

Inspection Guide For Smith & Wesson Revolvers

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Chapter 1: Introduction

This text is designed as an inspection and preventative maintenance guide for S&W revolvers. It is not intended to be a repair manual. If you note a problem while inspecting, consult with your gunsmith or S&W factory service. Modern revolvers are available in a variety of frame sizes and calibers. For the most part, they all work the same. Should you need parts, you will need to know your frame size, model number, and dash number. Many parts must be installed by a competent gunsmith or S&W factory service because they require fitting.

Frames

J Frame: The smallest of the current production frames. Except for the coil mainspring, hammer, and hammer strut, all parts are similar in looks and function with larger frames. J frames were made in calibers from 22 LR to 357 Magnum. The grip frame, cylinder frame, and internal parts are notably smaller than those in larger frames.

K Frame: The most popular mid-size frame of all S&W revolvers. K frames have been made in 22 LR to 357 Magnum.

L Frames: The larger L frame shares the same grip size as the K frame, however the cylinder and mainframe are more massive. These frames became popular when the Mod 586/686 were introduced. The L frame supports 357 Magnum and larger calibers.

N Frames: The N frame is larger and more massive than the L frame. Its grip frame is unique, being a bit larger than any other frame. N frames are made in 357 Magnum, 44 Special, 44 Magnum, 45 ACP and 45 Colt.

X Frames: The largest frame made by S&W has the same grip frame as a K or L frame. The X frame is the newest addition, designed specifically for the 500 S&W cartridge.

Model Numbers, Dash Numbers, and Serial Numbers:

In 1958, S&W went from names to numbers. They had so many different models in production, it became difficult to keep things straight. The pre-1958 guns had nothing more than a cartridge type and serial number marked on the gun. Later made guns have the model number and dash number stamped on the frame, visible when the cylinder is opened. All S&W revolvers have the serial number stamped in the bottom of the grip frame. Newer models also have the serial number under the yoke, by the model number. Each time a significant engineering change was made, a dash number was assigned. Example: Mod 686-4. This would indicate the 4th engineering change to the basic 686. Of course nothing can be simple. In Mod 10's the even dash numbers are for heavy barrels and the odd dash numbers are for tapered barrels.

P&R, 3 Screw, 4 Screw, 5 Screw, and Transition Guns

Early production revolvers had four screws in the side plate and one screw in front of the trigger guard. These were known as 5-screw models. Later, the top sideplate screw was eliminated and replaced with a tab. These guns were known as 4-screw models. About the time model numbers were assigned, the screw on the front of the trigger guard was eliminated. Since that time, all are 3-screw models. P&R is the common acronym for "Pinned and Recessed". These older model guns had a pinned barrel and recessed cylinders in magnum chamberings. As S&W made engineering changes, there were times when guns were produced with a new change before a new dash number was assigned. Then there were times when the new dash numbers were changed but S&W opted to use up existing parts. These models are known as transition guns.

MIM & Forged Parts, Firing Pins, and Shrouded Barrels

Cost cutting changes involved the introduction of Metal Injection Molded (MIM) parts where forged and machined parts were previously used. S&W has stopped production on all older forged parts so you may experience problems with parts replacement. Another cost cutter was to install in-frame firing pins instead of the older hammer nose pins. These are no better or worse, just different. S&W rim fire revolvers have always used in-frame firing pins, as have other gun manufacturers. Shrouded barrels are starting to replace solid barrels. Again, a cost cutter that has little effect on function.

Chapter 2: Field Inspection

The purpose of a field inspection is to determine the overall mechanical condition of a revolver without firing it. This is handy when buying a gun or to just test the guns you already own. It's a good idea to do a field inspection each time you clean your revolver.

Tools & Supplies: You will need a proper screwdriver for the sights and side plate screws plus an automotive pocketknife type feeler gauge. A small flashlight, spent cases with the primers removed, and some lead and jacketed bullets will be needed too. A range rod is optional.

Timing: Basically, timing is the sequence of events that happen when you begin to pull the trigger in Double Action (DA) mode or to cock and fire in Single Action (SA) mode. A full timing sequence for DA and SA is included in the addendum. Timing problems can be costly so pay good attention to your testing. This test deals with carry-up, meaning when the cylinder locks into the cylinder stop as the hammer is cocked.

