Fitting the Horse

When the rider is in contact with the saddle, what he feels is primarily the result of the work of the saddle maker. What the horse feels is primarily the result of the work of the tree maker. The way the bars fit on a horse when the tree is bare is pretty much what the horse will feel when the saddle is finished. So getting the correct fit is the job of the tree maker, based on the information given by the saddle maker and the customer. This information article aims to explain what factors affect the fit for the horse, resulting in better communication between us and the saddle maker, and better service to both our customers and their horses.

Ideally, every inch of bar surface should contact the horse's back at all times with an even pressure. In practice, this is impossible, since we are dealing with a rigid system on a flexible, mobile back. The shape of the horse's back changes as he walks, trots, lopes or gallops, and how he uses his body and muscles in each of these gaits. Even the resting shape of one horse's back will vary depending on his weight, if he is in working shape or 'soft', his age, etc. So when we are trying to fit a horse, we must realize that we are aiming at the best compromise for any situation. This means that we are generally trying to fit a 'type' or 'style' of horse. Does your customer ride narrow thoroughbred types, halter class quarter horse types, horses that are in working shape or horses that are primarily pasture ornaments? If they ride both narrow thoroughbreds and barrel shaped quarter horses, they will have a problem doing it with one saddle. Most people, however, stay with a general type of horse, and fitting that type is the aim of the tree maker. Please note: there is absolutely no standardization between makers as to what quarter horse, full quarter horse, semi-quarter horse, or any other term means as far as trees go. It is better to use measurements to describe a tree precisely, since all of the factors involved in the fit can be changed independently of each other.

We have two common bar patterns we use, and one variation that can be applied to either of them if necessary. We have a "regular" and a "Wade" bar, but the bottom of both types is shaped identically so they fit the same. Any fork with a stock thickness of 4 ½" or more gets Wade bars unless regular bars are requested. Stock thicknesses of 4 ¼" or less get regular bars. The Wade bar has an extra ½" in front of the fork cut to deal with larger stock thicknesses. If requested, we can cut it back to "regular" length to accommodate bulgy shoulders. The Wade pattern is also about ¼" wider (deeper) than the regular pattern except in the center where the rider's leg goes. If the bars are set at the correct angle and width for the horse, the Wade bars will go down the horse's side ¼" further than the regular bars and the bar tip will sit ½" further forward. Other than that the bars will fit the same on the horse's back. All our bars have full stirrup grooves.

The variation we offer is to make a flatter "cup", or amount of roundness, on the bottom of the bars for horses whose wither pocket is flat or bulged out. This wither conformation is often associated with very rounded muscles over the loin area as

well. On Flat Cup bars, the shape flatter in the wither area than our normal bars, but still has some roundness to it, while it is totally flat over the loin. We can make Flat Cup bars on either a regular or Wade bar.

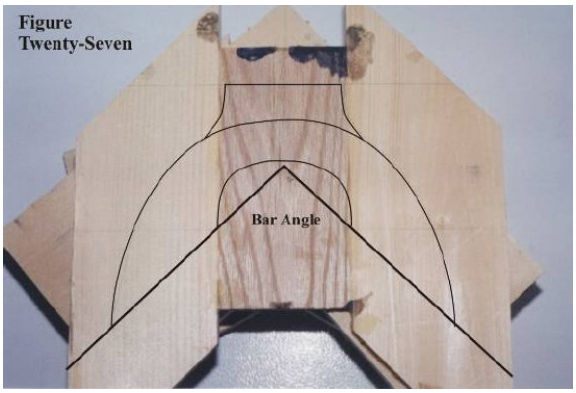
The areas to consider when fitting a tree to a horse are:
A) the width the bars are spread apart (hand hole width)
B) the angle of the bars relative to each other
C) the amount of gullet clearance (hand hole height and gullet height)
D) the length of the bar, including
    1) total length
    2) length of the front bar tip
E) the shape of the bottom of the bar, including
    1) cup
    2) twist
    3) rock.

