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Dave Campbell
Editorial Content Chief, *WOOD* magazine

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How to Restore a Hand Plane

Elbow grease and basic shop supplies are all it takes to reinstate a vintage plane to its former woodworking glory.

Most of us have one or more old bench planes sitting on shelves gathering everything but sawdust. Recently, hand-tool expert and Contributing Craftsman John Olson took it upon himself to rehab one such plane—a turn-of-the-century knock-off of a Stanley No. 5 jack plane. Its design makes a nice compromise between a smoother and a jointer, and a great starter bench plane. And the No. 5 remains one of the best-selling models in history, making parts easy to find. Even if your plane isn't identical to ours, these steps improve many planes—including new-in-the-box models.

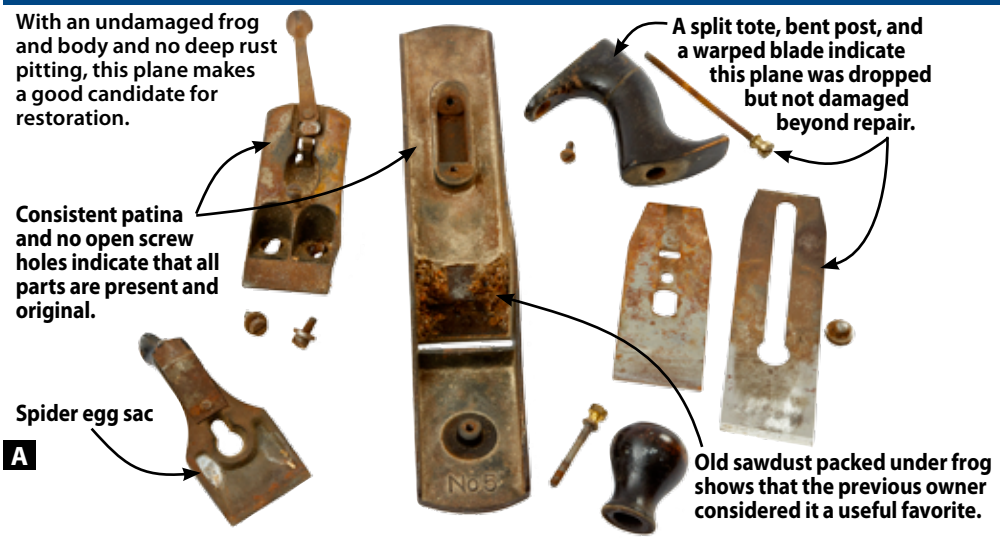
First, determine if it makes sense to restore your plane

The plane John chose to restore had only minor surface problems, but showed signs of frequent use—a clue that it had once been a favored working plane [**Photo A**]. To assess your plane, disassemble it completely and check for:

▶***Rust.*** You can remove most corrosion, so don't let it cause much concern. But if deep pitting and nicks affect the integrity of smaller parts or heavy rust has frozen screws, levers, and knobs into immobility, take a pass on restoration.

▶***Cracks.*** A hard drop onto a concrete shop floor has doomed many otherwise

THE WEAR AND TEAR TELLS A STORY



A

POWER AWAY RUST WITH CHEMISTRY AND TOOLS

Allow the rust remover to penetrate for 30 seconds before scrubbing with 0000 steel wool. Wipe clean with mineral spirits.

A rotary tool or grinder with a polishing wheel makes quick work of shining brass knobs and nuts.

A FINE KNIFE FOR DETAILED CUTS

Mask areas not getting paint; then use a craft knife to precisely trim the tape. Cut from the center, out, drawing the blade along the iron.

good planes to uselessness. If you see the telltale signs—cracks in the body near the mouth or snapped adjustment levers—forgo this fix-up.

▶***Missing parts.*** Most bench-plane parts are easy to find, either by purchasing new replacement parts or seeking out a second spare-parts plane from eBay. (See the **Drawing,** *right*, to double-check your plane's parts.) But if mounting costs threaten to make that bargain plane more expensive than a shiny new one, reconsider the restoration.

Spit, polish, elbow grease... and electrolysis?

There's really no avoiding it: Cleaning up a rusty plane requires some manual labor. John's favorite clean-up method: Work Rust Free, a rust-removal solution (Woodcraft, $12 for 8.5 oz. bottle, item #03Q57, 800-225-1153, woodcraft.com), into all the nooks and crannies with 0000 steel wool [**Photo B**].

