

On the Job

Smooth Window Replacement

by Emanuel Silva

In this article I'll describe the method I use to install replacement windows — a method developed over 15 years and hundreds of windows. In general, replacement windows should lower a home's heating and cooling costs, improve comfort, and reduce street noise. But that wasn't the case when the windows on the house shown here were replaced 20 years ago. For starters, the double-hung replacement units were installed out of level, which put the sash out of alignment and allowed air leaks. The fiberglass batt insulation packed in around the frames was also leaky. Worst of all, when I removed the units, I found that the original sash weights had never been removed, leaving the pockets uninsulated. I knew I could get rid of the drafts

the customer was complaining about — and leave her with much nicer windows as well.

I use Paradigm windows, which are made in Maine (paradigmwindows.com, 877/994-6369). They come with two sash locks instead of one; this provides a tighter seal between the sash. I use the company's optional two-piece sill adapter, which snaps into the window frame and requires no cutting — you just slide the bottom piece down to fill the gap between the sloping sill and the bottom of the window frame. This is a lot faster than having to mark and cut the one-piece adapter, especially on the old homes I work on, where the sills are often out of level. The top of the window has a similar head expander,



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Next I provide a level bearing across the sill by using screws as shims (4, 5). For a typical unit, I'll use three screws, one in the middle and one about an inch from each end. For good measure, I check to make sure the sweep on the sill expander fits in between the exterior casings — sometimes it needs to be trimmed. I then apply a generous bead of caulk to the back edges of the casing (6) and to the sill, filling the gaps at the base of each jamb and caulking between and on top of the shim screws (7).

At this point I prep the window for installation by tapping in the bottom expander and insulating the hollow extrusion as much as possible with low-expansion spray foam. I do the same with the top expander (8) before fitting it to the top of the unit. Finally, just before setting the window I spray a bead of foam along the sill (9). The foam air-seals and also helps secure the unit in the opening.

I tilt the unit into the opening (10), then make sure I have an equal space on both sides, usually about 1/4 inch. Because I've already set the shim screws, I know that the window is level along the bottom. Next I plumb one side, then the other, starting with the bottom installation screw (11), checking and rechecking for plumb (12),

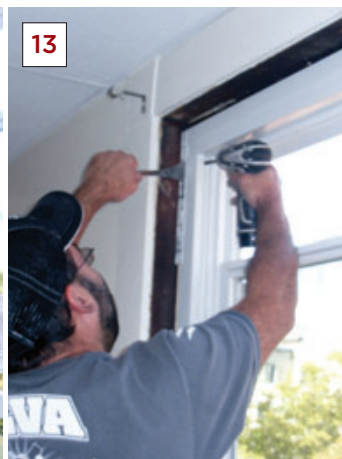
which fits over the top of the frame and slides up to fill the space between the top of the window frame and the head jamb.

After removing the old units, I take out the weights and pulleys (1) and insulate the cavity. I cut some fiberglass insulation to size, then use a strip of flexible metal

to push it up into the pocket from the bottom access opening until I can see it at the top (2). I pull the batt material back down snugly against the bottom of the pocket and fill the top of the pocket with small pieces. I replace the pocket covers, then cover the holes with foil-faced tape (3).



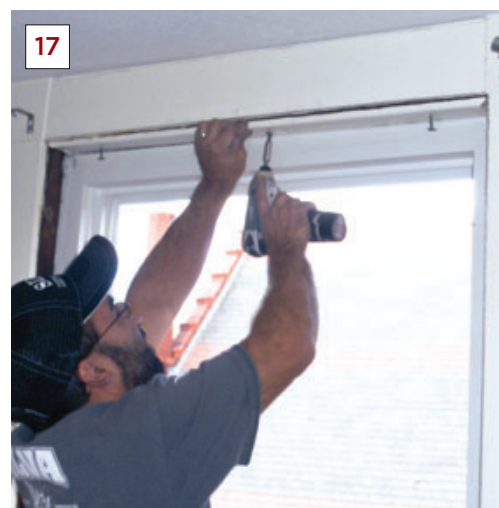
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and making adjustments as needed (13).

When I think both sides are plumb, I double-check by opening both sash about 1/2 inch and eyeballing the gap to make sure the edge of each sash is perfectly parallel to the frame. Once I'm confident the frame is plumb, I screw in the adjusting screws located halfway up the sides of the frame (14), then install the final installation screws. After opening and closing the window a few times and checking that the sash tilt out properly, I push up the top expander until it's about 1/4 inch from the existing jamb (to leave a gap for foam), then snap in the guide sleeve that covers the top screws (15).

Before I reinstall the stops, I spray foam insulation around the entire unit (16). I've learned over time that it seals better if you leave that 1/4-inch gap around the frame for the foam to expand into, rather than butting the frame tight against the jamb. Reapplying the stops as the foam cures saves me a step because I don't have to shave off the excess foam. I start with the top (17), then do the sides, often springing them into place to get a snug fit. I always predrill the holes in the stops; using screws with finish washers adds a nice touch and makes it easy to pull off the



stops in the future.

The last step is to caulk any and all gaps (18); I use a siliconized acrylic for easy cleanup, tooling the joints with a wet finger and a damp rag. Afterward, all that's needed is a little touch-up paint (19).

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