

IMPORTANT: Save This Sheet

Your will need the information contained on this sheet to order replacement springs as you sell them from the kit. Please see Brownells current catalog for price and packaging information.

Springs shown as close to actual size and shape as possible, but because these springs are hand-made in several small shops they may vary slightly from the illustrations. See **FITTING INSTRUCTIONS** on Back.

No. 9 SHOTGUN MAINSPRING KIT #754-900-000



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READ & FOLLOW THESE
INSTRUCTIONS

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No. 8 TOP LEVER SPRING KIT #754-800-000



Instructions For Fitting Pre-Formed, Tempered Top Lever & Mainsprings

These springs are generally oversize in length, width and thickness compared to the spring they will replace, and will require fitting to the gun. Since they come hardened and tempered, special care must be taken when fitting to avoid drawing the temper and ending up with a soft spring that will not function properly.



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.

FITTING

Inspect the broken spring to establish the relationship of the broken sections. At this time, it would help to make a sketch of the spring, showing the proper relationship of the parts and their dimensions. You will refer back to this sketch when you are fitting the new spring.

Do not overheat the new spring when grinding, filing or polishing it to match the remains of the old broken spring. Any heat color change on the surface of the new spring darker than a "straw" color indicates that excess heat has been applied to the spring. That area of the spring will be softer than the rest. This can cause the spring to take a set at that point. Avoid making any grinding, filing, or polishing marks on the spring at more than a 45° angle to the length of it. This will help to avoid stress concentrations that lead to breakage. When fitted, the spring's surface should show no grinding or filing marks, and any polishing marks should run the length of the spring. Avoid perfectly sharp corners where hooks or protrusions join the spring's limbs...a slight radius is acceptable at these points and will help to avoid breakage.

Occasionally a blank spring will have the right limb length but the wrong curvature. It can be reshaped by heating to a cherry red color, reshaping it as needed. Again, keep all bends gentle, not sharp cornered, to avoid future breakage at those points. After all reshaping has been done, heat the spring to a cherry red heat (under normal room lighting -- not bright sunlight!) and quench in Brownells Tough Quench™. When quenching a spring, plunge it straight in with the ends going in the oil first. Placing the sizes

of the spring into quenching oil first will cause warpage. After the spring has been quenched it will be extremely brittle. **DO NOT ATTEMPT TO FLEX THE SPRING BEFORE TEMPERING, IT WILL BREAK!** Polish the spring, keeping all lines running lengthwise. There are several methods of tempering a spring...with care, all will work well. The most common method involves dipping the spring in the oil, or setting it in a depression pounded in the side of a coffee can with the spring well oiled, and heating it gently until the oil burns off. This sometimes does work, but the method has a major drawback, you cannot regulate the temperature. It is also messy, soot blows around your shop, and it creates a fire hazard!

The next most used method involves laying the spring on a piece of flat steel, with a good shop light shining on it and heating the steel piece from underneath, watching the colors change to "spring temper" color, or about "blue gray". Again, how do you calibrate a set of eyeballs to read a color the same as the next guy?

The most practical method for the small shop is to use a lead bath or nitre bath...molten lead alloy at a temperature of 600° F. or a molten heat treat salts bath. With either product, safety is of the utmost importance! Always wear a full-face safety shield, heavy cotton work shirt, with the cuffs and neck buttoned, heavy cotton work apron, gloves with the cuffs over your shirt cuffs, jeans and sturdy work shoes. If either the lead or nitre salts splash on you while molten, you will be severely burned! It's also a good idea to wear a sweat band around your forehead, and possibly a wool Navy watch cap. Yes, it sounds like a lot of trouble, but it's worth it to prevent a very painful burn.

Bring your tempering bath up to temperature, and verify this with a Brownells Heat Treat Thermometer. Wrap several turns of black iron wire around the spring. Make **ABSOLUTELY SURE** there is no moisture or oil on the spring. Grab the ends of the iron with pliers or long tweezers and immerse the spring in the heat treat bath. Make sure it is completely covered but does not touch the sides or bottom of your pot. Keep the spring in the bath for at least ten minutes for a light spring (such as a top lever spring) or twenty minutes for a heavy mainspring. Remove the spring from the bath and allow to air cool. Remove the wire and clean off any lead or salts residue with a brass or stainless steel, Heavy-Duty Cleaning Brush.

A note on temper temperature: Most spring steel will need to be tempered at about 620° F...but, different batches of steel will require higher or lower temperatures. It is best to go a bit hotter, (which would make the spring too soft) and have to retemper, rather than not temper at a high enough temperature and have a too-brittle spring that will break the first time it's flexed!

Before installing the spring in the gun, look it over carefully to be sure there are no nicks in the spring or heavy scratches run in across the limbs; these are potential breaking spots and must be carefully polished out. All polishing marks must run the length of the spring. Before final fitting the spring to the gun, place it in a smooth-jawed bench vise and flex it through its complete range of motion several times. If it does not break or collapse you have a good spring.

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!** If the firearm is a fully or semi-automatic design, 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.