Slowly cock the hammer in SA mode. Watch the cylinder stop located in the lower frame under the bottom of the cylinder. The cylinder stop should lock into the cylinder's notch at or before the hammer reaches the cocking sear. Test all chambers.

In DA mode, slowly squeeze the trigger and watch the cylinder stop. It should lock into the cylinder before or just as the hammer drops. Test all chambers.

Lock-up: This test will indicate the condition of the cylinder stop, hand and ratchets. A vault solid lock-up is not necessary however excess cylinder play is not good. The test condition puts the gun in the same position as when it is fired. Test all chambers.

Dry fire in DA mode then hold the trigger all the way back. Hold the cylinder and gently try to rotate it clockwise and counter clockwise. A few thousands of free movement is normal. Excessive movement indicates a problem.

Trigger reset: This test will indicate a weak or altered trigger rebound spring. It could also indicate a bad trigger or cylinder stop.

Dry fire the gun several times as rapidly as you can in DA mode. The trigger should snap back and reset each time. If the trigger “short strokes” or is sluggish, it indicates a problem.

Trigger pull: A heavy trigger pull is not an indication of problems. Often the mainspring and trigger rebound spring have been replaced or altered to reduce trigger pull. A very light trigger pull could result in light primer hits.

Cock the hammer in SA mode. Squeeze the trigger lightly. You should feel no creep or grit before the hammer drops. Pull the trigger through several DA strokes to feel the action. You should not feel grit or inconsistent pull.

Hammer push-off: The sear surface between the hammer and trigger should not push-off with substantial thumb pressure. Excessive pressure could break the sear so don't overdo it.

Cock the hammer in SA mode. Use your thumb to push the hammer forward. The sear should prevent the hammer from dropping. If the hammer drops when thumb pressure is applied, it indicates a problem.

Barrel-to-cylinder gap: The ideal B/C gap is .006”. A close gap will cause the cylinder to drag when fouled from shooting residue. A wide gap will loose muzzle velocity and may spit particles. The normal usable range is from .004~.010”

Hold the cylinder to the rear and insert the thickest gap gauge that will fit between the cylinder face and the rear of the barrel (with friction). This will be the B/C gap.

Cylinder endshake: This test will measure the front to back free travel of the cylinder. It is a good indicator of wear from shooting. Anything over .002” is considered excessive.

Hold the cylinder forward and insert the thickest gap gauge that will fit between the cylinder face and the rear of the barrel with minimal friction. Subtract the measurement from the B/C gap. This will be the cylinder endshake.

Cylinder-to-bore alignment: This test will indicate proper alignment between the barrel's bore and the cylinder's chambers. Repeat the test for all chambers.

Cock the hammer and shine a light in the firing pin hole (for hammer nose firing pins) or between the back of the cylinder and the recoil shield. Look down the barrel while slightly rotating the cylinder from side to side. Somewhere in the arc of cylinder slack, the bore should line up perfectly with the chamber's throats. You should be able to see the edge of the cylinder appear as the cylinder is rotated slightly. A Range Rod is a more positive way to test for alignment.

Cylinder Assembly: These tests indicate the general condition of the revolver's cylinder. Any exception should be noted.

Unlatch and swing the cylinder out. The yoke should swing freely throughout the arc. No binds or dragging.

Use your thumb to push on the extractor rod. The throw should be smooth and should spring back without binding. The extractor rod can work loose so you need to test it for tightness by holding the cylinder in one hand while trying to rotate the knurled end with the other hand. Note: most revolvers have left hand threads on the extractor rod however, older models have right hand threads.

Hold the muzzle down and spin the cylinder. It should rotate freely and not drag or feel gritty.

With the cylinder all the way open, make sure the rear of the cylinder cannot jump over the frame stud when applying rearward pressure from the front of the cylinder.

Guide the cylinder shut. The yoke should mate perfectly with the frame. There should not be a noticeable crack appear between the yoke and frame when pressure is applied to the right side of the cylinder. The cylinder face should not touch the rear of the barrel when closing.

Headspace: The distance between the cartridge head and the recoil shield is called headspace. There should be adequate space for the cylinder to rotate freely when loaded but not so much where the case can back out when fired. Center fire revolvers should have .006"~.012" headspace, .010" is optimum. Rimfire revolvers should have .004"~.008" with .006" as optimum.

