Restoring Old Windows

You can make old double-hungs operate as smoothly as any modern alternative — and look a whole lot better

by Dixon Kerr

A few years ago, after I'd been doing whole-house restorations for more than two decades, I started getting calls from clients who just wanted old windows repaired. At first I took on these jobs to fill in periods of downtime between the larger projects. But after I'd done a couple of them, the trickle of calls became a torrent. Some callers were simply hoping to qualify for generous new federal and state rehabilitation tax credits. Most, however, had learned to appreciate the precise joinery, wavy glass, and unique divided-light patterns that made their original windows so valuable. Now all I do is windows.

Long-neglected windows may be inoperable and unsightly, but the damage is almost always superficial — peeling paint,

All photos by Maurice Duke

cracked putty, broken glass, frayed cords, frozen pulleys — and relatively easy to fix. Most old windows in my area were crafted from long-leaf heart pine, which is a remarkably stable and rot-resistant material. Although it's not unusual to find localized outbreaks of rot, especially in end grain that's been long exposed to the weather, these areas are easily repaired with epoxy.

In my experience, once the surface issues have been addressed and the moving parts properly tuned, a century-old window will operate as smoothly as any modern unit — and look a whole lot better.

Sash Removal

Unless I'm asked to perform a minor fix, such as reglazing an otherwise first-rate window, I always remove the sash and take them back to my shop for repairs. To access the bottom sash, I cut the paint line where the window stop meets the frame. I use a small pry bar backed by a stiff-bladed putty knife to pop off the stop (without marring the frame), then cut the old sash cords and lift out the bottom sash.

Figure 1. A set of wide-mouth Vise-Grips helps extract parting bead without undue damage.

Removing the parting bead that divides the top sash from the bottom is always a challenge because it's set in a groove, so there's no easy way to slip a pry bar underneath and force it out. I've had some success using a painter's 5-in-1 as a makeshift prying device. Another strategy is to clamp the face of the bead in a Vise-Grip locking sheet-metal tool (Irwin, 800/464-7946, www.irwin.com) and yank it out (see Figure 1). Fortunately my lumberyard keeps parting bead in stock, so I don't panic if I break one from time to time.

Even though they're designed to be as operable as bottom sash, most of the top sash I encounter are painted totally shut. I separate the paint seal with a sharp utility knife (a small saw called a window zipper makes this task a bit easier — but it's another tool to keep track of, and I prefer to keep things simple). If the sash remains stuck after the paint lines are cut, I look around for the screws or nails that a previous carpenter must have installed.

Whenever I'm dismantling several windows at the same time, I mark the unfinished vertical edge of each sash with a code to ensure that it goes back in the proper jamb. Since the edges should never be primed or painted, a pencil mark is sufficient. In many cases, when I've looked closely, I've found that the original installation codes were still visible.

Frames

Before returning to the shop with the sash, I remove any paint that may have accumulated on the inside running surfaces of the window frame. I've tried dozens of paint removers over the years; my favorite is the Speedheater (Eco-Strip, 703/476-6222, www.eco-strip.com), which uses infrared light to soften paint as effectively as a conventional heating device, but at a much lower temperature.

If the metal pulleys are also encrusted with paint, I remove them and let them soak in a 1-to-1 mixture of Simple Green and ammonia. After several days, I'll rinse them with water to remove the accumulated paint.

Because they lack moving parts, window frames are much less susceptible to wear and tear than sashes; just the same, rot never sleeps in this part of the country, so I poke around every surface with a 5-in-1 to check for signs of sponginess. I treat minor infestations of rot with an epoxy repair system (System Three Resins, 800/333-5514, www.systemthree.com). Before returning to the shop, I cover the empty jamb with insulating foam board to keep out the elements, or with plywood to keep out the riffraff.

Sash Repair

Once I've decided to bring a sash back to the shop for repair, I strip it down to bare wood, then sand, prime, paint, and reglaze it. The old glass is often filthy and badly stained from decades of pollution and rainwater; since I don't want to wait until the soft new putty is in place, I give the glass a serious cleaning before I take it out. With the sash laid flat on the bench, I apply a generous coating of liquid glass cleaner, then

