

## Do-It-Yourself- Hydraulic Press– Make Your Own, by Marshel Rossow

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This press can be built from readily available metal. Materials and dimensions need not be exactly what is shown here. Much of the material was used simply because I had it available. The main thing to keep in mind is that whatever material is used must be strong enough to withstand the pressure applied. It's better to overbuild than to skimp. Tack-weld everything together to be sure it all works, then go over it again with the final, heavy welds. Also, you'll want your hydraulic bottle jack on hand before you start building. You may have to alter the suggested dimensions to fit the jack (I started with a 6-ton jack, and then upgraded to a 12-ton jack in my press, which was simply a matter of changing the retraction springs as explained below.).

### **Press Frame**

The frame I built was constructed of 20-inch rectangular tubing with 3/16th-inch wall thickness; it's what I had on hand. You could also use channel iron, or even angle iron welded together along the edge to form a channel. The uprights are 54 inches long; the top piece is 23-3/4 inches long. These sizes are practical for most purposes but are not cast in stone. You could build a bench-top press by shortening the uprights. I mitered the corners because it gave a finished look, but you could get an acceptable result by simply setting the cross piece on the uprights and welding them together. If you're not totally confident in your welds, you could increase strength by bending and welding a piece of flat strap around each corner or welding gussets into each corner.

Drill the uprights before welding them to the top piece. I drilled my first hole about 18 inches from the top, then succeeding holes 4 inches apart until I was about a foot or so from the bottom. I drilled 3/4-inch holes for 3/4-inch rods on which the press bed sits. Bigger rods would be great; I wouldn't go much smaller or they'll bend under pressure (If you don't have drill bits big enough, consider what Harbor Freight offers. You can get a set of bits up to 1 inch for less than 20 bucks.).

Between the bottom ends of the upright, I welded 1 x 2-inch rectangular tubing to keep the uprights from spreading (I kept the tubing up about an inch from the bottoms of the uprights.).

I drilled and bolted 2x2 angle iron, 21 inches long, on the outside bottom of each upright to serve as feet to keep everything from tipping over. Size and length of the angles are optional—they just happened to be what I had lying around. You could weld them onto the uprights, but bolting them on means you can take them off and store the entire press in 3 inches of space out from the wall.

See sketch for the guide pieces near the top of the uprights. These pieces simply serve as a channel to guide the jack support and keep it in place. I used 1-inch flat stock, 12 inches long, set on edge. You could also use 1x1 angle iron.

Weld them only on the outside edges so the welds don't interfere with the guide bars on the jack support.

The sketch may not make it clear, but on the under side of the top piece of the frame, I welded a piece of 3 x 12 x 1/2-inch-thick steel to strengthen the frame. That's where all the jack pressure is concentrated, and I didn't want anything to bend. On this 3x12 piece I welded a

short (1/2-inch long) piece of pipe into which the round top of the jack "nests." This piece reduces the danger of the top of the jack slipping out when under pressure.

I drilled two 3/8th-inch holes through the top of the frame, as shown, for eyebolts. I used 4-inch eyebolts, but you could use longer or shorter as needed to adjust things to fit your jack.

That's basically all there is to the frame.

## **Jack Support**

This is a simple piece to build -- you just need something on which the jack can sit. I used a 17-3/4 x 4 x 1/2-inch-thick piece of steel. Narrower (e.g., 3 inches) would work, and 3/8-inch thick would be OK. The key thing to remember here is that the support, once the guide pieces are welded on must fit within the guide channels on the two uprights. Size your piece accordingly.

The guide "pins" on the support are 1 x 1 solid square stock, 5 inches long. Weld them on as shown on the sketch. They slide up and down in the guide channel (as described on the previous page) when the jack is raised and lowered. There's no real pressure on them -- they just keep everything in place. You could use other material than suggested -- a piece of pipe or solid round rod would work, too. (See? This is what I mean about using whatever you have lying around.)

Drill two 3/8th-inch holes in the support plate the same distance apart as the holes you drilled in the frame top piece. Then put two eye bolts in the holes.

Now hang the jack support in the frame, using fairly heavy coil springs. The purpose of the springs is to automatically retract the jack when its release valve is opened. I tried buying springs at a hardware store, but they weren't strong enough to pull the jack back up. The best thing to use is hood springs from a car from the mid 1970's or earlier. I used 1975 Nova hood springs (about 9 inches long), but lots of others would work, too. When the hood is open, you can pop the springs out reasonably safely with a big screwdriver. (If you have access to cheap springs in a salvage yard, pick up two or three sets of different lengths. That will let you easily use jacks of different lengths if you want to. You can also do some adjusting by using longer or short eyebolts.)

At this point, the only thing missing is the bed.

Press bed. The press bed is the easiest piece to make. Take two pieces of 3-inch channel iron, each 24 inches long. Set them back to back, as shown in the sketch, with about 3-1/4 inches between them. (The exact distance apart should be slightly greater than the width of your upright material, which in my case was 3 inches.) Then weld a strap of flat steel (I used 1 inch, but wider would work) across the ends as shown to attach the two pieces to each other (and to serve as lifting handles). That's all there is to the bed. Now slide a couple of 9-inch pins through the holes you drilled in the frame uprights and slide the bed assembly down over the frame so the bed rests on the pins. (Oops! I guess you'll have to remove the jack support to do this.)

