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Bendin' Tube 101
By Rob Park

I'm sure for some, when you first unpack your bender, you'll be lost. I don't blame you, it looks like some sort of medieval torture devise...

It'll have some very confusing instructions and list of calculations that might as well be written in some ancient language. So you'll throw some tube in the thing, pull the handle, and Ohhhh YEahhhh, you've bent tube with your bare hands! (In my best Tim Allen voice... aruh... aruhh... arhhh)

But now you've got a bent piece of tube, with no way to know where to start, or stop. I'd like to share some simple things I've learned, after what seems like miles of wasted tube.

Yes, there is another way to do it!

You don't need some big computer program, a degree in math or even have to know more than just basic addition and subtraction. True, this is VERY BASIC, but with this, you can bend like a pro (almost)....lol

Here are some basic tools you should have.... A clean floor, level, measuring tape, permanent pen, adjustable square, protractor, framing square and my favorite home made tool that I like to call my "angle-o-meter". lol



A good stand is very important too. Try to get it level by measuring off the die.

Again, this is by no means the only way, but in my opinion the EASIEST way to START. First step is to forget everything that you've heard or read about "centerline radius", bend center, blah blah blahhh...

Now throw a piece of tube in your bender and crank on the handle (get use to it, cause that handle is going to have to be pulled THOUSANDS of times to make your money back) and bend a 90. You can use your framing square as a guide by laying it on top of the tube while it's still in the bender to make sure what you end up with is a 90.

Once you get that bent, take a look at how the tube "looks." You'll see that the inside of the bend has a small distortion where the bend starts, and where it stops. Sometimes, it's just easier to "feel it", by just running your finger around the inside of the bend. This "start and stop" is going to be the Guide that EVERYTHING is based on. Once you have found this point, mark it with a pen.

*** Remember, EVERYTHING from now on will be based on this mark ***



Now that that is out of the way, you have a place that you can measure from. Remember that big list of calculations that came with the bender? The one that somehow is supposed to tell you how to figure out how to measure and figure the bend. Pick up that list and toss it as far away from you as possible.

It's as simple as this.



Lay your 90 inside your square and see how many inches that it takes to complete the bend, start to stop. They both should be the same measurement, in this case it's 5 1/2". See, by doing it this way, you're not worried about what the centerline is or what size tube it is or any of that other "fancy" stuff. You KNOW that it takes 5 1/2" to complete a bend.

Example: Say you want a hoop 60" wide to the out side of the bend... So it's $60" - 11" = 49"$ from the start of bend...

Now keep that piece, because it's now a VERY important tool. If you have more than 1 size die now is a good time to bend them to 90, measure and mark them too.

If you look at your die, you'll see the point where your bend actually starts, (it'll leave a mark, if not, you can use some grease) it should be about an inch or so from the leading edge. Since this is the point where it actually starts the bend, you'll need to mark it on your die. This one is ground in, so you can see it, but a paint pen works too.

As long as it's a bright color and you can see it, who cares.