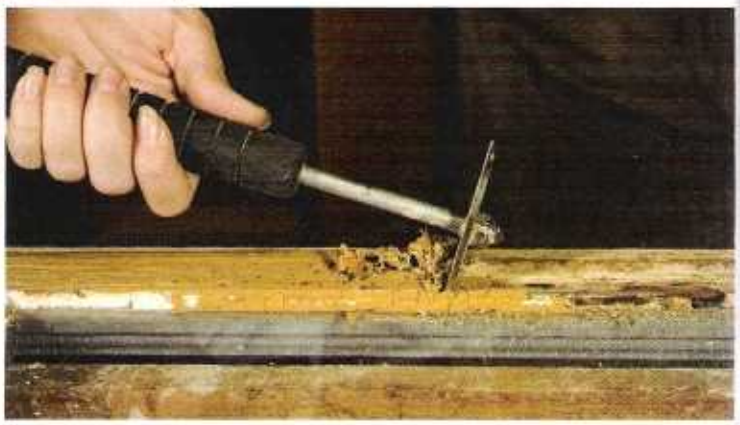

Figure 2. Placed over a heat shield to protect the glass, an infrared paint remover softens up the glazing compound and paint (left). After a minute or so, both materials release their grip on the wood and can be quickly scraped off (below). A special chisel with an adjustable guide wheel removes glazing compound without harming the glass (bottom).

run a safety razor back and forth over the surface of the glass before polishing it with a cloth.

I use the Speedheater to soften up the glazing at the same time as the paint. To protect the glass from rapid temperature swings (which could cause cracking), I cover it with a scrap of hardboard wrapped in aluminum foil (**Figure 2**). After exposing one 14-inch section to the heat for about 60 to 90 seconds, I slide the unit down the rail and scrape away the loosened paint and glazing compound. To remove the glazing compound without damaging the glass, I use an Eco-Strip chisel with an attached wheel that serves as a depth stop.

When the glazing is out, I carefully extract the glazier's points with a small pair of needle-nosed pliers. To properly prime the sash, I try to remove all the old glass panes; then I set them aside in a secure place until it's time to put them back in. I hate to break irreplaceable glass, so if a particular pane remains stubbornly bonded, I leave it and work around it.

To replace cracked or broken panes, I keep a supply of antique glass on hand, which I can cut to size as needed. Most of my stock is reclaimed from windows that were too badly damaged to save, or was purchased from a local salvage yard (which also ships by mail order; www.caravatis.com). In addition, I'm aware of two manufacturers who reproduce various types of antique glass: Bendheim (www.bendheim.com) and Artisan Glass Works (www.artisanglassworks.com).

With the glass out of the way, I repair any minor rot damage with an epoxy wood repair system. After allowing the epoxy to cure (usually overnight) and tooling the patch smooth, I lightly sand all surfaces with 100-grit sandpaper. Then I apply a generous coating of Benjamin Moore's Fresh Start — an alkyd primer suitable for both interior and exterior uses — to all surfaces except the vertical edges. I'm especially careful to fully coat the rebate (the part that holds the glass) because the glazing compound will not bond to bare wood.

Once the primer has dried, I spread a thin frosting of glazing compound on the rebate, then gently press the glass into place.

Instead of push points that stick out and catch my knife when I'm tooling the glazing compound, I use triangular glazier's points to secure the glass. With a putty knife, I push the points into the wood just far enough for them to be covered by the new putty. For small panes of glass, such as you'd typically find in a 6/6 window, one point in the middle of each mullion is sufficient. On larger pieces, I leave about 12 inches between points.

Before applying the glazing compound, I clean the glass one last time to make sure I've left no paint or putty on the surface, then apply a coating of NoStreek Glass Polish (Gel-Gloss, www.gel-gloss.com), which adds a brilliant sheen and helps repel dirt.

Glazing

Nothing is more crucial to the success of a sash repair than glazing compound. I use a professional-grade product called Perm-E-Lastic Glazing (Atlas Putty Products, 800/373-2727, www.putty.com) that spreads easier and remains more elastic than over-the-counter versions. I tool the compound with a curved putty knife — technically called a 35-degree bench glazier — which I find easier to control than a straight-bladed knife, especially when working in corners. I bought mine online from a supplier of glazing products, but it took a bit of searching (Ro-Don, 800/829-0687, www.ro-don.com).

To keep glazing putty from sticking to my fingers, I dust them with a light coating of plaster of Paris. Starting at a corner and holding a ball of putty in one hand, I tear off thumb-sized chunks and press them roughly in place with my fingers (**Figure 3**). When one side of the sash is fully loaded, I place the clean knife blade in a corner and hold it at an angle steep enough to ensure that the edge of the putty won't be visible from the other side. Then, using pressure from my forefinger to hold the knife blade tight to the edge of the rebate, I draw the blade smoothly from one side to the other.

