the Cutter Depth Screws just to touch the bottom of the cutter recess in the Body. Tighten the Cutter Clamp Screw until you "feel" the head just touch the Cutter. Tighten the Cutter Depth Screws an additional 1/16th of a turn, to very slightly raise the Cutter off the barrel threads and also lock the Cutter against the Clamp Screw. Important Note: You DO NOT want the Cutter to touch the barrel threads! Due to the possibility of tolerance differences in the carbide Cutters, make sure that the front edge of the Cutter is positioned at right angles to the barrel's boreline, even if this leaves the side of the Cutter at a slight angle to the boreline. **2.4** Touch barrel's shoulder lightly against the front edge of the Cutter and tighten the Depth Adjustment Screw on the back of the Body until it just touches the back of the Pilot Carrier. The Depth Adjustment Screw

BROWNELLS® BARREL SET-BACK FIXTURE

READ & FOLLOW THESE
INSTRUCTIONS

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is threaded 1/4"-28, each full turn will move it .036". For example: A Smith & Wesson barrel, with 36 threads per inch on the barrel shank, has to be set back one turn (about .028"). Turning the Depth Adjustment Screw *out* three-quarters of a turn will move the Depth Adjustment Screw approximately .027" (3/4 of .036"), setting the barrel back the appropriate amount. Hold the Depth Adjustment Screw in the desired position and use a small crescent or open end wrench to tighten the Lock Nut against the Body.

NOTE: Set up the Depth Adjustment Screw so that the Cutter will make a *shallower* cut than you have computed to be necessary. Make a second, or even a third, "clean-up" cut to bring the barrel to the desired point.

3.0 SETTING BACK BARRELS

3.1 Determining Amount Of Set Back. You can calculate how much the barrel shoulder will have to be set back by checking the chart included with these instructions. If your revolver is not listed, first measure the number of threads per inch on the barrel shank. Divide *one inch* by the *number of threads per inch* to find the amount that the barrel moves per each full turn. This is the approximate amount of metal that must be removed to set the barrel back 1 full turn.

Example: A Smith & Wesson Model 19 (K-Frame) needs the barrel set back one turn to correct the excessive barrel-cylinder gap present after correcting excessive headspace and cylinder endshake. To set the barrel back one turn; divide *one inch* by the *number of threads per inch* (36). The answer of .0277" (round off to .028") is the amount the barrel shoulder will have to be cut forward (towards the muzzle).

3.2 Barrel steels vary quite a bit in their hardness and toughness. Some barrels will cut quite differently than others. Use plenty "good quality" cutting oil, such as Brownells Do-Drill, on the barrel's shoulder. Apply light, even pressure to the barrel, and turn it into the cutting edge of the Cutter, in a *clockwise* direction. **Never** turn the barrel backwards against the Cutter, as you will probably damage the carbide cutting edge. Stop cutting frequently to clear chips from the Cutter and barrel shank, and apply fresh Do-Drill to the barrel shoulder area.

After about half of the calculated amount of metal has been cut from the shoulder, clean off chips and oil from the barrel and try it in the revolver frame. Turn the barrel in, by hand, until the shoulder gently touches the frame face. Note the position of the barrel in the frame, and unscrew it from the frame. Continue cutting the shoulder, stopping frequently to check the barrel in the frame, until you have cut the calculated amount from the shoulder. When hand tightened, the barrel should need 1/10 to 1/8th of a turn to bring the front sight vertical, or "square" with the frame. It may be necessary to cut off slightly *more* than the calculated amount from the shoulder to get this 1/10th to 1/8th of a turn "draw."

Important: Too much "draw" may cause damage to the frame and barrel. Too little "draw" may cause the barrel to shoot loose, jamming the gun as the underside of the barrel, and any underlugs, bind against the extractor rod. The gun may also have excessive spitting from the barrel-cylinder gap and, the front sight will be "out of square" with the frame, causing a point-of-impact change at the target.

If the hardness/toughness of the barrel has caused the Cutter to chatter, several turns of the barrel against the Cuttec, with the pilot Carrier touching the Depth Adjustment Screw, will usually clean up the shoulder. A small triangular stone may be used for final dressing of the shoulder area.

