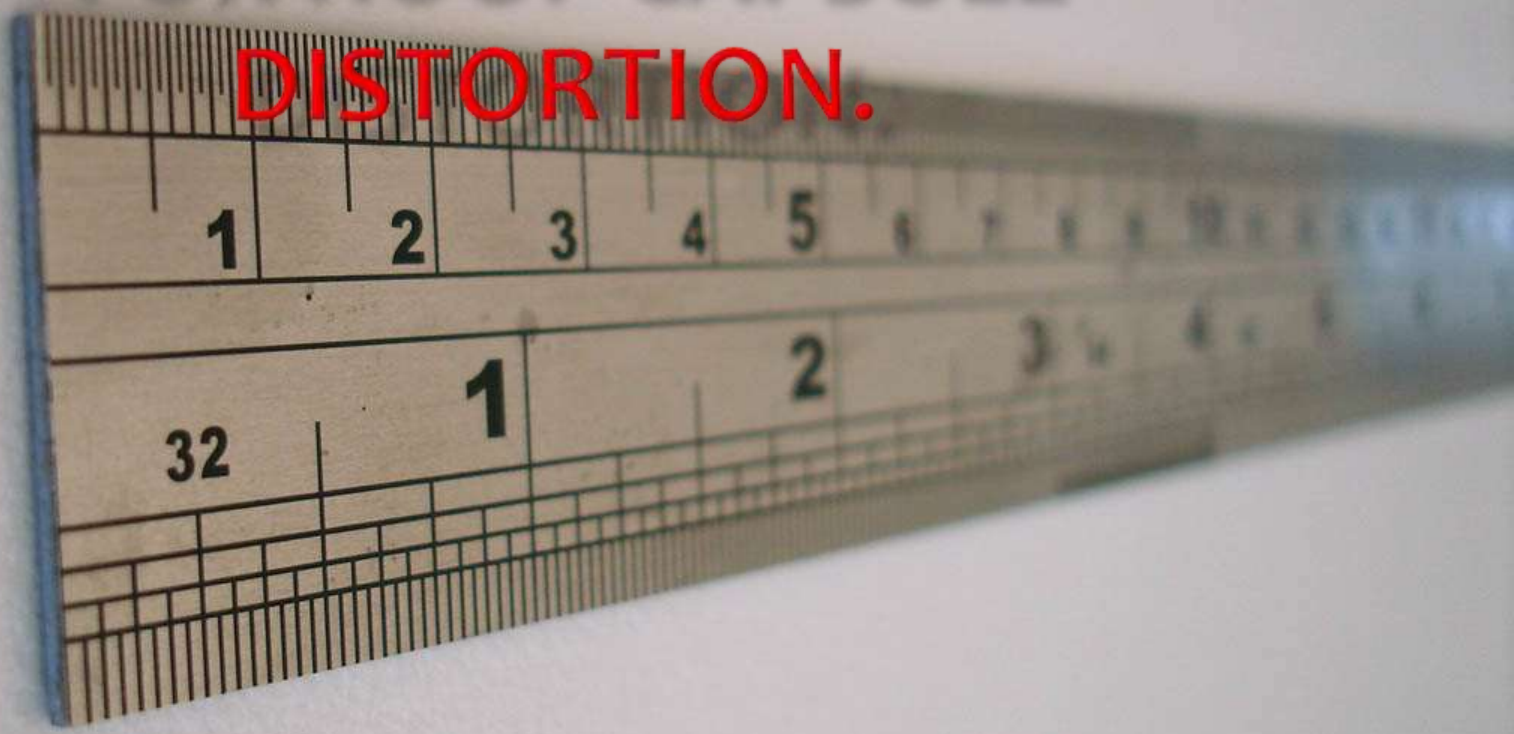
HOW TO CALCULATE MATERIAL LENGTH NEEDED ALLOWING FOR HOOF CAPSULE DISTORTION.



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Introduction

- The traditional method of calculating the length of material needed to make and fit horseshoes is well documented.
- The traditional method is add 2 inches for a front shoe and 1½ inches for the hind. Anyone who has applied this method is probably well aware that all too often the calculation does not work consistently.
- The most common outcome being that the shoes you make are too short.
- Another method commonly used is the double the length calculation but this also inconsistent.

