Selecting the Correct Screwdriver

Dressing the Blade

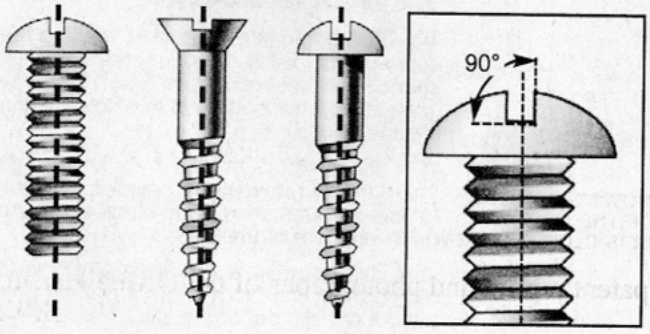
by Ken McNeil

Perhaps this sounds too basic, but a screwdriver is a tool designed for one purpose: to power a screw into a hole. It is not a chisel, it is not a pry bar, it is not a scratch tool, and there are a lot of other things that it is not.

There is no one-size-fits-all screwdriver. A mechanic friend of mine had several complete sets of screwdrivers when he worked on cars. One set was for engine and chassis work, and another was for interior cabin and trim use. Each set of screwdrivers ranged from a very narrow-width blade to the widest width to accommodate the screw he was liable to encounter. There was also an assortment of blade thicknesses, and an assortment of screwdriver lengths. This mechanic worked on Rolls-Royces and Bentleys, and he treated his tools as though they were the crown jewels.

If the right sized screwdriver is not used, it will result in stripped or mauled screw heads, screws which are not properly tightened, or scratches adjacent to the screw head from where the screwdriver slipped out of the slot.

Before we get to the tool itself, let's look at a screw head. Use a magnifying glass, if necessary, and look carefully at the slot of a new, undamaged screw. The sides of the screw slot are parallel to the center line of the screw shaft. The bottom of the slot is flat, not tapered. It is perpendicular to the center line of the screw shaft.



The tip of a screwdriver should fit that slot perfectly. The edge of the blade should be squared and perpendicular to the shaft of the screwdriver. It should not be tapered or chipped. The width of the screwdriver blade should be nearly identical, never wider than, the width of the screw slot. The thickness of the blade should fit snugly into the screw slot.

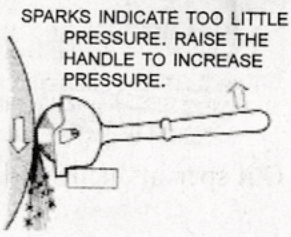
(Some sources recommend that the edge of the blade not reach the bottom of the slot, and that the blade be slightly tapered so that it 'jams' into the slot. Other sources recommend that the thickness of the blade equal the thickness of the slot, and that the blade be hollow-ground so that the blade taper nearly matches the vertical configuration of the slot walls.)

When the screwdriver fits the screw slot, you will be able to exert the maximum amount of pressure on the screw without causing slippage, damage or having the blade 'walk' out of the slot.

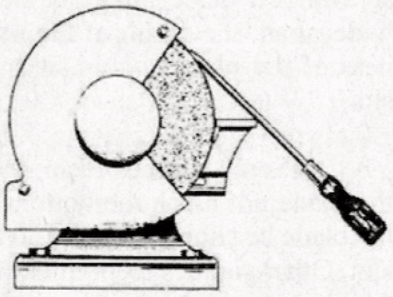
Before you pull out all of your expensive Snap-on® screwdrivers, why not practice on a cheap set of screwdrivers. As you wander through that flea market or swap meet, you will find boxes of cheap tools. You can pick up a selection of practice screwdrivers for a few pennies. If you ruin them, it's no great loss.

Again, various sources have various recommendations on the tools best suited for dressing a screwdriver blade. Some recommend a grinding wheel; others recommend a stone on a ¼" shaft that will fit a drill press. Yet others recommend hand-grinding on an oil stone. Hand-grinding is strongly recommended for jeweler's screwdrivers and other small, precision screwdrivers. We will discuss dressing a blade on a grinding wheel. The technique for a stone in a drill press is similar.

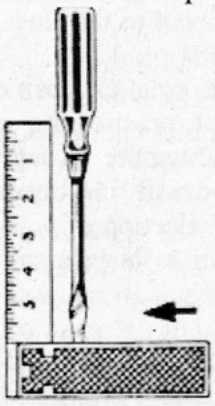
Set the tool rest so that it is perfectly square with the grinding wheel. (If the grinding wheel is worn or irregular, use a grinding wheel dresser to clean up the edge of the wheel. The edge of the grinding wheel should be flat across the width of the



wheel, and perpendicular to the sides of the wheel.) A six-inch wheel produces about the right grind on the average screwdriver used for most average-sized screws. Hold the blade high on the circumference of the wheel and rest the shank on the tool rest, or make a simple tool to keep the blade properly aligned with the wheels. See sidebar for instructions on making the tool.



