RON COVELL

Ron Covell is a talented welder and metalworker in the automotive industry. He writes a monthly column for the Goodguys Gazette and contributes technical articles to Modern Rodding and Classic Truck Performance magazines. He owns Covell Creative Metalworking, teaching private classes at his home base in California, and streams 20 instructional videos on metalworking and welding, plus offers over 100 videos free on YouTube.

SKILL LEVEL: Intermediate
TIME COMMITMENT: 10–12 hours

TOOLS AND MATERIALS

- **Millermatic® 142 MIG welder**
- **Shielding gas - C25**
- **Filler Metal - .024 ER70S-6**
- **Casters - Service caster 3"-diameter expanding stem**
- **Sheet metal - 18 ga. cold rolled steel**
- **Cooking pan - 19"-diameter spun aluminum pan**
- **Round over-dies - 5/16" and 1/2" Covell round-over dies from Trick Tools™**
- **Bead roller - Pexto 622**
- **Punch & flare dies - Mittler Bros. 1", 1-½", 2", 2 ½"**
- **Abrasives - 3" 80 & 120 grit, 6-inch 120 & 180 grit**

Materials used but not required: Miller stool

WARNING: READ AND FOLLOW ALL LABELS AND THE OWNER'S MANUAL.

DIY WELDING PROJECT: TOOL STORAGE STOOL

Learn how to create a comfortable but functional stool to help you in the shop.

STEP BY STEP

I do my best work when I'm comfortable, and I'm usually most comfortable when I'm seated. For some time, I've wanted a stool with certain features — something that's low, rolls easily over small obstacles, and has a storage tray. I recently got a new Millermatic® 142 welder, which I'll use for building this project.

My stool will have three legs, so it will be stable on any surface, and I'll use 3" casters, which can easily roll over small obstructions. I found a 19" cooking pan, which was ideal for the tray, and I was ready to start the design.

With a little research, I found casters that mount with an expanding stem that fits inside a 1 ½" tube. I positioned the casters close to the edge of the pan and measured the distance between them. I made a fixture to hold the caster mounting tubes in the proper location and support the 2 ½" tube that will hold the seat. I made the fixture from ¾" plywood, covered with sheet metal to protect it from heat and denting. I used a piece of ¾" pipe as a column to hold the seat tube, and a standard pipe flange holds it vertically on my fixture.

I drilled holes in the fixture at the caster centers and inserted ½" bolts. Tightening these bolts will expand the caster arbors, gripping the mounting tubes and pulling them snugly against the fixture. I made some MDF sleeves that fit inside the seat tube and slip over the vertical pipe. A hose clamp tightened on this pipe allows me to position the seat tube at any height.

With the caster and seat tubes located, I was ready to design the legs that join them.

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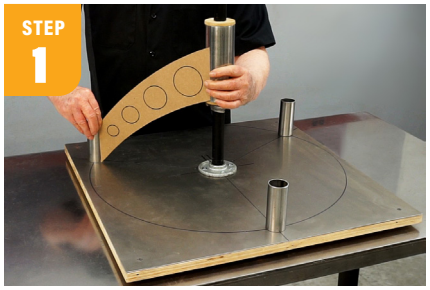
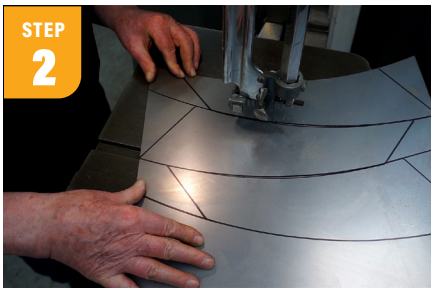


First, I mocked up a simple leg with parallel edges. I considered a tapered leg, and then a curved and tapered leg. I went with the last iteration, and added four holes to give it a high-tech appearance that reminds me of race cars and aircraft.



I transferred the leg pattern onto 18-gauge sheet metal and cut out 6 parts.