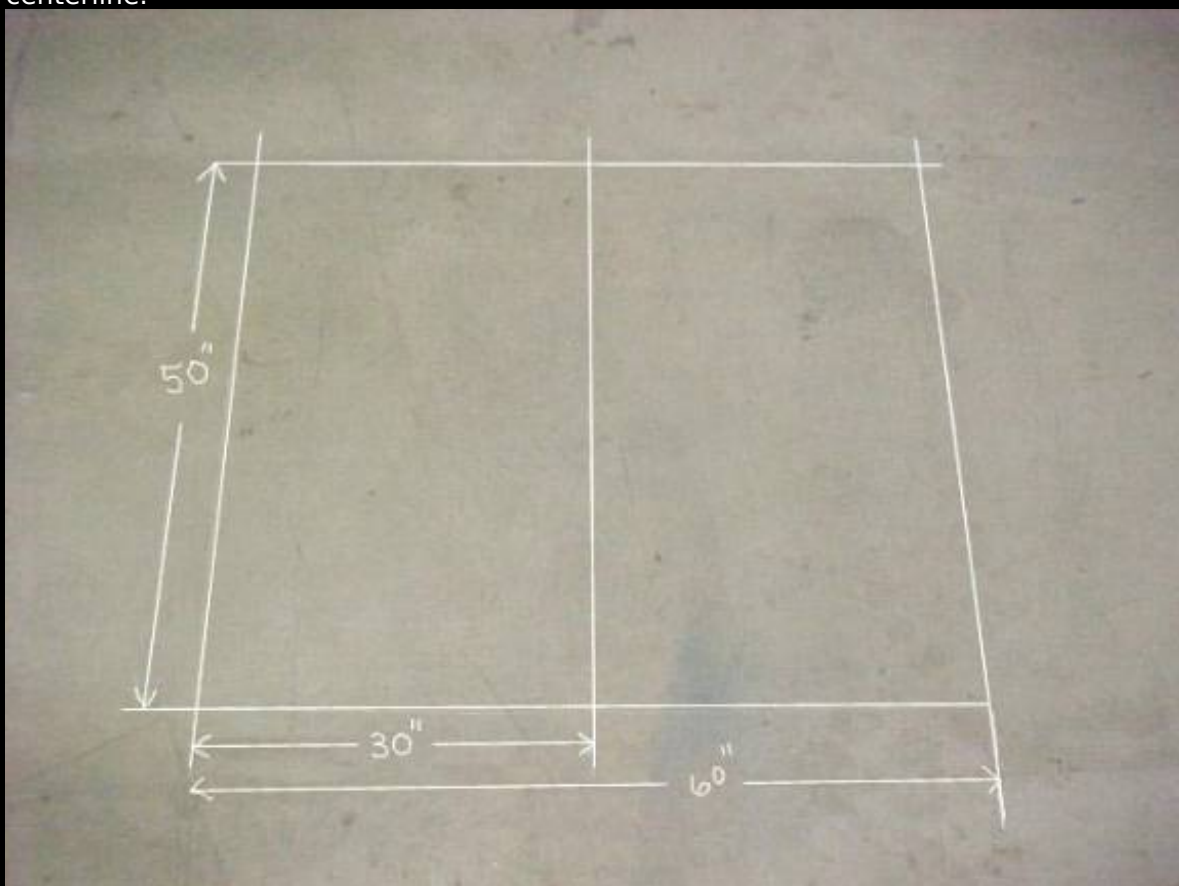


Once you have both your die and tube marked you're all set! You now know where your bend will start, where it will stop, and have the ability to "rebind" exactly where you left off **IF** you come up short a few degrees on a bend.

