

## **CONGRATULATIONS...**

You are now the proud owner of the finest *Brownells Fixed-Blade Gunsmith's Screwdrivers*™ ever designed. They are made to extremely close tolerances with a new, crisp, hollow-ground-type radius from the best quality, finest custom modified S-2 steel, designed for screwdriver blades, double-tempered for uniformity, with every aspect of their manufacture closely controlled and monitored. They are specifically made to be reground and reshaped innumerable times and still retain their beauty and functionality. That is why we can guarantee your satisfaction with them 100%.

However, when you have a Cadillac or Rolls Royce, you don't use it to drive across plowed fields - you take care of it with the regard it deserves for the workmanship that went into making it one of the finest riding cars in the world. Likewise, with these. *Brownells Fixed-Blade Gunsmith's Screwdrivers*, you don't use them to pry open paint cans, or to get in somewhere and pry and poke. They are specifically designed to break before they bend because, when working with the fine gun screws for which they are intended, it is more important to break and leave the screw unmarked, than it is to scar and scrape up the screw when the screwdriver blade bends or tears. A buggered up screw - particularly on an expensive gun where replacement screws are not available - is an unforgivable sin in the eyes of top-quality gunsmiths and their knowledgeable and demanding customers. A broken screwdriver blade or bit is cheap insurance, especially since these blades are specifically made to be ground, reground, and reground time and again. For, to the professional gunsmith, grinding screwdriver blades or bits to fit a screw slot exactly is just one of the basic skills.

With your *Brownells Fixed-Blade Gunsmith's Screwdrivers* Set we have included a dropper-topped bottle of Brownells Penetrating Oil to help you in loosening tight screws, and our special Fixed-Blade Shaping Stone to properly grind a blade when you do need to reshape it.

In the instructions that follow we walk you very carefully through the proper use of these *Brownells*

*Fixed-Blade Gunsmith's Screwdrivers*, including how to properly remove and set a screw, how to keep blade breakage to a minimum by using common sense and how to regrind the blade when you need to. Please bear in mind that while all the handles are the same size - the blades vary in thickness from .030 to .060, and the thinner ones are only a few thousandths larger than those in many jeweler's screwdrivers which have very small handles. The reason they have teeny handles is so you cannot get a ham-fisted grip on them and apply far more force than these very thin pieces of steel can possibly stand. Ours, with a big handle (which is wonderful for control and when putting in a screw) make the blade very vulnerable if you decide to get on a frozen/rusted or Loctited® screw and crank as hard as the big handle will allow. You will most assuredly break the very thin blades and have to regrind them. Use common sense and take care of these screwdrivers and they will provide you with a lifetime of use and pleasure.

## **A GUIDE FOR THE PROPER USE AND CARE OF YOUR *BROWNELLS FIXED-BLADE GUNSMITH'S SCREWDRIVERS***

### **An Unbreakable Screwdriver?**

All of us involved with firearms dream of finding that "special" rifle that will never miss, the checking cutter that will never cut anything but straight, perfect lines, or a screwdriver blade that will never break. Unfortunately, no matter how much we might search for these items, they exist only in our dreams! There is no "unbreakable" screwdriver blade. EVERY commercially available screwdriver blade can be broken under some conditions or set of circumstances. It is simply impossible to make a screwdriver blade that is totally indestructible. The *Brownells Fixed-Blade Gunsmith's Screwdrivers* are made of the best obtainable custom modified S-2 steels and are double-tempered

for the optimum combination of hardness and toughness. Given proper care and use, these screwdrivers will provide excellent service. However, if improperly used, they will fail!

The *Brownells Fixed-Blade Gunsmith's Screwdrivers* are available in a variety of shank diameters and blade thicknesses to cover a wide range of applications. The thinner blades are especially useful for the narrow slotted screws that are so often encountered on European firearms. The user should bear in mind that thin blades are, by the very nature of their construction, weaker than thick blades. Less steel is present to take the stress or force that is involved in loosening or tightening a screw.

Given screwdriver blades of equal width but of different thicknesses, an equal amount of torque, or force, applied to both, may well cause the thinner blade to fracture. A thin blade simply cannot be constructed that will withstand the same amount of stress that an identical width, thicker blade will handle.

### **Break Or Bend?**

When a screwdriver blade fails, the blade will either fracture/break or bend and distort. Under normal conditions, it is best to have the blade fracture cleanly rather than bend. If a blade bends, it will transfer the stress or torque to the sides of the screw slot. Since a blade will always bend in a non-uniform or uneven manner, the transferred torque, or pressure, will also be uneven. This WILL distort or mar the screw slot.