Place a new sized case with the primer removed in each chamber. Using a gap gauge, find the thickest gauge that will slide between the case head and the firing pin hole. This will measure headspace.

Cylinder Throat diameter: The diameter of the cylinder throats have a great influence on accuracy. A large diameter throat will allow expanding gasses to blow by the bullet resulting in a loss of velocity, poor accuracy, and gap spitting. Small diameter throats cause the bullet to be swaged smaller, thus poor accuracy. Note: lead bullets are usually sized .001" larger than jacketed bullets in the same caliber. The recommended throat diameter is .0005" larger than bore diameter. Example: A .357" bore should have .3575" throats.

Insert a proper caliber jacketed bullet in each chamber throat from the face of the cylinder. The bullets should pass through the throat with minimal friction. Repeat the test with lead bullets. They should require considerable force to pass through the throat. Do not use the same lead bullet more than once for this test. If jacketed bullets won't pass through the throat easily, you have a throat that is too tight. If the lead bullets pass through the throat easily, you have enlarged throat(s). Smaller throats can be reamed larger but larger throats cannot be made smaller.

Firing pin protrusion: This test will indicate how far the firing pin protrudes from the firing pin bushing. A short protrusion could result in light primer hits.

For guns with a hammer nose firing pin, swing the cylinder out and hold the cylinder latch to the rear. Dry fire in DA mode then hold the trigger to the rear. Hold the gun muzzle up so you can view the firing pin sticking out of the bushing. Let go of the cylinder latch then use a .030" gap gauge placed against the recoil shield. The pin should be at least as high as the gap gauge.

For guns with in-frame firing pins. Swing the cylinder out and hold the cylinder latch to the rear. Cock the hammer in SA mode then release the cylinder latch. Use a tool to push the firing pin forward (it's located where the nose of the hammer would strike). Hold the gun muzzle up so you can view the firing pin sticking out of the bushing. Place a .030" gap gauge on the recoil shield while holding the firing pin forward. The pin should be at least as high as the gap gauge.

Adjustable Rear Sight: This test will indicate if the sight is working properly.

Use a proper screwdriver and rotate the windage screw back and forth then the elevation screw up and down. Count clicks so you can return to the proper setting. The sight leaf should track and not bind. Grab the sight leaf and see if it has free play. None should be noted.

Screw tightness: Use a proper screwdriver and test each side plate screw for tightness. Also check the screw that holds the rear sight, the cylinder latch screw, and the grip screw.

Visual Inspection: Hold the gun as if you were going to shoot. Look carefully at the front sight. Make sure it is not cocked slightly to the side. This would indicate the barrel is not screwed in properly. Swing the cylinder out and examine the forcing cone. It should be free of fouling and appear nice and smooth. Inspect the bore looking for a smooth and shiny condition with pronounced rifling. No bulges, restrictions, or pitting should be seen. Examine all the chambers in the cylinder. They should all be smooth and shiny. The cylinder face should be free of lead and powder residue. Examine the top strap just above the forcing cone. There should be minimal flame cutting and no sign of lead residue. Look the gun over and note any rust, pitting, scratches, dings, or other marks. Examine the grips for cracks, dings, and finish.

Chapter 3: Preventative Maintenance

S&W revolvers work much better when they are clean and properly lubricated. Additionally, they have a much longer life expectancy when properly maintained. Revolvers spend much of their time in storage so rust prevention is also important. Your climate and shooting habits have a lot to do with cleaning frequencies. The information provided can be altered to meet your needs.

After each shooting session, the revolver should be field stripped, cleaned, lubricated, reassembled, and wiped down.

Field Stripping: Use a proper screwdriver and remove the front sideplate screw. Push the cylinder latch forward to release the cylinder, then swing the cylinder out. Pull forward on the yoke while holding the cylinder in place. After the yoke has been removed, set the cylinder assembly and yoke aside. Remove the grip screw and take the grips off. Field stripping allows better access to the parts you need to clean and lubricate.

Use your favorite bore cleaner and a bronze bore brush to scrub the cylinder chambers and bore. Use 0000 steel wool and bore cleaner to clean the cylinder face and the frame area. Make sure all lead, jacket, and powder fouling have been removed. Use clean patches to mop the bore and cylinder chambers. Wipe down the inside of the frame and the cylinder with a clean rag. Clean the residue from the yoke. Place a clean patch in the cleaning rod and apply a few drops of oil. Mop the bore and cylinder chambers with the oil patch.