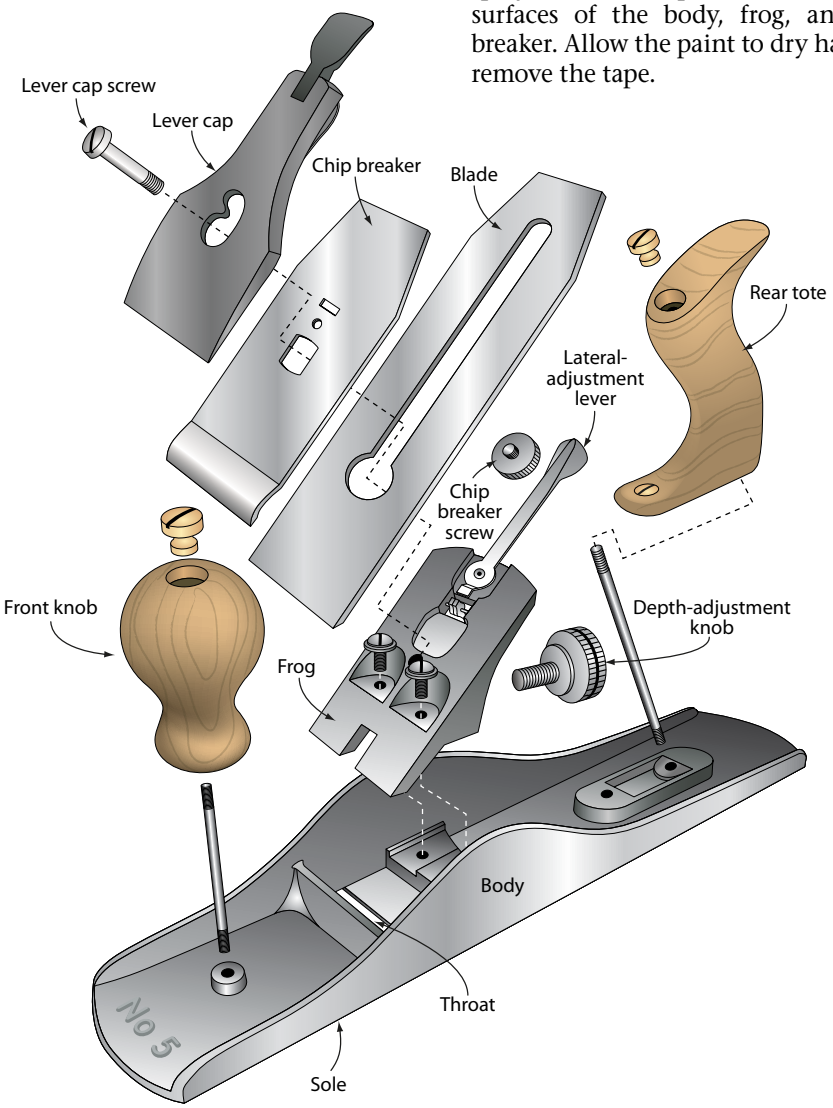
For stubborn corrosion and leftover paint, 320-grit sandpaper or a rotary tool with sanding, wire-bristle, and polishing attachments [**Photo C**] gets the job done.

If you find it slow going removing heavy rust pitting with those methods, try powering it away using electrolysis. (For a video about electrolysis, go to woodmagazine.com/rust.)

Electrolysis rust removal

Prevent rust's return by protecting with paint

Back in the day, most plane makers coated plane bodies using proprietary japanning formulas that either remain secret or lost to history. In their place, John prefers a rustproofing paint, such as black Rustoleum (rustoleum.com).



First, mask the sole and sides of the plane body, along with the protrusions where the frog mates with the body [**Photo D**]. Tape the flat areas where the frog contacts the blade and the body (and the adjustment lever, if you choose), as well as the bottom of the lever cap where it contacts the chip breaker. Then spray two coats of paint on the exposed surfaces of the body, frog, and chip breaker. Allow the paint to dry hard and remove the tape.

THE FROG GETS A BACK RUB

E

Angle the frog to avoid wear on the lever and yoke. Lap one side. Then move the lever aside to lap the other, flattening the entire surface.

Replace or repair damaged parts?

The damage John found on his plane included a rear tote that had been snapped in two and reglued unevenly—a recipe for blisters—and a bent blade that rocked when placed on a flat surface. The damage indicated that the plane had suffered a topside impact in its past.

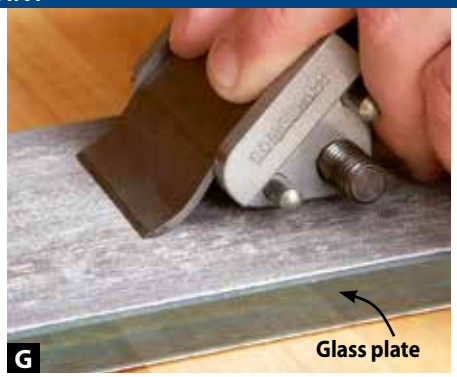
John could have repaired the tote break, and then smoothed and refinished it and the knob. However, chunks of missing wood made salvage difficult. So he opted instead to spend $40 for a replacement rosewood handle set from Highland Hardware (Item 105010, highlandwoodworking.com, 800-241-6748). Highland also carries a range of other replacement parts for several styles of planes.