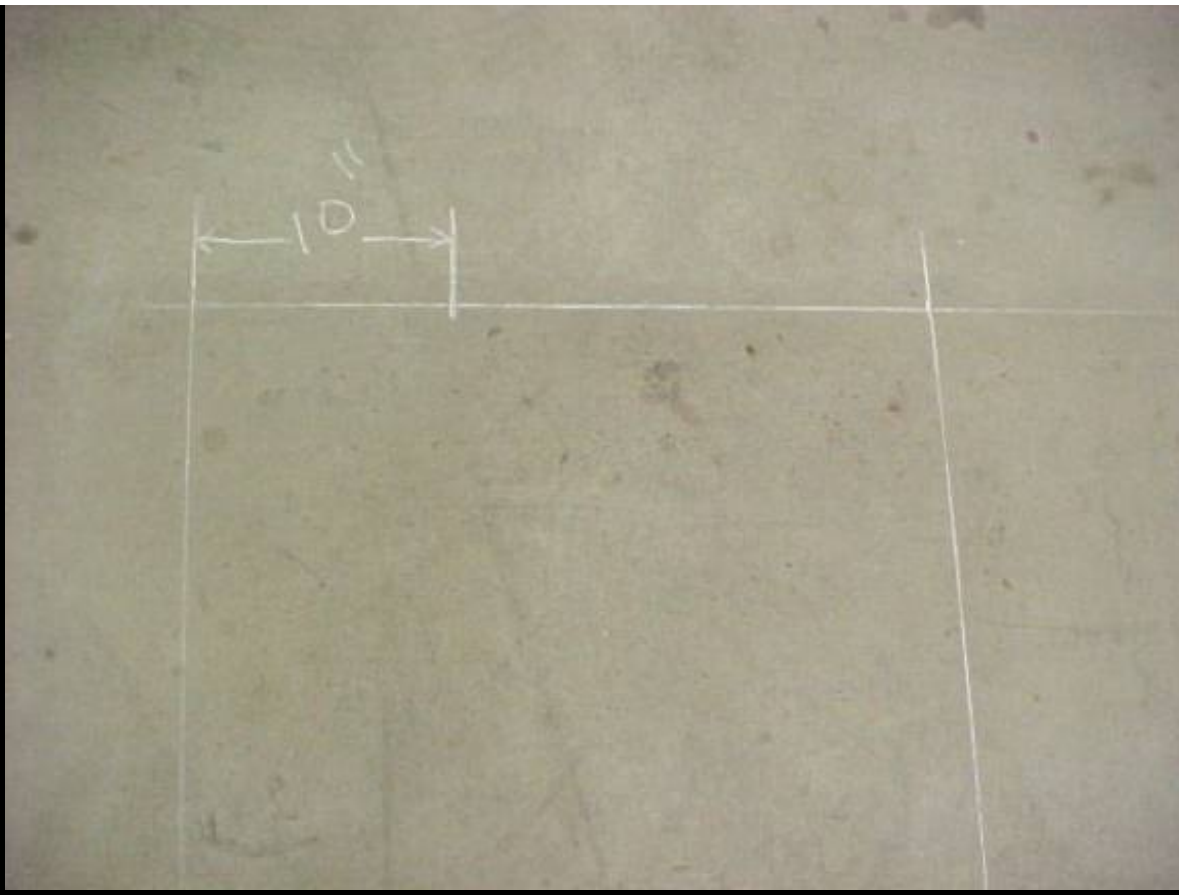


I guess the next step is trying to explain how to lay out what you want.

Lets take for example a simple B-pillar hoop (the one from side to side over your head). First, you need to find out just how wide, and tall you want it. This is where the "clean floor" comes in (from now on this will be your "layout table"). Draw a perfect square right on the floor with chalk the size of your highest and widest measurement. Next, draw yourself a centerline.



