



automotive

LET AUTOMOTIVE.COM
SAVE YOU HUNDREDS
ON CAR INSURANCE



SUBSCRIBE HERE!

ROD &
Custom



17 SUBSCRIBE TODAY



Reader's Rides

Sign up & Show off your ride

Search

FEATURED CARS · TECH · EVENTS · NEWS · HISTORY · WALLPAPER · VIDEOS · ROD SHOP · COMMUNITY · SUBSCRIBE

Home » Tech Articles » Metal Tube Bending - Bending Made Easy



Let
automotive.com
save you
hundreds of
dollars on
CAR INSURANCE

CLICK HERE
TO GET
COMPETITIVE
QUOTES

Official Merchandise
**ROD &
Custom**
Apparel, Gifts & More
CHECK IT OUT!

Create Your Own
**ROD &
Custom**
Custom Cover!
CLICK HERE



Metal Tube Bending - Bending Made Easy Getting Your Head Around Tube Bending

By Kev Elliott

You may not think you'd have much use for a tube bender when building a car if you're not contemplating fitting a rollcage, but they have plenty of other uses. They come into play while fabricating chassis crossmembers or under cowl braces, whether for adding strength to the cowl or for mounting brake boosters, A/C units, or even pedals. But think smaller, too. How about nerf bars, bumpers, tube grilles, even? Or perhaps for framing out a body, whether 'glass or steel. See, you can bend square tubing as well as round tube, which opens up numerous possibilities. In fact, as is so often the case, once you have a tool, in this case a tube bender, you'll wonder just how you managed without it!



Let's look first at bending square tubing. This is easily achievable with a very basic bender, such as a floor-mounted item readily available from discount tool warehouses. The trick to bending square tube is to be able to "push" the side of the tube on the inside of the bend inward as the bend is formed. Think of the bends on school chair legs, and the like.

We noticed this at Aldana Race Cars and Components in Orange, California, where the crew was using this method to great effect on the inner framework of a glass '27 T they had in the shop when we visited. By bending the tubing, it could follow the contours of the body and doorskins, providing a lightweight yet sturdy framework in thin wall 1-inch square tubing. OK, so it isn't as attractive as round tube, but it does what it's intended to do with minimal fabrication once hidden behind upholstery.

Moving on to bending round tubing, Nate at Aldana tackled a single bend in 1-1/4-inch-diameter, 1/8-inch wall round tube, destined to become a rear radius rod. For this, he used an MB die in a Cranlee hydraulic bender. However, a neat trick we'll share with you is a way to save money by not having to buy dies to fit every diameter of tubing. The die used is for 1-1/2-inch tube, but Aldana has fabricated a number of "cheater" dies, which consist of 1/8-inch wall, 1-1/2-inch-diameter tubing first bent in the 1-1/2-inch die, then cut in half so it fits inside the die. This reduces the tube diameter that can be bent to the same as the inside diameter of the cheater die, in this case 1 1/4 inches. Of course, a corresponding 1-1/4 1/4-inch "shoe" or follower has to be fabricated or bought, too. This is the straight former that "follows" the tubing as it is bent.



Next, Nate fabricated the main section of a tubular rear bumper for a '32 coupe. This was formed from 1-1/2-inch-diameter seamed tubing, so no need for the cheater die. Aldana likes to place the seam on the inside of the bend to avoid it splitting during the bending process.

We also paid a visit to Kiwi Steve's Hot Rod Shop in Brea, California, for a lesson in bending rollcage tubing and how to notch the ends where two tubes join. Steve is an SCTA tech inspector and is currently putting together a '27 T Bonneville car. He starts any bending job by determining a consistent known point where a bend will begin to form on a piece of tube, much like the way Aldana marks the tubing. In the case of a rollcage, rollbar, or cowl brace, he'll make a mock-up from cardboard to determine the physical limitations inside the vehicle. Then, he'll use this to draw a fullsize template, usually on the floor by the bender, as that's a nice large flat area to work on! We won't get into the specific diameters and gauges of tubing required for rollcages or rollbars, as they vary depending on the motorsport involved, but would advise you to consult your rule book for such specifications before cutting and bending any tubing.



Aldana Race Cars



The operation is very



Here's the finished

You could **SAVE HUNDREDS**
on **Car Insurance**



Related Hot Rod Articles

Drag Racing Origins - The Guys Who Invented Drag Racing

Origins of drag racing could be traced back to lakes racers, and Leslie shares his involvement in... [more](#)

Rod Custom Fan Letters And Questions - Rappin'

I started reading the little pages of R&C when I was in my early teens. It's always been a great... [more](#)

1929 Ford Tonneau Cover - The Cover-Up

Tooling along taking in the bouquet of the landscape, the wind coursing through your hair, nothing... [more](#)

1927 Ford Roadster Pickup - Surfer Bird

Lynn Bird began a project and ended with a Ala Kart inspired 1927 Ford Model T roadster show car.... [more](#)

uses this die in an inexpensive floor-mounted, manually operated bender to form 1-inch square tubing. The trick to enabling the inside wall to collapse inward is the piece of round rod in the groove of the die.



