# Choosing and Using Wall Jacks

Costing less than last month's truck payment, these jacks enable small crews to lift walls that weigh a ton or more

BY JIM BLODGETT

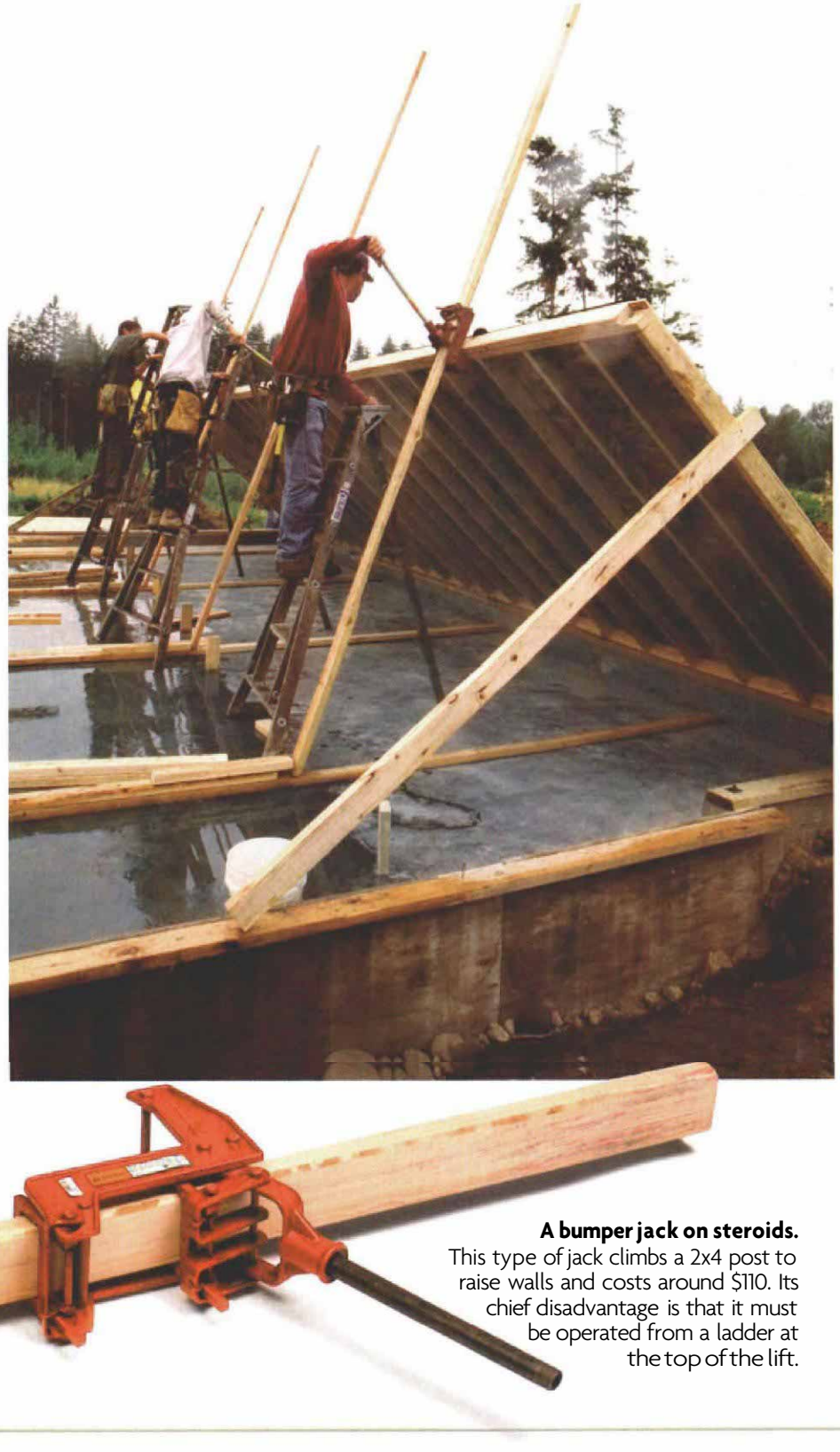
I moved to the West Coast during my mid-20s and quickly found that the building basics I'd learned in New England no longer applied. For example, framing and siding walls flat on the deck, then raising them with windows and doors in place, was new to me. I didn't let on, though, and kept my head down and my hammer moving. By the middle of my second day framing, the front and back walls were framed, sheathed and sided. "Wait a second," I thought. "How are we going to lift these monsters?"

Just then, the boss told me to pick out four clear 2x4s, 14 ft. long. "Try to find some with tight, straight grain," he said. As I picked through a sling of lumber, another carpenter emerged from the back of the truck carrying wall jacks, hardware that I'd never seen before. The wall jacks slid onto the 2x4s, and to my amazement, they raised these heavy walls in about 15 minutes.