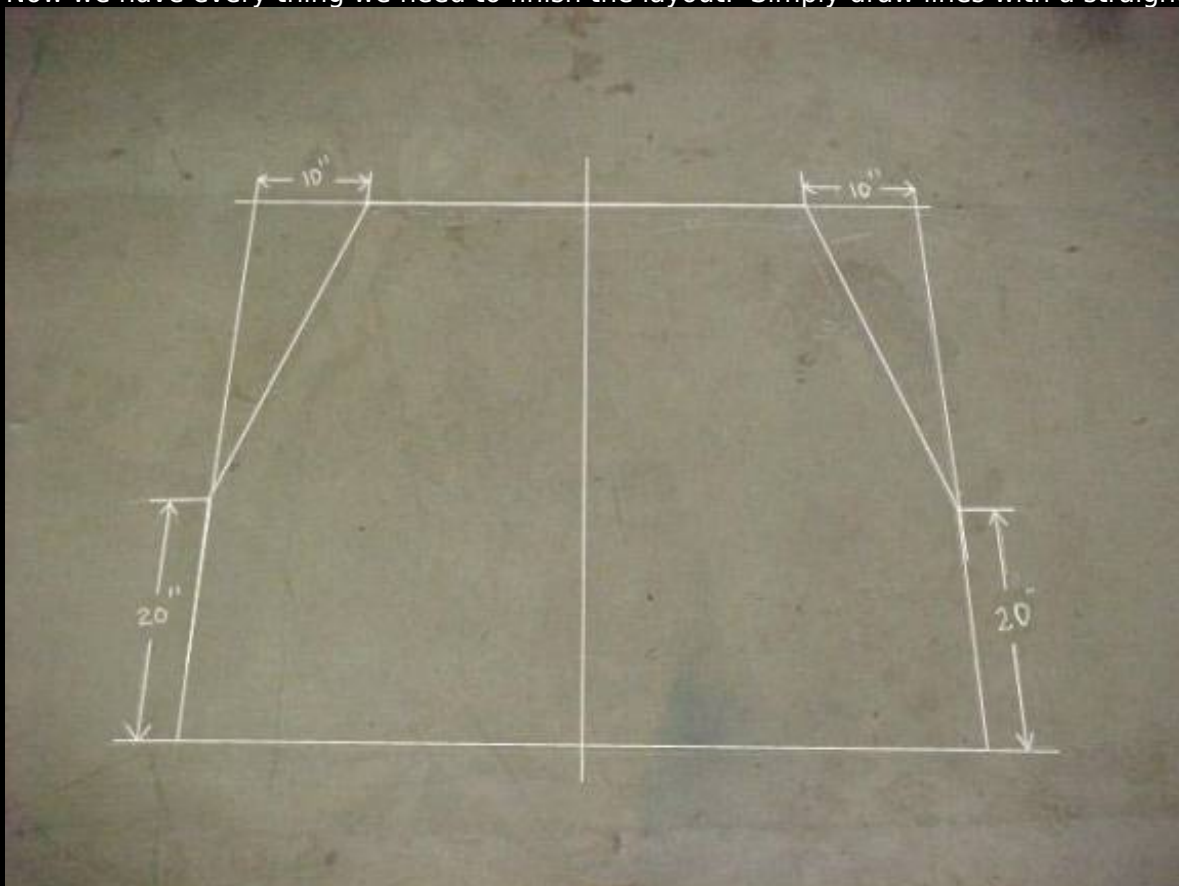
Let's just say the very top of your hoop needs to be 20" narrower than the sides, so measure in 10" from both top corners, and mark.



Now let's say that your door height or bed rail sits at 20". So measure up from the bottom, and mark at 20".



Now we have every thing we need to finish the layout. Simply draw lines with a straight edge connecting the points to get your outline.



Pretty fool proof so far?

Here is where that 90 you bent and marked comes in. Start from the center and work your way out and down. You simply lay your 90 on the floor parallel to your top chalk line, and slide