3.3 Refitting The Barrel. If the barrel has an under-rib, or a shrouded ejector rod, (as used on S&W Model 19 revolvers, S&W L and N frame models, Colt Pythons, Diamondbacks, and other), the rib or shroud will have to be relieved where it butts up to the frame so that the crane does not hit it on closing.

Clean both the threaded shank of the barrel and the frame, using a good solvent. Make certain that there are no chips left on either piece. Apply a small amount of gun oil, light grease, or a commercial anti-sieze compound to the threads on the barrel, and hand tighten it into the frame. Place the barrel into the barrel vise, and use a properly fitted action wrench to tighten the barrel so that the front sight is aligned with the vertical axis of the frame. Important: DO NOT TIGHTEN THE BARREL PAST THE 12 O'CLOCK POSITION, or it will have to be refitted.

3.4 Refer to Section 5.0 for the "Finishing Touches" to complete the job.

4.0 FITTING NEW BARRELS

4.1 Fitting new factory and after market target barrels is similar to setting back existing barrels. Prepare the frame carefully, making absolutely certain that there is no dirt or crud in the frame threads or on the face of the frame. Clean and lightly lubricate the new barrel's threads, and attempt to hand fit the barrel to the frame. If the barrel fits the frame threads tightly to the point that the barrel binds, the frame and/or barrel threads may need to be cleaned up with an appropriate sized tap or die.

The new barrel will usually stop in the frame with the front sight (or top of a bull barrel blank) between the 6 o'clock and 3 o'clock positions. . . in other words, about one-half to one-quarter turn from the proper, finished position. Determine, as closely as possible, the stopping point of the barrel as a fraction . . . that is, lacking 1/2 turn, 3/4 of a turn, or whatever. As with a barrel set back job, you want the new barrel to hand tighten to within 1/8th to 1/10th of a turn. You will have to compute the difference between the hand tightened position of the new barrel and the desired stopping point, to get the 1/8th to 1/10th of a turn "draw" on the barrel.

Example: A Ruger Security-Six is being fitted with a new Bull Barrel. The barrel hand tightens to the 5 o'clock position, lacking about 42% (4/10ths is close enough) of turning up to the 12 o'clock point. You want the barrel to hand tighten to about 1/10th of a turn. Since the Ruger is threaded 24 threads per inch, each turn advances the barrel about .042". You will need to remove about 30% (3/10ths of .042", or about .0126", from the barrel shoulder to get the barrel to stop at the 1/10th turn position when hand tightened. The barrel lacks 4/10ths of a turn of tightening to the vertical position. You want it to stop at the 1/10th position. 4/10 minus 1/10 equals 3/10, or 30% of the distance each full turn moves the barrel.

4.2 Adjust the cutter as described in Section 2.0. Loosen the Depth Adjustment Screw locknut to just touch the Pilot Carrier and set the Depth Adjustment Screw. Use a depth micrometer or dial caliper to measure the distance the Depth Adjustment Screw protrudes from the Fixture Body, and write this down. Since our example job needs to move the barrel shoulder forward about .0126", back out the Adjustment Screw a bit less than the desired amount (about .009" would be right) using the dial caliper to confirm the distance moved. Lock the Depth Adjustment Screw with the Locknut. Use plenty of cutting oil on the barrel shoulder and Cutter, and make the cut. Remove the barrel from the Fixture and clean the barrel shank and shoulder of all chips and cutting oil. Screw the barrel into the frame hand tight, and note where it turns up to. You should still lack a bit of coming up to the 1/8 to 1/10th turn position. Readjust the Depth Adjustment Screw and take another, very light cut on the barrel shoulder. Clean off and try the barrel in the frame again.

4.3 From this point, proceed as you would for a barrel set back job, paying very close attention to the barrel-cylinder gap adjustment. Refer to Section 5.0 for the "Finishing Touches" to complete the job. If you are fitting a bull barrel, fit the front sight or sight rib and the underlug, if used, after the barrel has been fitted to the frame and function tested/test-fired.

5.0 FINISHING TOUCHES

5.1 Setting Barrel-Cylinder Gap & Recutting the Forcing Cone. We recommend using Brownells Revolver Chamfering Tool, 90° Facing Cutter to set the barrel-cylinder gap. The minimum barrel-cylinder gap is usually .004" and the maximum recommended gap is only .008". Extreme care must be taken not to cut the barrel at an improper angle to the bore, or cut the barrel face too far forward.