Using round-over dies in a bead roller, I curled the top and bottom edge of each part.

Next, I used punch and flare dies to make the holes in each part and radius the edges.

To finish the legs, I cut tapered strips of metal to cap the top and bottom edges, and I used the round-over dies to curl the edges on each cap. I used the Auto-Set™ feature on the welder, dialing in .024" wire and 18-gauge steel. I was really impressed with the bright digital display, which eliminates any guesswork with the settings, and the machine worked perfectly for this application.

I placed tacks ½" apart on all the joints.

After double-checking the legs with the fixture, I was ready to finish welding the joints, using the same settings on the welder.

After the legs were welded, I smoothed the joints with a 3" 80-grit hard disc, followed by a 6" 120-grit padded disc.

The final finish was achieved with a 180-grit sanding disc on an orbital sander.

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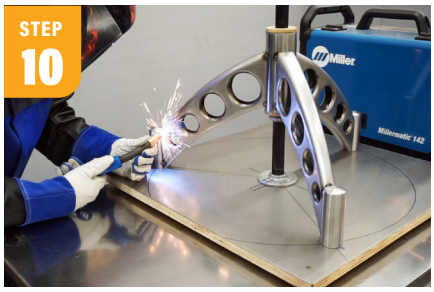
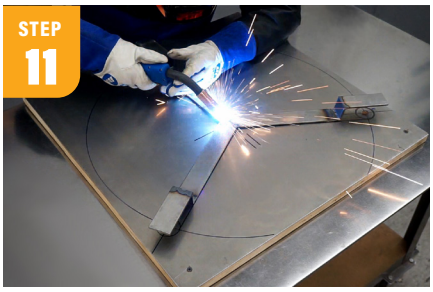
STEP 10



The fixture did a great job of holding the caster and seat tubes in position while I scalloped the ends of each leg to fit, and I tack welded them into place. The seat and caster tubes are 16-gauge and the legs are 18-gauge, so I readjusted the Auto-Set parameters for the thicker metal and used some strategy to join the different thickness materials. I aimed the wire more directly at the thicker metal, which absorbed the bulk of the heat, but I allowed the puddle to lightly flow into the thinner metal, ensuring a good bond on both sides of the joint.

STEP 11



After welding, I ground all the joints smooth. I used a small belt sander to create a consistent radius on the fillet welds, followed by sanding with a 120-grit disc, and orbital sanding with 180-grit.

I needed a bracket to hold the tray to the caster tubes. I made this from ⅛" x 1 ½" bar. I welded three pieces of material together for each of the Z-shaped pieces. I stayed with the .024" filler wire and dialed in the ⅛" material using the Auto-Set feature. Once again, the recommended settings worked perfectly.

Next, I used the fixture to properly align each piece, then cut and welded them at the center, and ground the joints smooth.

STEP 12

The last component to fit was the mount for the seat cushion. I had a spare cushion from a tall Miller stool, and I used it for this project. Alternatively, you could use a wooden disc instead of a padded seat. I cut an 8" square from ⅛" steel sheet, and drilled holes for the mounting screws in each corner. To center this plate on the seat tube, I cut an aluminum disc sized to fit snugly inside the seat tube and screwed it to the center of the steel plate.

Finally, it was time to weld the plate to the seat tube. Again, I was welding materials of different thicknesses — the ⅛" seat plate to the 1/16" wall tube. I kept the same settings I used for the ⅛" tray bracket, and like before, I "favored" the thicker metal with the arc.

STEP 13

With the fabrication complete, I used spray paint to coat all the bare metal parts.

STEP 14

Once the paint dried, I assembled all the components. As a finishing touch, I cut a protective disc of thin rubber for the bottom of the tray.

This was a fun project, and it works extremely well. It's so convenient to have a low stool I can zip around to any part of my working space and a place to store the tools and components I need for the task at hand. I hope you will be inspired to make a stool like this for your own use!