



Sure-footed Sawhorse

Of the many lessons home improvement projects have taught me, one of the most enduring has to be a respect for gravity. The "instructors" have come in various guises, from

> annoying paint runs to a serious fall from a ladder, but a pair of collapsing sawhorses once drove the point home unmistakably.

> In the interest of saving time and money, I bought a set of metal sawhorse brackets and nailed them to 2x4 legs and crossbars. It was obvious from the start that these sawhorses weren't very

rigid, but I just wanted something "quick and dirty." And that's exactly what I ended up with. After I stacked a few dozen plywood cabinet sides into a towering load on the horses, I reached to shut the table saw off. As the whir of the blade faded, I heard an ominous creaking sound — the kind nails make when they're saying goodbye to wood — then turned to watch the entire stack of material tumble onto the floor as the sawhorses collapsed.

At first I blamed the mishap on cheap hardware, but the fault was really mine. I took those beasts of burden for granted, mistaking their simple task for an easy one. Nowadays I pay a lot more attention to sawhorse design. My latest model has some of my favorite features — a replaceable top plate, a lower shelf for keeping my power tools off the ground, and knockdown construction for portability.

The fundamental requirement, of course, is to hold a lot of weight safely. All good sawhorse designs meet this goal head-on, and several techniques help out here — cutting deep notches for interlocking lap joints, using bolts to cinch the assembly tight so the knock-down feature won't mean a sloppy fit, and laminating some key parts with hardboard to avoid stress failures along the wood grain.





PROJECT SUPPLIES

A kit has been assembled for this project. It includes the knobs, screws, nuts, bolts, and washers for making two sawhorses. Order number 3304200 To order, call Workbench at (800) 311-3994.

Make The Laminations First The glue on the laminated components needs time to set, so start with those first. Each pair of horses requires four rails. If you can find reasonably flat 2x10 Douglas fir, it's simpler to laminate the hardboard onto the full width (Figure 1), then rip the individual pieces to size (Figure 2).

You'll also need to laminate some additional stock for the gussets. Again I used an oversize blank so I could cut the assembly to size later. The small size and angled ends of the top gussets don't leave much room to cut the notches safely (see the Gusset Details), so I drew layout lines for each pair onto a single wide blank, alternating the angled edges. This saved material and allowed me to cut the notches before sawing the gussets apart. The bottom gussets, on the other hand, are larger and easier to handle, so I went ahead and trimmed their ends at a 15° angle. A simple jig fastened to the table saw's miter gauge helped control the cut (Figure 3).



When you laminate the hardboard skins onto the rail and gusset stock, use clamping cauls to distribute the pressure evenly.



Rip the rails from the oversized glued-up blank. Cupped or twisted stock may require multiple passes to produce square edges.



With a simple positioning jig fastened to your miter gauge, you can safely trim the ends of each gusset at a 15° angle.

Deep Notches Are Next

With all the laminated parts glued up and cut to size (except the top gusset blanks), you can cut the notches for the interlocking joinery. The 2" depth is beyond the reach of most dado blades, including mine, so I just made multiple passes with a standard 10" blade. Each pair of sawhorses requires 16 of these notches - not really enough to warrant building an involved jig, but more than I wanted to mess with for layout marking. I avoided both chores by first cutting the inside and outside shoulders of each notch using the rip fence as a stop, then I moved the fence away and cut the rest of the waste (Figure 4). After you machine the notches in your top gusset blanks, cut them apart using the same jig you used to trim the angled ends on the bottom gussets.

About halfway through this project I did some head-scratching over whether a glued-up block of ³/₄"-thick plywood would have been better material for the gussets. As it turned out, the 2x stock covered with 1/8" hardboard is plenty strong, and keeping the stretchers and gussets the same thickness makes cutting the notches simpler. If you really want to build in more beef, you can laminate a plywood sandwich and hardboard skins together for the best of both worlds - added strength and stability plus consistent dimensions.