After the barrel-cylinder gap has been properly set, cut or re-cut the forcing cone. If you are setting back a Ruger .38/.357 barrel with a 5° angle, you will have to use this same angle on the forcing cone. If you have set back the barrel on a Colt or S&W, or most other revolvers, you can use either the 18° or 11° cutter. See the di-

rections sent with the Revolver Chamfering Tool Kit for details on setting the barrel cylinder gap and cutting the forcing cone.

5.2 Refitting Ejector Rods. On Smith & Wesson, Ruger and other revolvers with a front lockup that engages the Ejector Rod end, the Ejector Rod and Center Pin will have to be shortened and refitted after barrel set back. Make a sketch of the Ejector Rod end so that you can duplicate the contours after the length has been adjusted. Determine the amount to be removed to allow proper closing of the cylinder - this should be approximately the same amount that the barrel was set back. The length can be determined by measuring from the end with a dial caliper or depth mike, and placing a wrap of masking tape around the Ejector Rod at that point. Hand file the knurled end or chuck the rod into a drill press chuck, use a fine cut file, and cut back the end of the rod until the file just touches the masking tape. (Make sure that any file used around moving machinery, such as a drill press or lathe, has a handle attached to the tang!) File a bevel on the rod to duplicate the factory bevel - refer back to the sketch you made earlier. Shorten the Center Pin until the front lockup seats properly and will fit flush, or slightly beyond flush, with the end of the Ejector Rod when the Cylinder Latch thumbpiece is operated to open the cylinder.

If a barrel has been set back on a single action revolver, the Ejector Tube or Housing will have to be refitted along with the Ejector Rod. Most single action revolvers use a smaller diameter rebated section on the end of the Housing that fits a recess in the Frame. This rebated section will have to be filed forward, towards the muzzle end of the housing, by about the same amount the barrel has been set back. The Ejector Rod will also have to be shortened, but by as little as possible. Leave the Ejector Rod as long as possible to get the maximum stroke for ejecting empty cases. The end of the Ejector Rod should not protrude into the Frame opening or "window".

5.3 Detailing Out The Job. Any bare metal showing from the barrel set back job, such as the frame face and the end of the ejector rod, should be carefully cleaned of greases and oil, and touched-up with a good touch-up blue like Brownells Dicropan T-4.

Reassemble the firearm according to the manufacturer's instructions. Check for proper functioning using **ACTION PROVING DUMMIES**. Make sure **ALL SAFETY MECHANISMS** are fully functional as designed and approved by the manufacturer. If these tests prove satisfactory, test-fire the firearm with live ammunition in a **SAFE** and **APPROPRIATE** manner. **IMPORTANT!** Start the live ammunition tests by first loading an **ACTION PROVING DUMMY**, then a live round, into the magazine. Only after several tests have been conducted in this manner should additional rounds be placed in the magazine and fired.

DEPTH ADJUSTMENT & BARREL THREAD MOVEMENT

Movement figures are approximate; manufacturing tolerances may affect actual movement. Double check amount of movement with depth micrometer or dial caliper.

DEPTH ADJUSTMENT SCREW CHART

Each Full Turn Moves Screw .036"

TURN	MOVEMENT	TURN	MOVEMENT
1/8"	.0045"	5/8"	.0225"
1/4"	.009"	3/4"	.027"
3/8"	.0135"	7/8"	.0315"
1/2"	.018"	1"	.036"

BARREL THREAD CHART

MAKE & MODEL	# THREADS PER INCH	MOVEMENT PER FULL TURN, INCHES
S&W J Frames	36	.028
S&W K Frames	36	.028
S&W L Frames	36	.028
S&W N Frames	36	.028
Ruger "Six" Series	24	.042
Ruger GP-100®	24	.042
Ruger Redhawk®	20	.050
Ruger Blackhawk®	24	.042
Colt Python	32	.031
Colt Trooper (J, V & AA)	36	.028
Colt SAA (Old Model)	20	.050
Colt SAA (New Model)	24	.042
Colt 1917	20	.050