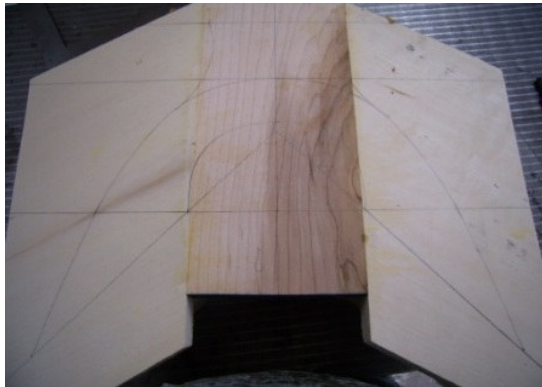


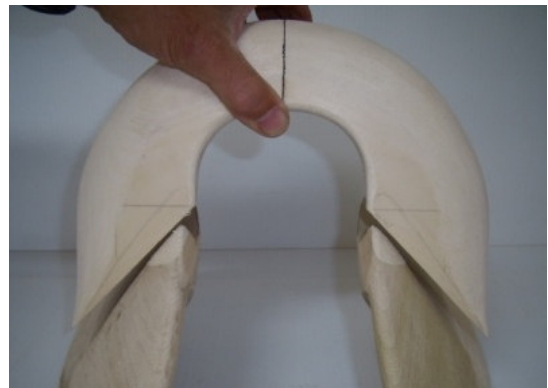
## Bar Angles – Why the Numbers Are Meaningless Between Makers

Trying to compare fit of trees between tree makers seems to be a favorite pastime of saddle makers. You can measure width between the bars at the hand hole, but how do you measure the angle at which the tree maker set the bars? A very common question. The answer is – you can't. And even if you could, it wouldn't make any difference, because there are other factors that affect how quickly the bottom of the bars get farther apart than just the angle marked on the fork.



Most hand made tree makers set their bar angle on the back of the fork when they mark it out.

The first reason attempting to measure this angle is futile is because this section disappears into the fork cuts

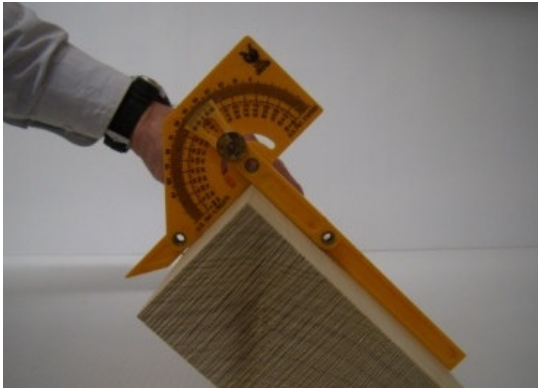


and is inaccessible once the tree is together even before it has been rawhided.

Next, the bottom of the fork is cut out at an angle, getting wider towards the front. This angle not only varies between makers, but is changed depending on how stood up or leaned ahead the fork will be.

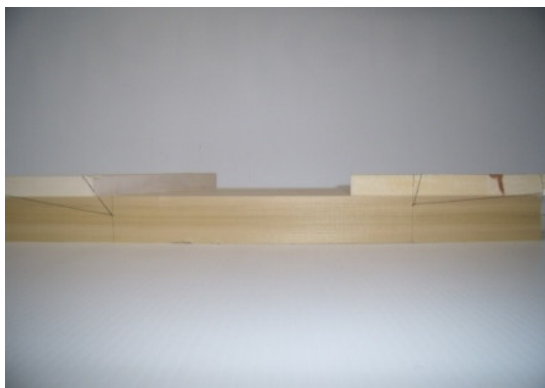


Why is that important? Because when you introduce that third angle, 90 degrees is no longer 90 degrees. As you can see in the picture, the protractor, when placed on a 90 degree corner, matches the corner. But when you add in that pesky third dimension by tilting the protractor, you can see the space developing between the ends of the square and the wood. The further it is leaned, the greater the space.



This means that when a fork is tilted, it effectively changes the angle, and the more a fork is leaned ahead, the wider the resultant angle actually gets. A tree marked out at 90 degrees leaned ahead will measure wider across the bottom for the same bar type and hand hold width than the same fork stood up. This is one of the reasons why what is marked on the back of the fork is not what is measured across the tops of the bars. We compensate for this so all our “90 degree” trees fit the same (90 degree equivalent) whether they are leaned ahead or stood up. We do it by changing the angle we mark on the back. Other makers may change it the same way, use different methods to achieve the same end, or don’t compensate at all. So, even if you could measure what we mark on the fork, what the actual measurement is may not be what we call the corresponding fit.