Place one drop of oil in the frame's cylinder stop window. Place another drop in the frame's hand window. While holding the cylinder, push the extractor rod in and thoroughly clean the area under the extractor on both the cylinder surface and extractor surface. Place one drop of oil on the extractor shaft then release the extractor rod. Put one drop of oil on the yoke shaft and another drop on the extractor rod.

Reassemble the yoke and cylinder by placing the yoke on the extractor rod then guiding the yoke into both the frame and cylinder. Install the front sideplate screw.

Cock the hammer and place a few drops of oil in the frame just in front of the hammer. Hold the muzzle down and place a drop of oil in the rebound slide spring hole and another drop on the hammer's stirrup where it mates with the mainspring. Replace the grips and dry fire a few times to disperse the oil.

Put a drop of oil on the rear sight's windage screw and a drop on the elevation screw. Count clicks and rotate the screws to work the oil in and return to the previous settings.

Apply a liberal amount of oil to the gun's surface and distribute with a clean patch. The gun is ready for storage.

Whenever a blued revolver is taken out of storage and handled, it should be wiped down with an oily rag before being placed back in storage.

Addendum 1

S&W Revolver Diagram



Addendum 2

S&W Revolver Timing Sequence Single Action Cycle

As the hammer is being cocked:

1. Trigger begins to move to the rear.
2. Cylinder stop is pulled down, releasing the cylinder.
3. The hand engages the extractor ratchet and begins to rotate the cylinder CCW.
4. Cylinder stop is released and snaps up to ride on the cylinder.
5. Cylinder stop engages the cylinder notch.
6. Hand cams off of the extractor ratchet.
7. Hammer reaches the cocking point and is held to the rear by the SA sear.

As the trigger is pulled:

7. Trigger moves to the rear raising the hand up to lock the cylinder in place.
8. SA sear releases the hammer.
9. Hammer moves forward.
10. Firing pin enters the frame hole and is diverted slightly upward.
- 10A. Or hammer strikes the frame mounted firing pin.
11. Firing pin strikes the primer causing the gun to fire.

As the trigger is released:

12. Trigger begins to move forward.
13. Hammer begins to move to the rear, pulling the firing pin out of the frame hole.
- 13A. Or the frame mounted firing pin fully retracts.
14. Hammer fully retracted and rests on the rebound slide.
15. Cylinder stop resets.
16. Hand resets.
17. Trigger is fully forward and at rest.

Double Action Cycle

1. Trigger is pulled and begins to move to the rear.
2. Hammer begins to move to the rear.
3. Cylinder stop is pulled down, releasing the cylinder.
4. Hand moves up and begins to rotate the cylinder CCW.
5. Cylinder stop is released and rides on the cylinder.
6. Trigger and hammer continue to move to the rear.
7. Cylinder stop engages the cylinder notch.
8. Double action sear releases the hammer.
9. Trigger moves to the rear causing the hand to cam off the extractor ratchet and lock the cylinder.
10. Hammer moves forward until the firing pin strikes the primer, causing the gun to fire.

The trigger is released and follows the same reset cycle as in Single Action.

These articles are presented as a public service by [Cactus Tactical](#). If you are unsure of any procedures outlined in these articles, you are advised to contact your local gunsmith for service. All firearms must be verified to be unloaded before servicing. This advice is given freely and to be used at your own risk.

This article is one in a series written by Gary Bunker, [Cactus Tactical's](#) Master Gunsmith and rifle tuner.

About [Cactus Tactical](#):

Cactus Tactical Supply was formed in 1999 to support Phoenix, AZ customers with their tactical gear, CQB equipment, assault supplies and ammunition needs. They soon began serving local law enforcements agencies and military organizations as a natural extension of the original business charter. It was a small step after that to go nationwide via the Internet and provide a 24 hour web store to provide law enforcement officers, military personnel, tactical enthusiasts and the armed savvy civilian with a place to buy their tactical gear and equipment at reduced prices. **Cactus Tactical** carries many of the top brands of equipment designed to function effectively in hostile environments. The 24 hour Internet accessible web store currently displays over 3,000 individual items for immediate purchase.

The company is headquartered in Phoenix, Arizona, USA. For more information, log on to www.cactustactical.com or call 877-9-CACTUS.