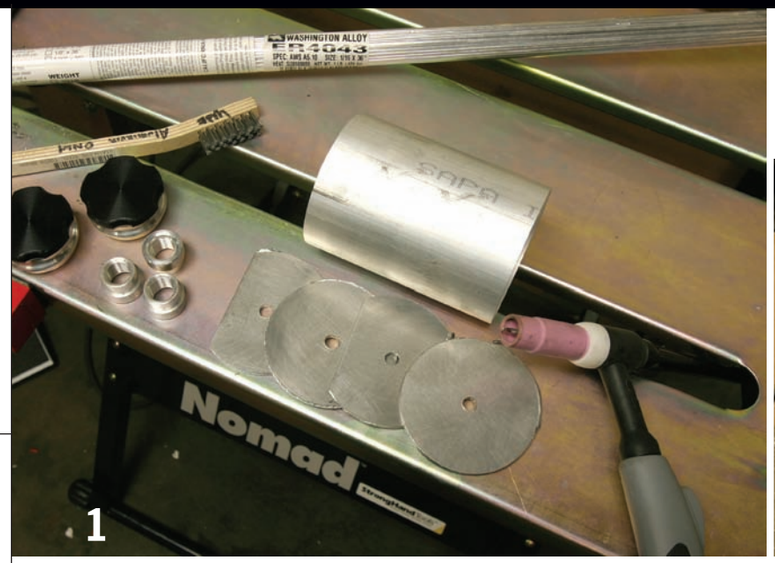
STEP BY STEP

BUILD A CATCH CAN

By John McGann / Photos: John McGann

With a little ingenuity and the right tools, you can make just about anything you need. This month we burned up some aluminum in an effort to make a homemade catch can. More specifically, we will use this as an air/oil separator for one of our cars' PCV systems, and we did it with scrap aluminum from our local metal-supply warehouse.



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1. Here are some of the tools and supplies you'll need for a job like this. We grabbed some remnant 3-inch tubing and sheet aluminum from the remnant bins at M&K Metals in Gardena, California. Left over from previously cut sections, scrap aluminum is available by the pound at discounted prices. This is 6061-T6 aluminum, which is overkill for this application—we could just as easily have used 3003, but the 6061 is what was available in the size and shape we needed.

2. To cut the tubing into usable sections, we had to switch the blade in our chop saw to one meant to cut nonferrous metal. Aluminum can't be cut with the typical organic-material cutoff wheel. The aluminum clogs the blade. Instead, you need a toothed saw like this Rigid bimetal saw blade we bought at Home Depot. We cut the tubing in bite-sized sections—about 4 inches long.

3. To make the top and bottom of our can, we used a 3-inch hole saw to cut sections from the sheet of 6061 we bought with the tubing. We drilled out whole circle sections for the top and bottom of the can. The semicircular pieces we cut on the edges will be used as baffles inside the can. Though aluminum is easier to cut than steel, we sprayed the blade with some penetrating oil to keep the saw from overheating.

4. Next, we used a stepped drill bit we bought at Harbor Freight to make a hole for the AN fittings we will use to plumb the can into our PCV system.

5. Since we're using 1/8-inch tubing, we set our welder at about 100 amps. Miller's Diversion 180 TIG welder was designed for the hobbyist. It runs on either 110 or 220 volts and is priced at around $1,500— very affordable for a TIG machine. If that's not in your budget right now, you could use a MIG welder with an aluminum spool gun, or even an oxyacetylene torch.

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6. If you are using a TIG welder, be sure to use the correct tungsten. A pure or thoriated tungsten electrode works best welding with AC current. Electrodes are identified by colored bands: green for pure tungsten, red for 2 percent thorium, and orange for 2 percent cerium, which is better suited to DC welding. We used a pure (green) electrode.