A.) The width the bars are spread apart (hand hole width):

There are four basic hand hole widths that will cover the vast range of horses. Note that the width between the bars at the cantle is always ½ inch less than the hand hole width on our trees. We measure these in the wood, not the rawhide, on our trees. (The rest of our measurements, with the exception of stock thickness, are in the rawhide.) The 3 ¾" measurement fits narrower horses with good withers that are in working shape with a well defined wither pocket. This includes most thoroughbreds and thoroughbred crosses. It is less forgiving of the extra pounds than the 4" tree, and it will sit higher on a rounder backed horse than the 4". The 4" measurement will fit the highest percentage of horses in western North America, which is why the majority of trees we make are 4" wide. The 4 ¼" measurement is used for broader horses that need the extra width. We are now making some trees with a 4 ½" measurement for the very wide, broad backed horses that are becoming more common.

The ideal is for the bars to have contact with the horse over as much surface area as possible. A tree that is too narrow contacts the horse only on the lowest part of the bar, with lots of air space under the top edge of the bar. It will also sit higher than a better fitting tree. A tree that is too wide will sit lower, with the top of the bar contacting, and the bottom of the bar coming off the horse. There is usually one width that is ideal for each horse. However, if the shaping of the bottom of the bars is right, a tree that is slightly narrow will just sit a bit higher, and a tree that is a bit wide will sit slightly lower, but neither should cause problems for the horse. The majority of problems here come from wide horses with trees that are much too narrow, so that only a bit of the bottom of the bar actually contacts the horse, and that part digs in with too much pressure.

B.) The angle of the bars relative to each other:



When a tree is made, the angle for the bars is marked on the fork before cutting it out. (Figure 27) While different makers may mark the same angle here, other angles used in cutting out the fork come into play as well as differences in shaping of the bottom of the bars. This means that one maker's 90° bars may not fit the same as another maker's 90° bars. Saddle makers need to be aware of this fact if they change tree makers, and check out the fit with the first few trees they order so they know what they are getting.

The most common angle we use is 90°, which will fit the majority of horses. For your wider backed, flat backed, or mutton withered horses, 93° will fit better. It may also be a good compromise for someone who rides a range of horse types. We have also started using 95° for some extremely wide, flat backed horses. Trees that have a 3 ¾" hand hole width would generally have bars set at 90°. A 4" hand hole width tree would usually have 90° bars, but may have 93° as well. A tree with a 4 ¼" hand hole width would be made with 93° bars, since most of the larger horses needing that width also need the bars angled out bit. A horse that needs 95° bars would generally need the 4 ¼" or even 4 ½" width. However, there can be exceptions to these generalizations.

The three degree difference between 90 and 93 doesn't sound like much, and in actually only makes about 1/8" in the measurement across the bottom of the bars. On a narrower horse it is hard to see any difference in fit. But you can see the difference on the wider horses, as the bottom edge doesn't dig into the horse. With too much angle, the bottom of the bar starts lifting off the horse. Too little, and the top doesn't contact. Again, the biggest problem we see is very large horses with too little angle causing the bottom of the bars to dig into the horse.

C.) The amount of gullet clearance (hand hole height and gullet height):

Clearance is determined by a number of factors. It is best measured by hand hole height, though gullet height is a consideration on trees with a larger stock thickness. (See the information article Using Gullet versus Hand Hole Measurements.) With our bar patterns, which are quite deep, a hand hole height of 6 ¾" will clear almost anything if the bar width and angle are chosen correctly. 6 ¼"to 6 ½" are average heights, and 6 inches is generally a minimum hand hole height, though a really mutton withered horse will get away with less.