Drill for Hardware

After I tested the joints for a snug fit, I set up my drill press to bore holes for the knock-down hardware. For me, this feature is the icing on the cake, because it locks everything together tightly but doesn't forfeit portability.

Start with the stretchers, which must be counterbored for the bolt heads and the T-nuts (Figure 5). Then drill a 3/8" through-hole for the bolt shanks. The counterbore inside the center of each notch, where the T-nut nests, is more of a





 γ_{10} bolts



Positioning the rip fence as an end stop lets you make the outside cuts for the notches; a few cleanup passes finish the job.



Counterbore the stretchers so the bolt heads and the T-Nuts will nest below the surface, then drill for the bolt shank.



shallow relief, just enough to let the metal flange of the T-nut retreat below the wood surface. The gussets don't need the counterbore treatment, but you will need to drill $a^{3}/8^{"}$ hole down through the center of each one (see the Gusset Details on page 2). I used the stretchers as a drilling guide by fitting the pieces together and continuing the hole with a portable electric drill. With a standard-length drill bit, you'll have to drill as deep as you can, separate the pieces, and finish the hole through the gusset alone. While everything's apart, you can also add details like the beveled corners and jig-sawn contours on the stretchers (Figure 6).

After you tap the T-nuts home in the stretcher notch, you can thread the bolts through, cinch them tight, and they'll stay captive whenever you disassemble the sawhorse. In case you didn't notice already, this step will remind you that the $\frac{5}{16} \times 6^{"}$ through-bolts have to be threaded along nearly their entire shank. A well-stocked hardware store or fastener supply house will usually carry these in either a hex-head or slotted-head version, but if they're scarce where you live, the Project Supplies kit on page 2 has them packaged



The cloud-lift contour on the rails can be cut with a jig saw, or, since they're nonfunctional, left out of the design altogether.

with all the other necessary hardware for the sawhorses.

Cutting 2x4 stock for the legs and top plate is straightforward. Just remember to cut the top and bottom ends of the legs at a 15° angle to allow for the splay when they're assembled. The splayed stance, along with the interlocking notches, is what makes these sawhorses stable and sure-footed.

Assembling the A-frames

Corrosion-resistant deck screws and exterior glue (either an outdoor yellow glue or a polyurethane adhesive) keep the legs secured to the gussets. Chances are, if I'm working outside and get caught in a sudden downpour, I know I'll be rescuing power tools first, so I don't want to worry about the sawhorses getting a little wet.

My first assembly attempt was a little awkward, especially trying to place the gussets accurately on the inside faces of the legs. To compensate for the offset in material widths, I ripped a couple of $7/_8$ "-thick spacers to prop the gussets off the surface of my assembly bench (Figure 7). This centered and aligned the gussets while I drove the screws home. If glue and a good grip won't keep the gussets from shifting, clamp some stop blocks just below the gussets.

Once the glue dries on those assemblies, the sawhorses can go together. Fit the stretchers into the A-frames, then crank the wing knobs to lock everything together.



A pair of ⁷/8"-thick spacers will help align and center the gussets while you're assembling the A-frames. Use exterior glue here.

Next, cut the plywood shelf to size and fasten it to the stretcher with five 1⁵/₈"-long decking screws.

Mounting the top plate calls for a little variation on that theme (see the Top Plate Mounting Detail). The plate's

likely to get cut up a bit, and I didn't want to ruin a saw blade on exposed screw heads. I gave myself some leeway by counterboring a 1/2"-diameter hole about halfway through the plate, followed by a clearance hole for the screw shank. Then I ran some pan-head sheet metal screws through the top plate into the rail. The plate can be replaced if it gets chewed up over time, but the chances of a saw blade colliding with a screw head are a lot lower.

As for the contour on the underside of the stretchers, I thought it might save some weight and give me a little extra room above the shelf. One of my woodworking buddies ribbed me about it, saying he'd never seen an authentic Arts and Crafts-style saw horse, complete with cloud-lift motif. But after he borrowed them one weekend for a building project, he dropped the sarcasm long enough to tell me what I already knew — this is one trick pony. **7**

Top Plate Mounting Detail