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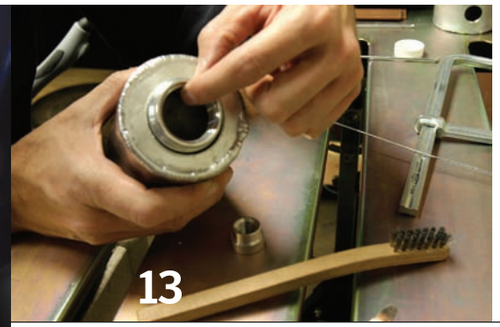
7. Though some people recommend manually forming a ball on the end of the electrode before welding aluminum, we ground ours to a point. A ball naturally forms on the electrode as you use it, as seen on the tungsten in our torch.

8. No matter what alloy you're using, there is a tough but transparent oxide layer covering the entire piece. Think of it as surface rust you can see through. Complicating matters is that this oxide layer melts at a higher temperature than the base metal. Use a brush with stainless steel bristles to break up the oxide layer, and clean the whole piece with rubbing alcohol. Do this right before you begin to weld because the oxide layer re-forms quickly.

9. We began by welding the baffles in place. To hold the baffle at the correct height inside the tube, we propped it up on a seal driver. Our work surface is the Nomad welding table from Strong Hand tools. We attached the ground clamp to the table's steel top, eliminating the need to have to attach it directly to the piece we were working on.

10. You can also bend up a section of filler wire to hold the piece in place

11. With the argon tank set to flow at about 20 cfm, we tack-welded the baffles into place. You don't need to go overboard, either. We tacked ours in four places. Have a set of pliers handy, too. Aluminum transfers heat more easily than steel does, so the whole piece will get very hot very quickly.



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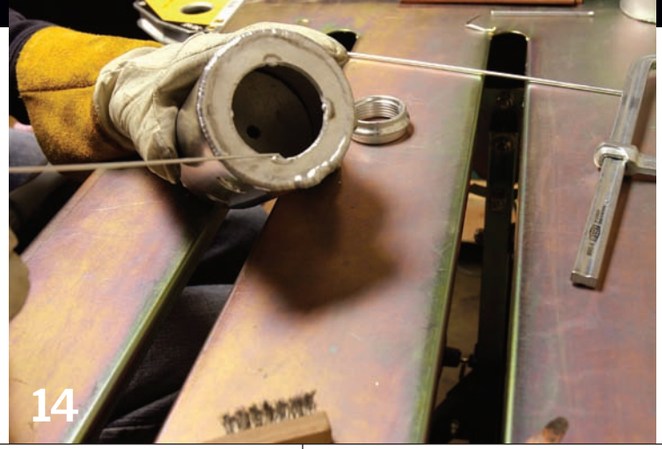

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12.With the baffles and lid welded in place, we used a 2½ -inch hole saw to cut the opening for the threaded inspection cover.

13. The drill wobbled a little and we ended up with a bigger opening than we wanted. The weld-in threaded collar just fell right through the hole.

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17. We used 1/16-inch filler wire on the fittings rather than the larger 1/8-inch stuff we used on the lids.

18. Nearly done, the inspection cover and PCV line fittings are in place. We just need to weld in the fitting for a drain plug for the hole on the bottom. **END**

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14. To get it to stay in place while we welded it in, we put several small tacks around the edge of the opening, essentially creating a shelf to drop the collar on.

15. This allowed us to tack weld the threaded collar in and then weld it up.

16. Last, we welded the fittings in place that we will eventually plumb into one of our car's PCV systems. Keen eyes will notice the holes are in a different location than in the previous pictures. This is the second can we made. The first was pretty ugly.

→SOURCES

Airgas West; Gardena, CA; 310/523-9355; Airgas.com
Harbor Freight Tools; 800/444-3353; HarborFreight.com
The Home Depot; 800/466-3337; HomeDepot.com
M&K Metals; Gardena, CA; 310/327-9011; MKMetal.net
Miller Electric; Appleton, WI; 920/734-9821; MillerWelds.com
Strong Hand Tools; Pico Rivera, CA; 562/949-8625; StrongHandTools.com