Now, if everything fits, you're ready for the final welding. Make sure you get good penetration on all the welds. You don't want things coming apart under pressure.

To actually use the press, you'll need a few short (i.e., usually 2 or 3 inches long) chunks of pipe or, better yet, solid round stock. I've collected pieces ranging from 1/2-inch to about 3 inches in diameter. This variety will let you press things of various sizes. Just set the item to be "pressed" on the bed, set the short piece of pipe on the part to be pressed out, and start jacking. You may want to find a couple of pieces of thick plate to use as arbor plates to sit on the bed. I use a couple of chunks of 3 x 9 x 3/4-inch thick steel, laid across the bed at right angles.

Although I haven't done this, you may want to weld some sort of "retainers" on the jack-support plate (see "jack sits here" on sketch) to be absolutely sure the bottom of the jack can't slide out.

Note that, although the jack seems to hanging from its top in the sketch that is not the case. The jack would actually be sitting on the jack support. I'm just not a good enough artist to draw it all as one unit.

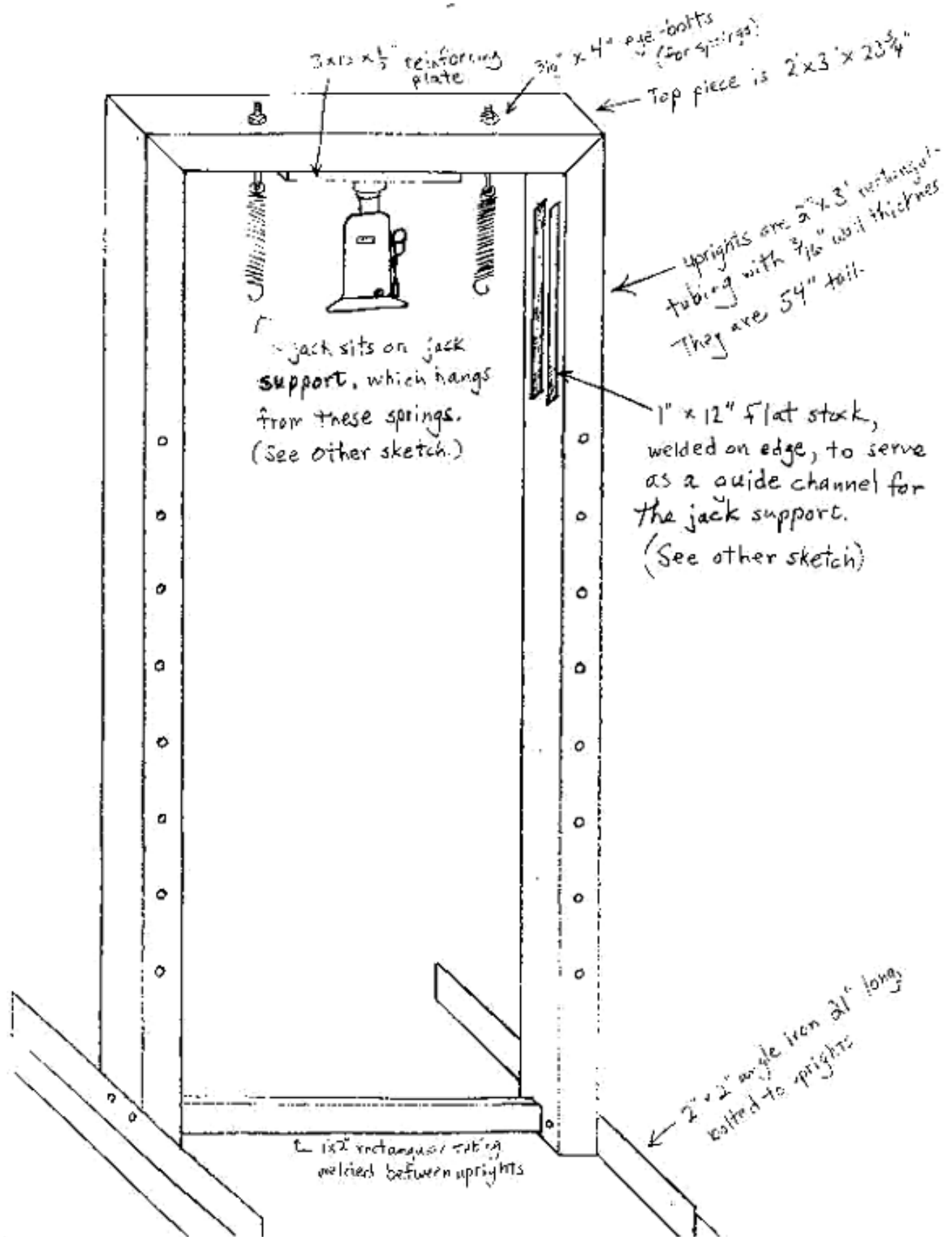
Ideally, when everything is put together, the springs will pull the jack up to a just-barely-closed position when the valve is opened. This is where you can use the eyebolts to do some fine-tuning. Again, spot-weld before final welding, so you can make adjustments as needed.