All of us here at Brownells feel very strongly that as professional gunsmiths, we would much rather break the blade on a screwdriver costing a minimal amount than to mar or damage the slot on a screw in a gun costing several hundred or several thousand dollars. As Bob Brownell has often said, "If something is gonna break...let it be the cheaper part!"

## **Proper Screwdriver Fit**

The single greatest cause of screwdriver blade breakage is improper screw slot fit. The screwdriver blade selected for a particular screw must be a “perfect” fit or match to that screw slot. It **MUST** have a blade thickness equal to the width of the screw slot. The blade must also match the length of the screw slot for maximum effectiveness.

When using thin-bladed screwdrivers, the importance of a “perfect” fit becomes even greater. A snug, “perfect” fit ensures the stress applied to the screwdriver blade is distributed evenly over the entire width of the blade. If the fit is less than perfect; if the blade is even a few thousandths too thin, the primary stress will be centered on the very edge of the width of the blade. Inevitably this will lead to a broken screwdriver blade or a burred screw.

There is no compromise for a “perfect” fit, especially on frozen, stuck or Loctited screws. “Close enough” will always lead to breakage of the blade or damage to the screw. Knowledgeable professional gunsmiths have for centuries, realized the importance of proper screwdriver fit and have made the fitting or grinding of screwdriver blades a mark of professionalism and competency.

## **Developing A “Feel” For Using A Screwdriver**

In turning a screw, pressure should be applied in a smooth, even manner. A sharp twist or impact is not desirable in most situations. A firm, judicious pressure will move the screw with minimal chance of damage to the screwdriver blade or the screw slot, and will enable you to maintain complete control of the screwdriver. This is especially important if the blade or screw head breaks or fails.

The screwdriver must be held properly in line with the axis of the screw, not canted or slanted off to one side. Sufficient downward pressure must be applied to keep the blade seated in the screw slot.

Excessive downward pressure may lead to damage of the surrounding metal and loss of control of the screwdriver blade. Remember, if held properly, the screwdriver blade will snap or fracture on a line with or above the edge of the screw slot, with minimal risk or damage to the screw.

As for the screwdriver blade “skidding” across a receiver or stock, this will seldom occur if the screwdriver is positioned properly and appropriate downward pressure applied. If the blade moves away from the slot, you can be 99.9% certain that the screwdriver and blade were positioned improperly and excessive pressure was applied. Be VERY CAREFUL EVERYTIME you use a screwdriver!

### **How To Loosen A Tight Screw**

The removal of a tight, stuck or Loctited screw may cause a great deal of difficulty and, if handled improperly, can result in damage to the screw, the gun or the screwdriver blade. However, if the problem is approached in a cautious and careful manner, the possibility of damage can be minimized. ALWAYS use caution and care in dealing with any situation where force must be applied to a gun or gun part.

We suggest that you initially attempt to “break” the screw loose by tapping the end of the screwdriver handle with a light hammer (never heavier than 8 oz.). The screwdriver, whose blade MUST fit the screw slot PERFECTLY, should be held so the axis of the shank is in line with the axis of the screw; DO NOT allow the screwdriver to tilt. Hold the screwdriver securely in the screw slot and strike the end of the handle lightly a few times. Often, this alone will “break” the screw loose.

If this does not work, apply a drop or two of Brownells Penetrating Oil, or another good quality penetrating oil to the threads. You must make sure the penetrating oil actually contacts the threads. On some screws the threads are at the end of a long shank far from the screw head, and it can be difficult, if not impossible, to get the penetrating oil to the threads. (If you suspect a screw is Locti-*ted*, penetrating oil will not work. You must heat the screw until the Loctite releases.)

When the Penetrating Oil cannot be used, or you encounter screws that are rusted in place and simply cannot be turned with normal procedures, we suggest that you use a properly fitted Brownells **MAGNA-TIP**® Bit with your drill press. The gun or workpiece is secured in a machinist's vise directly below the chuck. The **MAGNA-TIP** Bit is placed in the chuck and lowered so it seats firmly in the screw slot. The quill is then locked. The chuck is now turned BY HAND. Because the quill is locked, the **MAGNA-TIP** Bit simply cannot ride up and out of the screw slot. With this technique, the screw will turn or the **MAGNA-TIP** Bit or the head of the screw will break! Needless to say, this is a procedure that should be reserved for only the most desperate situations.