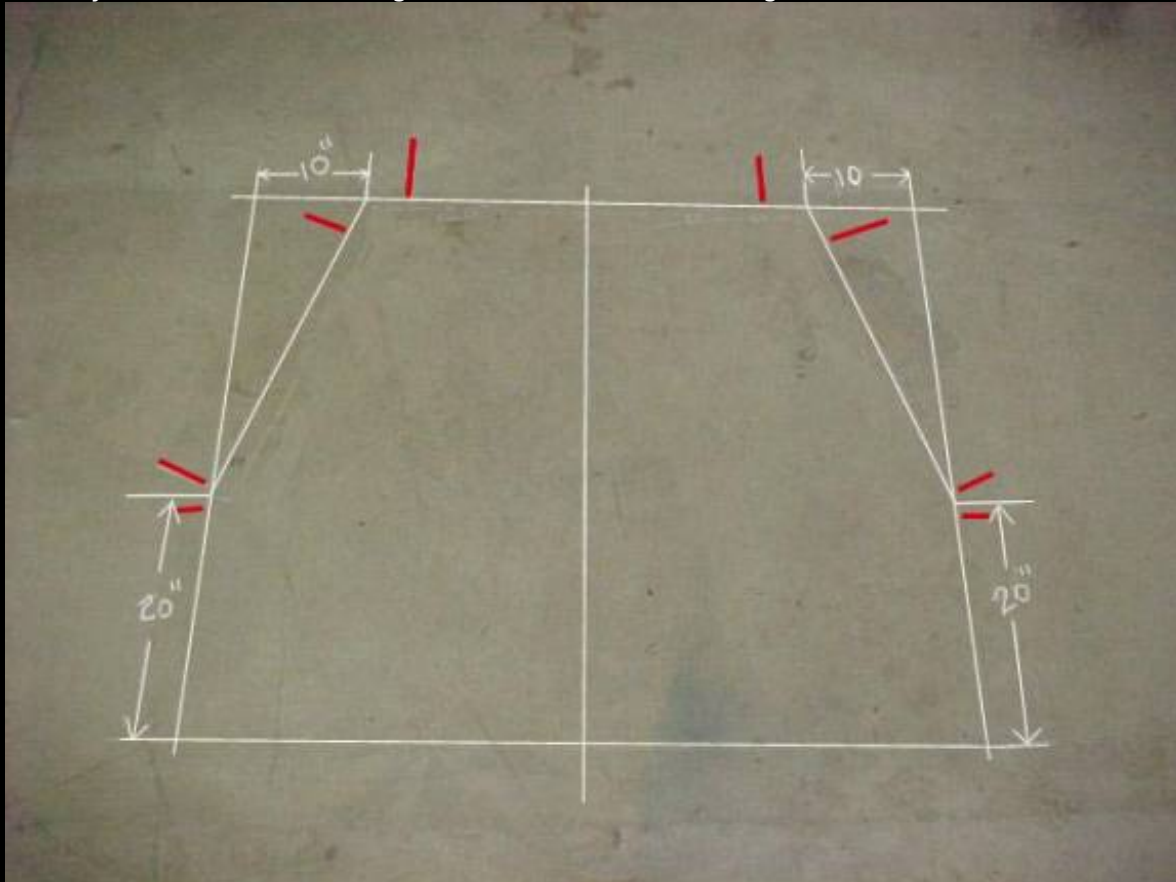


it over till it intersects your down line, and mark the floor.

Now do the same thing to your uprights.