Now clean up your welds, paint the whole thing bright red and you'll have a nice press at about a third of what a "store-bought" unit would cost. And you'll have had a few hours of fun in the process.

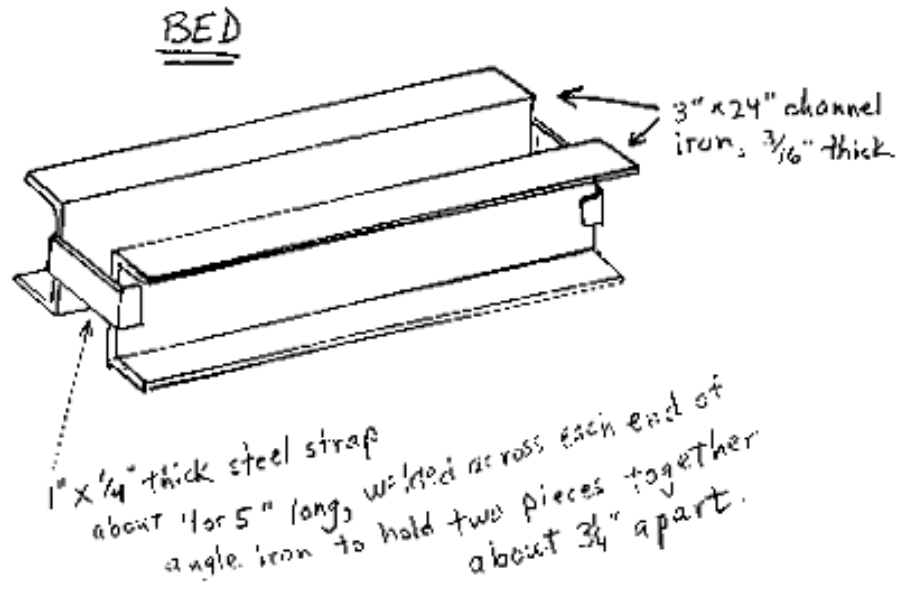
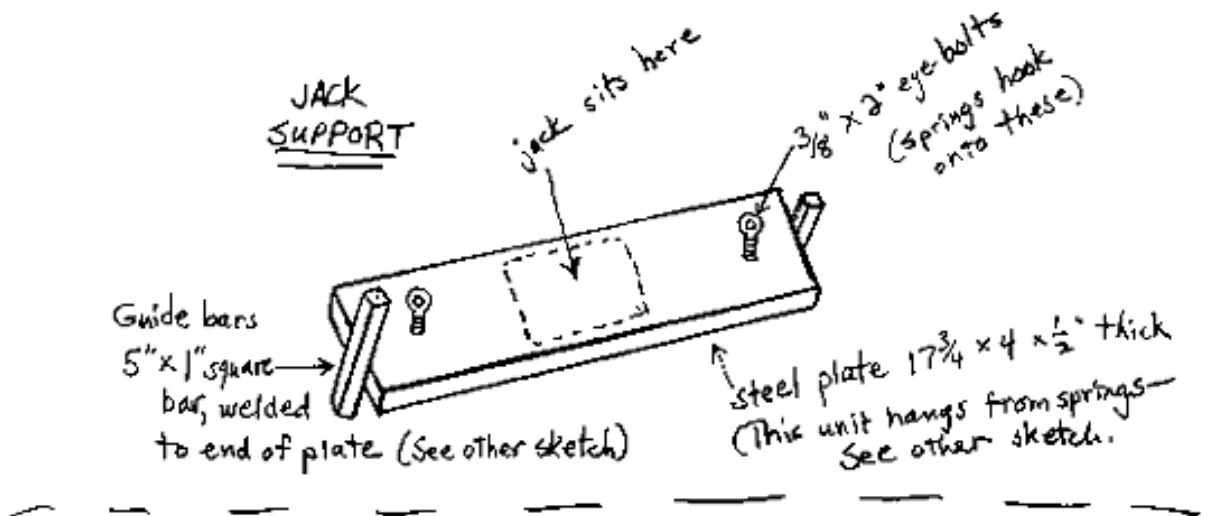
I have used my press to press ball joints and control-arm bushings out and in during a front-end rebuild on an old Nova; to straighten out a badly bent drawbar from a friend's 9N Ford tractor, to straighten a bent trailer axle; to correct a bent front hub; etc. It's not a tool I use every day, certainly, but it would be impossible to do some jobs without it.

Although I understand everything I've drawn and explained here, it doesn't mean I have made everything perfectly clear. If you need clarifications, feel free to e-mail me and I'll get back to you. One final suggestion: If you have access to a store that sells hydraulic presses, go in and look them over. It will help you to understand exactly how they're built before putting your own together. And when the clerk asks if you need help, you can honestly reply, "No - just looking."

# Press Frame



## Jack Support



Good luck with your project.  
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