To ensure that the putty stays smooth and doesn't pull out, the knife should be absolutely clean and free of pits. I've found that a light spritz of WD40 also helps.

After trimming away the excess putty, I roll it back into the ball and move on to another section. When all the sash have been reglazed, I set them aside to cure for a few days. The glazing compound I use skins over enough to accept primer in as little as 24 hours, but the longer drying time means fewer brush marks in the still-soft putty.

I put a second coat of primer on the exterior faces and follow that with a coat of paint.

Saving Energy

The easy way to make antique windows more energy-efficient is to add storm windows. Lots of low-profile storms are available these days

Figure 3. Holding a ball of glazing putty in one hand, a worker tears off manageable chunks and presses them in place with her fingers (above). When one side of the sash is fully loaded, she tools the compound smooth with a glazier's curved putty knife (right).

that can be installed from the inside or the outside. I've also had good luck retrofitting sash with weather stripping. Instead of the spring bronze systems that are a nightmare to install, I use an assortment of silicone beads and nylon pyle (brush-type) weather seals; they snap into narrow grooves that I rout into the surfaces of the sash with a specially designed slot-cutting bit (**Figure 4**).

All these products are sold by Resource Conservation Technology (800/477-7724, www.conservationtechnology.com).

Restringing the Sashes

Unless a client specifically asks me to fix the top sash in place, I prefer to make both sash operable. This feature is particularly welcome on cool summer nights, when opening both halves allows the air to circulate freely.

Whether I'm restringing both sash or just the bottom, the procedure is the same. I open the covers that allow access to the weight boxes and cut the old cord from the sash weights. If the weights are missing, I weigh the sash with a hand-held fishing scale, then divide by 2 to determine the correct replacement size (old window weights are usually coded at the top with Roman numerals, so a 6-pound weight would be marked "VI").

I fish the new cord through the pulley by attaching it to a 5-foot length of string with a lead fishing weight on the end (**Figure 5, page 103**). Sash cord is available in a variety of sizes and strengths; for residential windows, the stuff I use is rated for a working load of 94 pounds.

I loop the cord through the hole in the weight and tie it with two half-hitches, leaving a few inches of slack pointing upward. To prevent any future snags, I crimp the loose end back onto the cord using a hog ring. Next I pull the cords as high as they'll go and secure them with a spring clamp. Placing each sash in turn at the bottom of the jamb, I cut the cord about an inch below the knot mortise in the edge of the sash and tie it in a simple overhand loop. When both sides are done, I remove the clamps and operate the sash to make sure it enjoys full range of motion. If the weights bottom out or catch on the pulleys, I retie the cords and try again.

Figure 4. The author prepares a sash to receive weather stripping by routing a 3mm groove into the mating surfaces of the sashes (top). After the sash is fully primed, horizontal surfaces — such as the meeting rail shown above — are fitted with silicone bead. On the exterior of each sash, vertical surfaces are fitted with brush-type weather seals, which seal tightly to the stops but don't interfere with opening and closing.

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Figure 5. A weighted string helps the author fish new sash cord over the pulley and down to the bottom of the weight box (left). He secures the cord to the sash weight with two half-hitches, then captures the excess cord with a hog ring to prevent it from ever getting snagged in the cavity (center). To allow plenty of slack for attaching cord to sash, he pulls the weight to the top of the cavity and clamps the cord (right).

Once I'm satisfied with the length of the cords, I secure each to the sash with two copper roofing nails — one through the knot, the other about two inches above the first.

Before fastening the cords to the lower sash, I temporarily remove the sash so that I can replace the box covers and the parting bead. I secure the parting bead with 1½-inch hardwood trim nails (Maze Nails, 800/435-5949, www.mazenails.com) spaced approximately 24 inches apart. If there's a noticeable gap between the bead and the frame, I cover it with a light bead of caulk.

Next, I replace the stops. First I make sure that any paint on their inner edges has been scraped off. Then I hold each one snugly against the bottom sash and tack it with the same nails I used for the parting bead. I don't drive the nails home until I'm satisfied that the window operates as smoothly as any modern unit (**Figure 6**).

After all the stops are in place, I rub a block of paraffin wax along the channels of the window frame to provide lubrication.

***Dixon Kerr** is a restoration contractor in Richmond, Va., and the co-founder of the Alliance to Conserve Old Richmond Neighborhoods.*

Figure 6. A restored double-hung's authentic divided lights and period glass are visible even behind a storm window. With occasional maintenance, this unit should serve faithfully for another century.