The actual clearance between the gullet and the horse's wither depends not only on hand hole height, but also on width and angle of bars. All three things work

together to affect clearance. There are two components to the hand hole height - the contribution of the fork and the contribution of the bars. A narrow tree will have more clearance on the same horse than a wide tree when the hand hole height is the same, because the narrower tree will sit higher. A wide tree with the same hand hole height as a narrow tree might hit the wither of the same horse because it sits lower down on him. It is best to determine the correct bar width and angle to fit the horse's back, and then choose the hand hole height needed to clear the withers. A narrow horse with a high wither might not hit a high gulleted, wide, flat angled tree. But a narrower tree with a lower gullet won't hit either, and would fit the horse better. Some customers want their saddle to "sit right down" on their horse for roping, and so will order a really wide tree. The better option is ordering the correct width and angle, and a low hand hole height. In both cases, the gullet is low down to the horse, but in the second the saddle will be more stable because it fits and the horse will be more comfortable.

The shape of the gullet is also important. A gullet that is thick throughout and bulges down will have less clearance than a gullet that is scooped out well. The former can contact a horse that the latter would clear, even with the same gullet height and hand hole height measurements. We scoop out the gullet as thin as we can and are still confident in the strength of our forks because of the materials we use to build them.

As far as the horse side of things is concerned, the height of the wither is the most important factor. Short withers are not a concern as far as contacting the gullet. Tall withers may be a problem, but the shape also plays a big role here. Some horses have tall withers which don't start to rise till they are ahead of the saddle. Other horses have tall withers which extend further back, right under the gullet. These are the type that tend to have problems with clearance, and where hand hole height rather than gullet height is very important.

D.) The length of bar:

Total length: We do not have a standard bar length. Rather, we have 6" of bar behind the cantle cut on the bar, and 5" (regular bars) or 5 ½" (Wade bars) in front of the fork cut on the bar. The distance between the cuts changes with the seat length and all its variables. The longer the bar, the more surface area the rider's weight is spread over and the better it is for the horse. This holds true until the bar gets too long, and starts getting too far back on the loins. Bars that are too short can be a problem if there is not enough surface area to spread the weight that is put on them, and the horse gets sore from the excess pressure. A bar that is too long may rub over the loin area as the horse moves, and may even dig in, causing pain if there is not enough rock in it to prevent excess pressure at the back of the bar. If a customer rides Arabs or youngsters, yet wants a long seat length, the bar length may need to be shortened. If we know this, we can discuss various options to shorten the bars.

We do have a minimum and a maximum bar length. Minimum is 22" unless it is for a kid's saddle. Maximum is 24 ½". The measurements for Wade bars are ½" longer due the longer bar tip. For seat lengths that go outside these parameters, we generally change the amount of bar behind the cantle, though there are other things we can do to avoid problems with bar length. We can discuss this with you when needed.

Length of the front bar tip: There is always a concern that too long a bar tip may interfere with the horse's shoulder. The shape of the bar tip is important in determining whether it will bother a horse or not, but the primary factor is the shape of the horse's shoulder. A heavily muscled, "bunchy" shouldered horse will have more problems with this than a more narrowly built horse with flat shoulders. There are differing opinions about how to deal with this problem. In looking at trees on these horses, it appears that on horses with flat shoulders the wither pocket determines where the bar sits. On horses with bulging shoulders that extend back into the wither pocket, and horses that are built "downhill", it is the shoulder and not the wither pocket that determines where the front of the bar comes to rest. Some makers will flare the bar tips more to help fit these horses. We feel that the tree will just move forward more on the horse till it gets narrow enough to be stopped by the shoulders. This allows the bar tip to ride over top the moving shoulder blade, possibly causing irritation. Our chosen option is to cut back the bar tips, especially on Wade bars, allowing the bar to move forward so the cup of the bar fits into the wither pocket as intended. This will, however, leave less room on the bar ahead of the fork to the saddle maker to work with. If a customer rides larger shouldered types of horses, please let us know so we can modify the bars accordingly.

E.) The shape of the bottom of the bar:

There are three curves on the bottom of every bar that are critical to the fit for the horse.