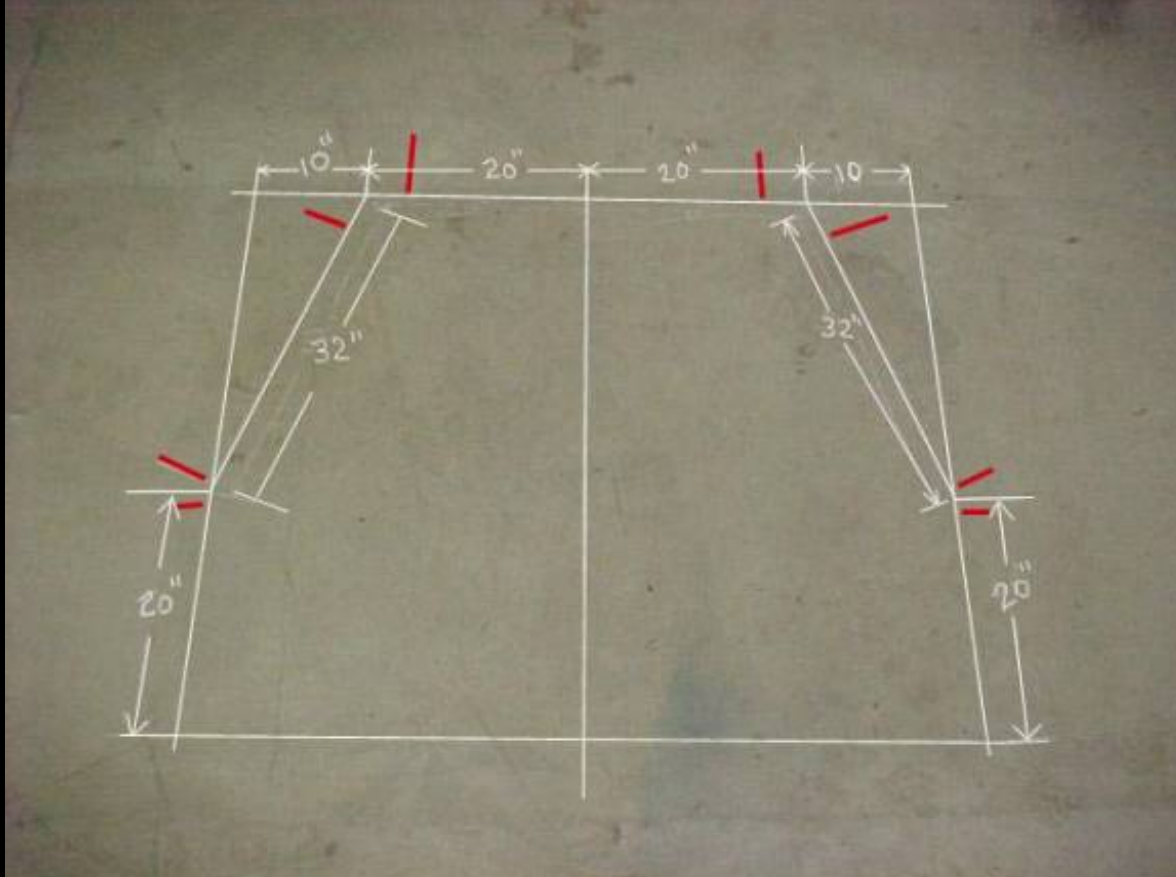
When you're all done marking it, it should look something like this....



Now lets get an idea of just how much tube it's gonna take... Remember if you make it too long, it can always be cut down, BUT if it's too short, you're screwed. "LONGER is BETTER" ... And after you get the hang of it, you'll keep the waste down. Let's add up the measurements.

$$20'' + 32'' + 20'' + 20'' + 32'' + 20'' = 144''.$$

Now you can cut your tube, and just to be safe, give yourself a couple X-tra inches. Let's just call it 148" total.



***Work from the center out...**

Once your tube is cut to length, mark the center, which ends up at 74".

Next, simply line up your Tube on your layout , and mark where your first bend marks are, make sure to show the direction of your bend by marking an arrow on the tube. (Trust me, no matter how good you are you're going to end up bending from the wrong side of the line sometimes, if you don't) Remember... "from the center out" make both bends on "top" first, then the bends on the "uprights".



Chalk up your tube in the bender by lining up the marks and the direction arrow (seam to the inside).

Here is where the "angle-o-meter" comes in. Use it by finding your bend angle from your layout, then bend to the same angle by looking down it and comparing it to your bend.



When you think you've got it, check it against your layout to make sure your "top" bend is still on track.



Once that bend is complete, swap ends around and bend from the other mark, making sure your first bend is level. (2 man job)



Now mark your next bends (the uprights) against your layout and bend them the same way. When you're done with your bends every mark should line up like this.



All that is left is to mark and cut it to the right height...
 You can use the same technique to do door bars front hoops on and on and on....
 I know this is only single plain bends and very simple, but it should help you to get STARTED.

*** Here are few words of warning ***

- I wouldn't suggest going in with someone to buy a Bender if you can help it... It WILL cause lots of problems and tension between friends.
- You are taking your life into your hands by building a cage... Make sure you think LONG and HARD about that.
- Take your time; build very simple stuff like bumpers, sliderz and such before ever attempting to build something that is meant to save your life.
- **IT'S NOT CHEAP**. You'll have to spend over 1k just for the bender and a couple dies, and that doesn't include the welder, notcher, chop saw, grinders and all the countless other little nickel and dime stuff that it'll take.

Rob Park
 A.K.A. "Tin Bender"

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