Once the screw has "broken loose" from its frozen position, you can remove the gun from the vise and use your *Brownells Fixed-Blade Gunsmith's Screwdrivers* to finish removing the screw.

If you are working with a large screw slot and the blade of the *Brownells Fixed-Blade Gunsmith's Screwdrivers* is fairly thick, you can place a small adjustable wrench on the hex section of the shank for extra torque. DO NOT do this with a *Brownells Fixed-Blade Gunsmith's Screwdrivers* - whose blade is thinner than .040; even then the thicker blade may fracture, depending upon the condition of the screw.

### **How To Properly Tighten A Screw**

In most situations, extreme pressure is neither desirable, nor necessary, in securing a screw in a firearm. However, you do want to have all screws seated with sufficient pressure that they will not loosen in normal use. The most important single factor in the proper tightening of a screw is to use a screwdriver blade that fits the screw slot properly. ONLY a properly fitted screwdriver will transfer the torque necessary to tighten a screw without damage to the screw or the screwdriver blade.

In tightening a screw, apply the torque to seat the screw gradually and firmly. DO NOT attempt to jerk or "snap" the screw into place. With firm, even pressure you can and will, "feel" the point at which the screw is seated.

When the screw has been seated with normal pressure, to give it the extra tightness, use a small, lightweight hammer to gently strike the end of the screwdriver handle. The screwdriver blade must be seated properly in the screw slot. By tapping the end of the screwdriver you will normally be able to then turn the screw in  $\frac{1}{8}$  to  $\frac{1}{4}$  turn more. DO NOT strike the screwdriver with excessive force; a gentle tap is usually sufficient.

### **How To Reshape A Blade**

In the event that a screwdriver blade doesn't fit the slot, or breaks, do not worry. Virtually any screwdriver blade can be reground and reused. The *Brownells Fixed-Blade Gunsmith's Screwdrivers* are especially designed for shaping and regrinding with almost two full inches of cylindrical, parallel shank provided for regrinding.

The Fixed-Blade Shaping Stone included with your Set (or available separately from Brownells) should be used for regrinding. Place it in the chuck of your drill press; or if a drill press is not available, a variable speed hand drill secured in a vise will suffice. After facing off or squaring the screwdriver blade with a bench grinder, use the Fixed-Blade Shaping Stone to regrind or recontour the tip of the blade. We suggest that you use both hands to hold the screwdriver while regrinding, with one hand actually holding the screwdriver; the other providing guidance and steadying the screwdriver.

A speed of approximately 2000 r.p.m. should be used when shaping a new blade. If you are just thinning a blade which is a bit too thick, a slower speed of approximately 1000 r.p.m. is recommended.

In most cases, part of the "hollow grind" of the broken blade will remain on the shank even after grinding away the broken area. This ground portion can, and should be, used as a guide as you bring the blade into contact with the face of the Fixed-Blade Shaping Stone. Always grind on the face, or periphery, of a grinding wheel (at right angles to drive shaft). NEVER use the wide, flat side of the Fixed-Blade Shaping Stone, as this could cause the stone to shatter.

As you grind the new blade, start a short distance back from the tip of the blade so you will have a short parallel section at the end of the blade. Remember, the slots in most gun screws have parallel sides, not tapered, and we want the blade to match the slot perfectly. You do NOT want to have the blade tapered like a wedge or conventional screwdriver blade because it will be forced up and out of a screw slot as turning pressure is applied. It will also tend to mar or distort the top edge of the screw slot.

Grind slowly, alternating sides of the screwdriver blade so you will have an even, consistent grind. Work slowly and quench the blade frequently in water so you do not overheat the metal. If you notice the blade darkens or discolors, it is TOO HOT! In fact, you should grind off this material and start again as the blade will be much too soft from overheating.

Grinding a screwdriver blade properly takes practice. However, it is a skill that can be learned and should be employed frequently, whether regrinding broken blades or fitting blades to screw slots for that "perfect" fit.

When using a bench grinder or bit shaping stone, proper safety gear is absolutely essential. A face shield or safety glasses must ALWAYS be worn. Also, gloves should be worn to protect your hands.

If you have any questions or need any assistance with your *Brownells Fixed-Blade Gunsmith's Screwdrivers Set*, please contact our Technical Support Staff at 641-623-5401; Fax us at 641-623-3896 or by letter to: Brownells, Inc., 200 South Front, Montezuma, IA 50171. We want to serve you in any way we can.

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