Cup is the curve from side to side (the amount of roundness) that fits into the wither pocket and flattens out over the loin. We offer the standard cup that seems to fit the vast majority of horses, but now offer the flattened cup for the really flat backed or round withered horses that need that fit. If the cup is too round, the bar will only have contact in its center, eventually leaving those small white patches we all see too often. It will only contact the loin over a small percentage of its area as well. If the cup is too flat, the top and bottom of the bar hit, leaving the center without pressure. It needs to be recognized that fat, out of shape horses will always have more central pressure than is ideal, but it should not cause soreness. In the same way, horses with bulging muscles in the wither pocket area will almost always dry spot, even with a flatter cup to the bars. But they generally won't be sore unless the bar is really rounded.

Twist is the difference in angle from the front to the back of the bar. While some people feel this should be changed at times, we have found that it changes very little between horses, and even mules. It rarely, if ever, needs to be modified.

Rock is the total curve of the bottom of the bar from front to back. In looking at different horses, the amount of rock seems to vary quite a bit regardless of age, and we know that it tends to increase in an individual horse as he ages. Yet there is no measurement or number you can give to specify the amount of rock you prefer. We work to make the rock as consistent as possible between all trees. We can increase rock if you want for sway backed or older horses, or decrease it for young horses and mules. However, you must realize that the tree will not fit your average horse as well if you make these changes. A tree with excessive rock will end up putting too much pressure on the center part of the bar. A tree with not enough rock will "bridge", putting pressure only on the front and the back of the bar, and not touch in the middle. A question that leads to interesting discussions is, "If you had to choose between a little too much rock, or not quite enough rock, which would you choose?" There are reasons to choose both sides, but we fall on the "too much rock" side. It seems that the problems caused by bridging saddles are more severe than saddles with too much rock. Practically though, unless the problem is severe either way, a well shaped bar that fits properly in width and angle will rarely sore the horse.

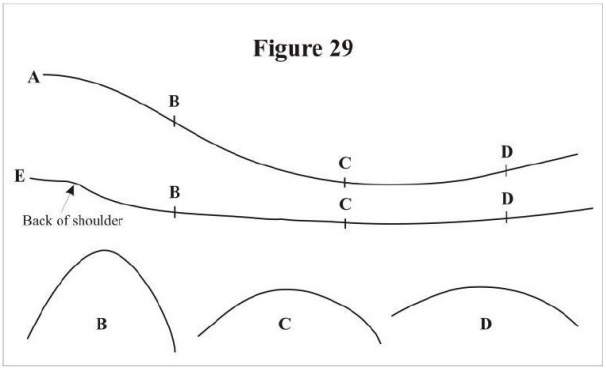

Figure Twenty-Eight

The shape of the bottom of the bar is the reason we won't make a bar without a full stirrup groove. Such bars are often called Arizona bars. Figure 28 shows the skirts and the matching rawhide from a tree without a back stirrup groove. Notice the heavy wear from excess pressure where the stirrup leather sat, the total lack of wear behind it where there was no contact between bar and horse, and the return to wear as the contact resumed. The problem is that the back of the stirrup leather causes a lump where it goes over the bar, and creates a pressure point which can sore a horse. This results in the thickness of the stirrup leather becoming a determining factor in the amount of rock. Some makers try to compensate for this by hollowing out the bar behind the stirrup leather, essentially making a long, gradual stirrup groove. This results in less surface area on the horse's back, which is not good either. The original reason for the Arizona bar was due to breakage at the stirrup groove. With good quality wood and rawhide and a decent bar depth, strength should not be an issue, and we have not had problems with breakage on our trees. The stirrup leather lump and the compromise on fit precludes us from making this type of bar.

Fitting specific horses:

The majority of horses can be fit well by determining what general body build they have and talking to us about them. But what if you have a customer with a very special (to them) awkward-to-fit horse? They first need to realize that a tree made to fit their awkward horse will probably not work really well on the majority of horses. When their old, sway backed horse dies, this saddle will not fit the two year old replacement very well, and they need to consider the financial commitment in getting a saddle primarily for this horse. If they want to go ahead, they can do a few things that will help us get it right. Sending this information to us can also be done for any horse if you have questions about fit.

A) Line drawings of the horse's back.