### Price and convenience differentiate the two common types of wall jack

Twenty years later, I still depend on these simple tools to lift walls that weigh thousands of pounds. Pumping a lever actuates a mechanism similar to a scaffold pump jack (photo right). This action

TWO TYPES OF WALL JACKS



**A bumper jack on steroids.** This type of jack climbs a 2x4 post to raise walls and costs around $110. Its chief disadvantage is that it must be operated from a ladder at the top of the lift.

**Pricier, yet arguably safer.** Each Proctor jack costs $350. A come-along, whose cable passes over a pulley atop the jack's adjustable mast, raises the walls. This system keeps the operator on the ground, out of the path of a falling wall.

walks the jack up the 2x4, lifting the wall in the process. Flipping a small lever and repeating the same pumping motion lowers the jack. Every framer I know has a couple of them; most have three or four. Where I live, part-time framers can rent them for $9 a day per jack.

There are two disadvantages to this type of jack; both spring from the fact that the jack itself attaches to the top plate of the wall. As the wall goes higher, so goes the jack, and the operator eventually has to work from a stepladder. Also, as the wall rises, the operator has to move within the arc of the wall (photo facing page). Should a jack or post fail (something that I've never seen happen), the operator stands a chance of being crushed.

A second type of jack, manufactured by Proctor, avoids these problems (photo left). Proctor wall jacks have a 16-ft. telescoping steel mast with a pulley on top and a hinged plate on the bottom. With the plate fastened to the deck, the wall is raised by means of an integral hand-operated winch, or come-along, mounted about waist high on the mast. The cable from the come-along runs through the pulley on top of the mast. A steel plate on the cable's end is nailed to the top plate of the wall. An adjustable stop block on the pulley end of the mast keeps the wall from going past plumb as you raise it. The operator never moves from the start position as the wall rises.

Proctor wall jacks are rated to lift the same weight, 1000 lb. per jack, as the pump jacks I'm used to. The Proctors seem easier and smoother to use, but at $350 each, I don't do enough framing these days to justify buying a set. I can, however, rent them for $18 a day.

## How many jacks do you need to lift a wall?

It doesn't take long to get a feel for when to use two jacks and when to use three or four. I'll give you an example. An 8-ft.



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tall by 40-ft. long wall with six 4-ft. by 3-ft. windows, sheathed with oriented strand board (OSB) and sided with fiber cement, weighs about 3600 lb. Because the jacks are lifting only about half the weight of the wall (the rest of the weight is on the bottom plate), you might get by using two jacks in this case, but it would be chancy. I'd err on the side of safety and use three.

If I were lifting a light but long wall, I might still use an extra jack, just to minimize the racking that can occur when long walls are being lifted.

Post length is another consideration. If the posts are too short, you'll run out of post before you run out of lift, and there you'll be with a half-raised wall—not good.

Pythagoras can help here, with his theorem that $a^2 + b^2 = c^2$, where $a$ and $b$ are the legs of a right triangle and $c$ is the hypotenuse. In the case of an 8-ft. wall, the equation would be 64 (8 x 8) + 64 (8 x 8) = 128. The square root of 128 is a little more than 11. I round up and add a foot so that the post will extend beyond the top of a raised wall. Using an 8-ft. wall as an example, I'd use at least a 13-ft. 2x4.

## Slabs and wood floors call for different jack setups

On a typical project, I start by framing the two longest walls. After nailing the studs and plates together, I fasten the bottom plate to the deck on the layout line with a toenail every 32 in. (photo top left). These toenails bend as the wall is lifted, providing a pivot point and keeping the bottom plate from kicking out.

Next, I square the wall, sheathe it and install the tar paper or housewrap. I also install the windows, doors, siding and any exterior trim that I can. I always extend the plywood or OSB past the bottom plate so that when the wall is raised, the sheathing laps the rim joist and mudsill. I omit the bottom courses of siding and leave the tar paper unstapled so that the sheathing can be nailed to the floor assembly (photo top right).

With a crowbar, I lift the wall high enough to slip blocks under the top plates to make room for the jacks. It is critical to place jacks between studs and away from headers. My jacks are molded with a hook that cradles the two top plates. You can start if the jack is directly under a stud or header, but as the wall's angle changes, the jack could slide along the framing member and fall off the wall.

It's also a good idea to balance the load between the jacks. For example, if I were raising a 20-ft. long wall using two jacks, I would set each one about 5 ft. in from the wall's ends and have 10 ft. between the jacks, centering each on half the wall. On a wooden floor, I make certain that the bottom of each jack post rests over a joist. I nail blocks to the deck behind the base of each jack post to prevent it from kicking out.