Likewise, most vintage blades are easily rejuvenated with rust cleanup and sharpening. But this one was damaged beyond repair. So, John purchased a new blade from Lee Valley for $35 (item 05P31.03, leevalley.com, 800-871-8158). The $75 investment still puts the price tag far below the $125-plus price of a comparable new plane.

TIDY UP THE CHIP BREAKER'S RAGGED POINT

F

The ragged edge on this chip breaker creates gaps where shavings will wedge, leading to inconsistent smoothing.



G

With the chip breaker locked in a honing jig at an angle that mimics its curve, sharpen the end on 120-, then 220-grit sandpaper.

H

Using the edge of your workbench as an angle guide, clean up the inside of the chip breaker's curve on 120, then 220 grit.

Dissect the frog and correct the anatomy

In order for the frog to hold the blade steady while adjusting depth and angle, it must make complete contact with both the body and blade. Check this by holding the frog in position in the body: It should seat solidly without rocking or wiggling. If you feel some wobble, apply valve-grinding compound (check your local auto-parts store) to the bottom of the frog. With the body mounted in your vise, slide the frog forward and backward until it seats solidly. Clean the slurry away with mineral spirits.

Next, flatten the top of the frog where the blade rests. Apply 120-grit adhesive-backed sandpaper to a piece of plate glass, and lightly secure the glass, using your bench vise, dogs, and a sandwich of protective wood cauls. Rotate the lateral-adjustment lever aside and rub the frog along the edge of the sandpaper [**Photo E**]. Check your progress often; when the entire surface shines, switch to 220-grit paper to lap away scratch marks.

Look sharp, chip breaker and blade!

The chip breaker (not surprisingly) controls the breaking point of the shaving, preventing the wood from splitting out ahead of the wedge-shaped blade. A damaged or worn chip breaker [**Photo F**] instead creates choke points for shavings, preventing proper chip ejection and surface smoothing. Tune up your chip breaker by following the steps in **Photos G** and **H**.

SHARPEN THE BLADE

I

Sharpen the blade on 120 grit until the edge shows a single facet. Then make a few strokes each on 220-, 320-, and 2,000-grit paper.

J

Polish the back of the blade on 220-, 320-, and 2,000-grit sandpaper. Friction holds the 2,000-grit paper in place.

Next, sharpen the blade (old or new) using your preferred method. (See page *60* for some options.) Because John already had the sandpaper out, he used it to sharpen the blade at a 25° angle using 120-, 220-, and 320-grit abrasives. Then he honed it on 2,000-grit paper at 30° [**Photos I** and **J**].

CLEAN UP THE THROAT OPENING

K

File at a slight angle to relieve the material backing the throat without significantly widening the opening.

LAP AND LAP AND LAP AND LAP

L

Your body naturally tends to slide the plane in an arch, with more pressure in the middle of the stroke. You must combat this motion to avoid lapping the sole into a curve. One method: Flip the plane around while lapping. Most of your time will be spent on the coarser 120-grit paper.

NOW INSPECT

M

Check your progress often. After only a few strokes, the wear pattern begins to show the plane's hard-working history.

A LAST BIT OF LAPPING

N

With the sole completely lapped, finish by polishing out any scratch marks using 220-, then 320-grit sandpaper.

SQUARE THE SIDES

O

To square the sides of the plane, lap them while pressing the sole against a jointed piece of scrap hardwood.

Complete the refurb: Body and sole

The bowed leading edge of a Stanley-style chip breaker maintains pressure against the blade, stiffening it. But it also has a tendency to crowd the throat opening, leaving the shavings little escape. For best results, John likes to relieve the throat opening. To do this, use a combination square to mark a pencil line parallel along the leading edge of the throat opening. Clamp the body in your vise, and use a file to remove some bulk from the material backing the leading edge of the throat [**Photo K**]. Use the line as a guide to ensure the throat remains straight.

To properly flatten the sole of the plane, the plane's body needs to be under the same tension it will experience when in use. So, fully reassemble the plane, leaving the blade retracted above the sole. Then it's back to the sandpaper.

Gripped properly, your body's tendency is to move the plane in a scooping motion. While this is fine when using the plane, during lapping, it curves the sole, front to back. John suggests turning the plane backwards during lapping for a better chance at a flat sole. Follow the steps in **Photos L–O** to flatten the sole and square the sides of the body.

Finally, all that remains is a last cleanup with mineral-spirits-soaked shop towels. Coat the freshly lapped sole and sides with a light coat of paste wax to protect against reoccurring rust, and adjust your newly refurbished plane for cutting. Congratulations, you're the proud owner of a shop-ready classic bench plane!

Written by **Lucas Peters** with **John Olson**
Illustration: **Tim Cahill**

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