Have the horse stand as squarely as possible on as flat a surface as possible. Take a coat hanger, a flexible curve or any other piece of malleable wire, and bend it to fit along the top line of the horse's back from wither to loin. Then trace this line on a large sheet of paper. (Figure 29 A) This gives good information about wither height. Using a level to find a true horizontal line, and marking that on the top line is very helpful to us as well. Next, using the same wire technique, make drawings of at least three places across the horse's back, and mark on line A where they fit. (Figure 29 B, C, and D) Drawing B should be where the bar fits in the middle of the wither pocket. Drawing C should be centered under the tree, at the back of the stirrup groove, and Drawing D should be over the loin where the back bar pad rests. This gives information about how wide apart the bars should be placed, and what angle would be best. Marking B, C and D on line A tells us more about where the wither pocket (and therefore the shoulder) is relative to the wither. For a horse with tall withers where clearance may be an issue, an additional drawing made across the horse's wither at the position of the lip of the gullet is very helpful. This technique has been used for years, and if used correctly, it gives good information regarding needed width and angle of bars, and gullet height. What it doesn't tell us is anything about rock. The top line does not accurately approximate the curve of the horse's back where the bars go. To get this information, make another drawing by placing the wire along the side, running from the tip of the back of the bar, under the bar, and coming out where front point of the bar tip would rest. Continue forward over the shoulder for about six inches. (Figure 29 E) Mark on this line where lines B, C and D cross, as well as the back of the shoulder. This gives information both on rock and the shoulders – how prominent they are, and how far back they come relative to the withers. Figures 30, 31 and 32 show a horse with tape marking where the lines should be taken.

B) Pictures of the horse's back.

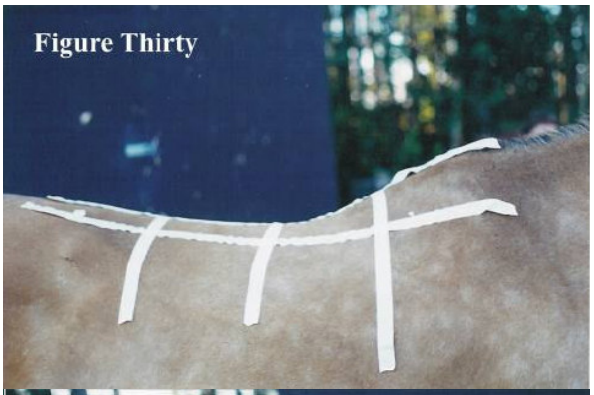


Figure Thirty


Figure Thirty-One


Figure Thirty-Two

With the horse standing as level and square as possible, take a number of pictures of each side of the horse's back from four different angles – side, angled from the front, angled from the back (Figures 30, 31 and 32), and from directly behind the horse looking toward his withers (not pictured). The picture from the side (Figure 30) gives the best information about wither height, the relative positions of the withers and the shoulder, and whether the horse is built downhill or more level. The picture angled from the front (Figure 31) gives the best information about rock. The picture angled from the back (Figure 32) shows the prominence of the shoulders. The picture taken directly from the back gives the best indication of width and angle. If you put tape or hold a flexible curve on the horse where you would take the measurements for line drawings it lets us see more clearly the actual curvature of the horse. For example, this horse has a lot of rock in his back, which is most easily seen in Figure 31.

If possible, using one of our trees, take pictures of the tree on the awkward horse. Take close ups, if possible, showing areas of concern. Pictures of another maker's tree are not especially helpful, since the measurements, angles and shape will all be different.

C.) Other measuring devices.

There are many other products available to help communicate back shape to tree makers. If you have a favourite, tell us about it. We are willing to use anything that helps.

The proof of the pudding…

is in the eating. The proof of the fit is seen by putting one of our trees on a few horses, or better yet, getting it built and riding it on a few horses. Due to the differences in how trees are built, every maker's trees will fit differently. Once you have one tree, you will have a better understanding of how our trees fit, and what you may need to change in order to fit different types of horses.