When raising a wall from a concrete slab (a garage, for example), I temporarily lay 2x4 sleepers flat on the slab, perpendicular to the wall to be raised (bottom photo). I fit these sleepers tightly between the stemwalls or mudsills, nailing two or more together so that they can't slide. The anti-kick-out blocks are then nailed to these sleepers.

After I've raised the two long walls, I frame the end walls. To tie the walls together, the end walls' sheathing must overhang the last studs and lap the corners of the long walls. However, these end walls must be built and raised between the long ones. This means that I must omit the last overhanging pieces of sheathing. And it means that I can't side the end walls either. So I sheathe and install what windows and doors that I can, and finish up after raising the end walls.

## What if a jack fails?

The walls are framed, the jacks are in place, the anti-kick-out blocks are nailed down, and the crew is anxious to get the wall vertical. Are we ready to lift? Not quite. The next step is to think about bracing and jack failure.

I have never seen a jack fail. It's not hard to imagine, though, so I take precautions. Before lifting a wall, I make sure there are a couple 2xs at the foot of each post, one 4 ft.

### WALL-JACK SETUP

**Toenails keep the wall's plate from kicking out.** With the bottom plate on the layout line, the author toenails the plate to the subfloor.

**Leave off the bottom siding courses so that the sheathing can be nailed.** The sheathing hangs below the wall plate to lap the mudsill or rim joist.

**A scrap block keeps the jack post from kicking out.** When working on a slab, the author fits 2x4s snugly between the mudsills or stemwalls. These 2x4s provide nailing for the anti-kick-out blocks.

## WALL-JACK OPERATION

**Jacking walls calls for coordinated effort and forethought.** To avoid racking the wall, the crew works the jacks in unison (photos left). Once the wall is raised, it must be braced quickly (photo above). Two 16d nails positioned this brace during the lift to speed attachment. The brace pivoted on the first, which was driven through the brace into the stud end. The second, in the rim joist just below the brace, supported the brace so that its bottom ended up positioned as shown in the photo above.

long and one 6 ft. If something goes wrong, these 2xs can be placed under a partially lifted wall as a temporary support.

Once the wall has been lifted, braces must be used to keep it from going over or blowing back down in a stiff wind. I always brace both ends of a wall, as well as about every 8 ft. to 10 ft. in its middle.

To speed bracing the wall ends, I drive a single 16d nail through a 2x brace into the corner stud about three-quarters of the way up (photos top left). I start another nail in the rim joist a few feet back from the bottom plate. The free end of the brace slides along the lower nail as the wall is raised, and when the wall is upright, the brace is close to the perfect 45° attitude. Once the wall is slightly past plumb, I nail the bottom of the brace to the rim joist (photo above right).

An exterior wall of any length needs more than end bracing. I always have a few braces ready, along with blocks to nail them to. Once the wall is vertical, a crew member can quickly nail these braces while others nail off the bottom plate and the sheathing.

### The wall must be raised evenly

The last step before lifting the wall is checking that there are no stray tools, anchor bolts or debris in the way. Sweeping where the wall will sit is also a good idea. Anything beneath the bottom plate of a 3000-lb. wall will be mighty hard to get out later.

I always pay close attention as I start to raise the wall. If the wall flexes out of plane or if one jack is working noticeably harder than the others, I back down and reposition the jacks.

The crew needs to work the jacks in unison, lifting the wall so that the framing won't twist or put too much weight on a single jack (photos top left). As the weight shifts from top plate to bottom plate, gravity stops fighting the lift and starts helping. I usually finish the lift by hand.

After the wall is lifted and temporarily braced upright, I check to see if it is still on the layout line. Then I nail down the plate using 16d nails every 16 in. I nail right next to the studs, leaving the middle of each plate clear of nails that could chew up the plumber's or electrician's drill bits.

I'm convinced that wall jacks save me time because I can frame, sheathe and side walls on the deck. Even if this weren't the case, the added safety of lifting mechanically is worth it. No more do I do the clean and jerk while lifting walls, and my back and knees are the better for it. A recent story on "Breaktime," *Fine Homebuilding*'s on-line discussion board, drove home the immediate danger of lifting walls. Part way through raising a wall, a crew realized they couldn't finish the lift and let the wall go. It landed on one unfortunate fellow, whose pelvis is now held together with a steel pin and whose carpentry career is done. Jacks would likely not have allowed that wall to drop. □

### Wall-jack manufacturers

Proctor Products
(425) 822-9296, www.proctorp.com

American Manufacturing Inc.
(888) 586-9000
www.american-mfg.com

QualCraft
(781) 344-1000, www.qualcraft.com

Olympic Foundry
(206) 764-1200

Jim Blodgett owns A Small Woodworking Company in Roy, Washington. Photos by Andy Engel.