The bars themselves are cut out in three dimensions as well. The fork cuts are crucial to not only set the front of the bars but they work in conjunction with the fork angles to determine how far apart the back of the bars end up, which also affects the angles there.



Back and front bar cuts marked out



Front bar cut seen from the inside of the bar

## Rod Nikkel Saddle Trees



Front bar cut seen from the front

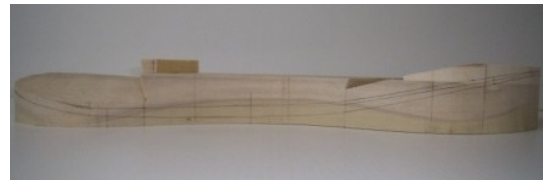


Back bar cut seen from the back

But those angles and numbers only apply to how the bars and the fork connect. What is really crucial is how the bars, particular the bottom of the bars, are shaped. The markings for shaping the bottom and the seat of the bar are marked along the edge of the bars. These markings vary in distance from each other as you go along the length of the bar and are angled differently across the bar compared to each other as well.



Inside edge

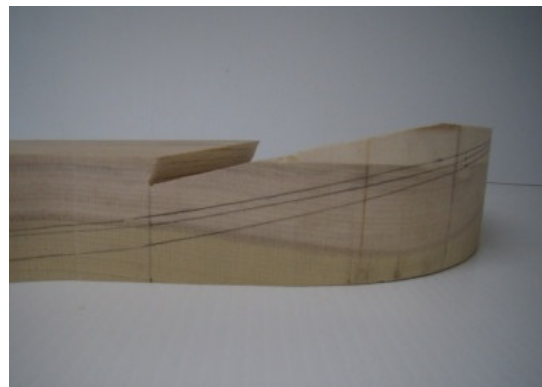


Outside edge



For example, the inside of the front bar pad comes to a sharp edge, merging smoothly with the fork. On the outside, the top of the bar is rasped off, angling down from the fork cut.

The center section of the bar and the back of the bar are shaped down to the markings as well. This is what sets the twist and can also be used to influence the rock. And every tree maker marks his bars out a bit differently.



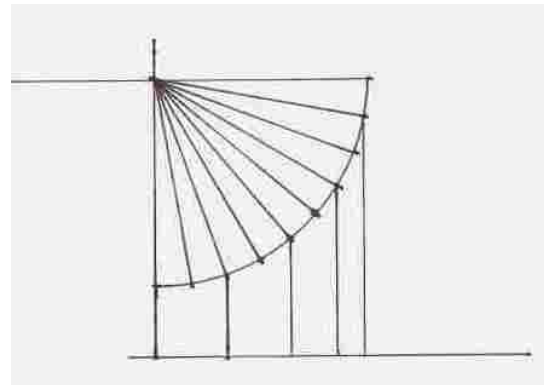


That takes care of the edges of the bars, but what about the middle? It is rounded, but not evenly like half a sphere or half an oval. It varies from one edge to other and from one section of the bar to another. We use more than one crown pattern, and, of course, these patterns vary from one tree maker to another.

So trying to measure a finished tree with an angle gauge anywhere to determine the “bar angle” is a futile endeavor. First, there is no place you can physically measure what we mark out. Second, the angle marked on the back of the fork does not make a consistent fit due to other angles in the tree. And third, the marking and shaping of the bars makes it all redundant anyway.

But can you compare the hand hole width with the width across the bottom of the bar to at least compare between makers? Only if the depth (or width) of the bars themselves are the same and, once again, “every tree maker does things differently”.

Another interesting aspect of geometry is that as you progressively increase the angle, every degree increase makes less and less comparative difference to the width across the bottom of the bars. (Thanks go to David A Morris for showing this to us. It seems very obvious once you know it, but somehow we missed this lesson in geometry class.) You can see that for the first 20 degree spread from the vertical, the distance is greater than for the next 20 degree spread. This results in the difference in measurement across the bottom of the bars between 90 and 93 degrees being slightly greater than the difference between 93 and 96 degrees. So for some of these really wide horses, increasing the bar angle to what may seem to be a large amount may not be making as much of a difference as we originally might have thought.



Final word: the numbers themselves are meaningless to determine how a tree will fit. A wider angled tree will fit wider horses than a narrower angled tree *within one maker's trees*, but between makers there is no guarantee the fit is similar at all. The tree makers whose patterns and methods come from the same “genealogy” will have trees that fit in a similar, but not identical, way. With different bar patterns and methods of building trees, the fits will be more different. This is why you have to talk with your tree maker, trust his judgment for the first one or two and then try them on a bunch of horses. That is the only way to learn what their “4 x 90” or “semi-quarter horse” or whatever term they use to describe their fit really means.