Installed in the '27 T, the square tubing makes a strong and lightweight inner framework.

simple. Previously marked where the bend is to start, the square tubing is fed into the bender, clamped tight with the mark at the point where the radius will start to form, and the handle pulled until the desired bend radius is achieved.



Here's a 1-5/8-inch MB die for illustration purposes, with a 1-3/8-inch cheater die and corresponding shoe.

bend with the tubing ready to be cut to length.



This shot clearly shows the 1-1/4-inch cheater die inside the 1-1/2-inch MB die and its corresponding cheater die in the shoe on the right. The tube is clamped and ready to be bent.



With the cheater die inside the MB die, and the tubing clamped in the hydraulic bender, Nate actuated the bender, gently forming the bend in the tube.



Things can go wrong really quickly here, but using the gauge on the bender ensures the bend can be repeated to exactly the same angle, useful since the second radius rod needs to have the same angle bend as the first.



Here's the formed bend, as well as a previously fabricated and completed radius rod. Aldana can supply complete radius rods or the components for you to fabricate your own.



Using a template traced from the rear of a '32 coupe and drawn on card, the angle of the bend at the end of the bumper, where it will wrap around the corner of the body, is determined and then formed in the same way as the radius rod tubing. The mark on the tube is where the radius will start to form and is placed in the hydraulic bender exactly at the edge of the die.



The bumper obviously requires a bend at each end, which is where things get a little more complicated, as each bend has to be the same angle (easy, thanks to the gauge on the bender, though Nate also checked it with this angle-finder), equidistant from the centerline of the bumper, and in the same plane.



The template is used to mark the centerline then from there, the position where the radius will start to form can be marked on the tube.



... then from there, the position where the radius will start to form can be marked on the tube.



With a little practice, you'll be forming pieces like this trans crossmember, which features four bends. The trick is to start from the center and work your way out. Oh, and to remember which way the bend has to go. There's nothing worse than getting to the last bend and realizing you've bent it the wrong way!

Using a digital gauge, the tube is leveled, as is the already angled end, ensuring the second bend will be at the same angle.



The tape on this pattern shows the point where the bend will start, and is positioned at the edge of the die in the bender. This is a JD2 manual bender, one of the most popular in use.

With the ends cut to length, Nate checked the fit by holding the bumper against the rear of the '32. All it needs now are a couple of brackets to bolt it to the body.



The reason behind making a short section as a pattern is because it enables you to transfer the bend start marks to the template on the floor, and then to the actual workpiece. The fact that it is bent more than 90 degrees is irrelevant; what's needed is the bend that can be laid over the template to transfer the marks



Here's the pattern held against a finished rollbar, showing how accurately the marks on the pattern transfer to the workpiece. Here's a useful tip: Steve always marks the tube (usually writing "bend" on it) on the side of the mark that the bend needs to be formed on. This works as a fail-safe, as it's easy to turn an almost-finished piece of tube into scrap by bending the wrong side of the marks. And, of course, it'll always be the last bend that gets messed up, never the first!



This is the top of the rollcage in Steve's personal lakes racer. We're showing this to illustrate the notching required where two tubes meet. A good fit is essential for strength and minimal welding. These will all be TIG welded in time.



We showed you this neat Pipemaster tool in our "Rod Shop" section last month, and it's invaluable when determining the angle at which to notch tubing.



Here's how to make perfect notches: with a dedicated tube-



Speedway Motors sells this tubing notcher, ideal for the homebuilder.



Another tip is to use a drum or barrel sander to clean the notch after cutting, as well as to remove any excess metal from inside the tube, since you'll never

notcher mounted in a pillar drill. Different-sized hole saws are used to notch varying diameters of tubing.



Speedway Motors also sells this 8-ton tube bender, with various dies from 1 to 1 3/4 inches.

remove the rattling swarf inside the tubes once it's welded together!

Aldana Race Cars And Components

Pipemaster

JD Squared

Speedway Motors
(800) 979-0122

www.speedwaymotors.com

Kiwi Steve's Hot Rod Shop
www.kiwisteves.com

[Discuss in Our Forums](#)
[Share This](#)

Chrysler Crossfire Research



Explore the world with a new [Chrysler Crossfire](#). The **2008 Crossfire** goes for a suggested retail price of \$34,735.00, and comes with a standard Manual transmission, and RWD drivetrain. Other similar vehicles are the [Chevrolet Suburban](#) and the [Cadillac XLR](#).

Sponsored Links



[Home](#) | [Featured Hot Rods](#) | [Technical Articles](#) | [Events & News](#) | [Historical Articles](#) | [Hot Rod Wallpaper](#)
[Hot Rod Videos](#) | [Rod Shop](#) | [Contact Us](#) | [XML](#) | [Subscribe](#) | [Subscriber Services](#) | [Give a Gift](#)
[Licensing](#) | [Reprints](#) | [Store](#) | [Site Map](#) | [This Month](#) | [Terms of Use](#) | [Privacy Policy](#)

SOURCE
INTERLINK
MEDIA
AUTOMOTIVE DIGITAL

© 2009 Rod & Custom,
Source Interlink Media
All rights reserved. WEB-040