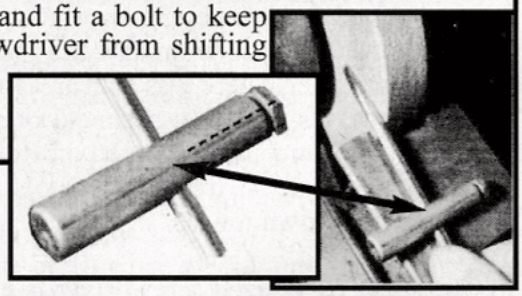
To dress a screwdriver, dress the sides so that they are symmetrical in shape. Then square off the tip of the blade. Check the squareness of the end by resting the blade on a machinist's square. The shank of the screwdriver should be parallel to the handle of the square. Grind the faces of the blade so that they are nearly parallel to each other as shown in the diagrams. The thickness of the blade should be such so that the tip just fits into the screw slot. The included angle of the faces is around 15-17 degrees. The length of the blade taper should be around 3 to 3½ times the width of the blade. It should not have any noticeable 'wiggle' or 'slop' in the blade. The screwdriver will have the least tendency to climb out of the slot when it fits properly. The general idea is that the screwdriver blade will wedge lightly into the slot and not move, ride up, or slide sideways. The tip should not extend to the bottom of the slot in the screw head. If it does, it will allow the screwdriver to slip out sideways.

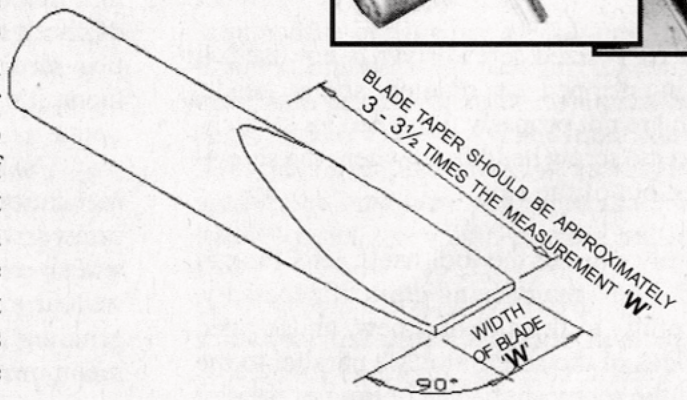


It is generally not necessary to anneal or to harden the screwdriver blade after dressing, but it is imperative that while grinding the blade not to get it too hot. Keep a can of water near the grinding wheel. If the blade gets too hot to touch, it has to be cooled. Dip the blade in the water every few seconds so that the blade does not overheat.

A simple jig for dressing any round shaft screwdriver can be constructed out of a piece of steel rod approximately twice the diameter of the shaft diameter of the screwdriver.

Drill a hole through the center of the steel rod halfway from end to end. Drill and tap a hole in one end of the steel rod from the end to the center hole and fit a bolt to keep the screwdriver from shifting when fixed in the jig.





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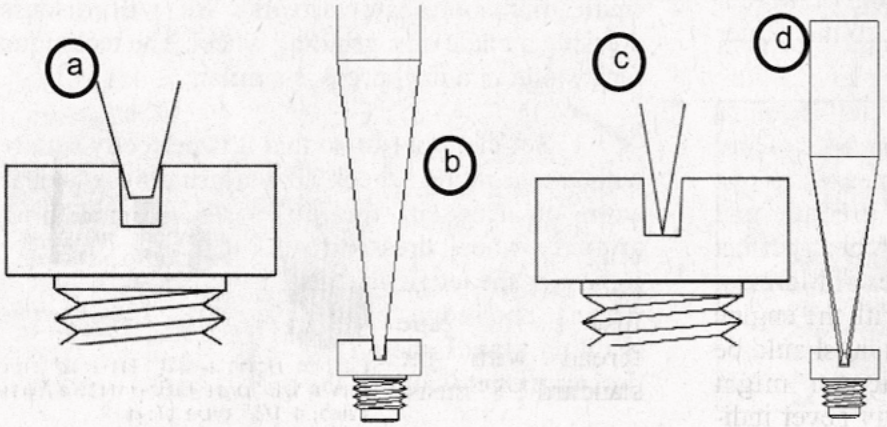

'a' - The blade angle is too steep. The screwdiver will apply force to the edges of the slot burring them up, and it will also "ride up" the slot and slip out.

'b' - The angle is too shallow, making the screwdriver weak and increasing the chance of breakage or slippage. The blade is resting on the bottom of the slot, making it liable to slip.

'c' - The blade is ground to a knife-edge point, making it weak and also dangerous to use. Also, as above, the blade is resting on the bottom of the slot.

'd' - The blade tip is not at right angles to the shaft, or the faces are not ground parallel. It will slip out of the slot.