The problem

- The main problem with the traditional method is that it's based on the 'ideal' foot. We all know there a very few of those feet out there.
- So, what is the 'ideal' foot?
- Well a foot that is geometrically proportioned should be ¼ inch longer than it is wide, so a foot that is 5 inches wide *should* be 5¼ inches long to the last weight bearing point of the heel. Only when this relationship between width and length is present does the 2 inch for fronts and 1½ inch for hinds work.

The Solution

- My method of calculation is based on proportion and more specifically looking for dis-proportion.
- Dis-proportion in the case of the hoof capsule is known as distortion.
- The dictionary states that proportion means the ‘proper relation between things or parts’ *or* ‘A portion or part in its relation to the whole’
- Only when we can spot this and appreciate it can we accurately calculate how much material (steel) we need to cover the foot.

How to check for distortion.

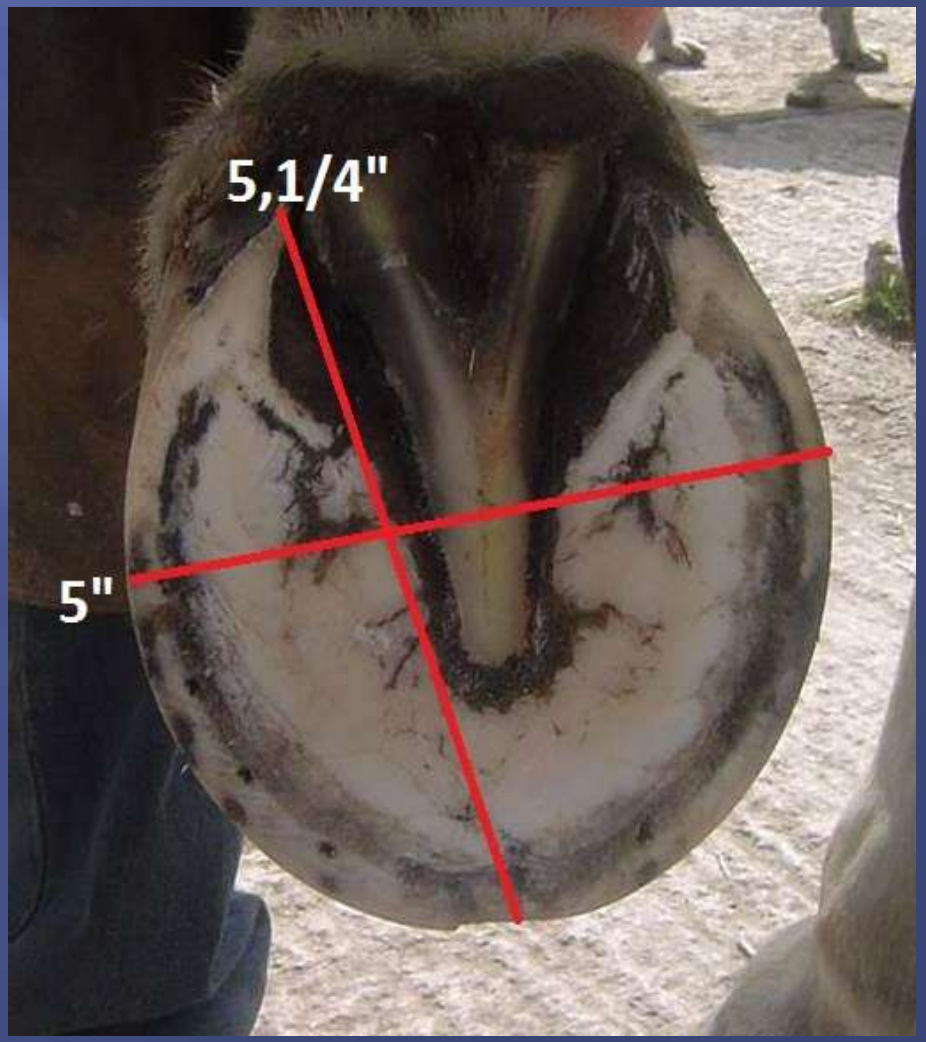
- First measure the width of the foot from its widest point.

How to check for distortion.

- Next measure the length from the centre of the toe to the last weight bearing point of the heel.
- **Do Not** measure to where the shoe will be fitted to.

How to check for distortion.

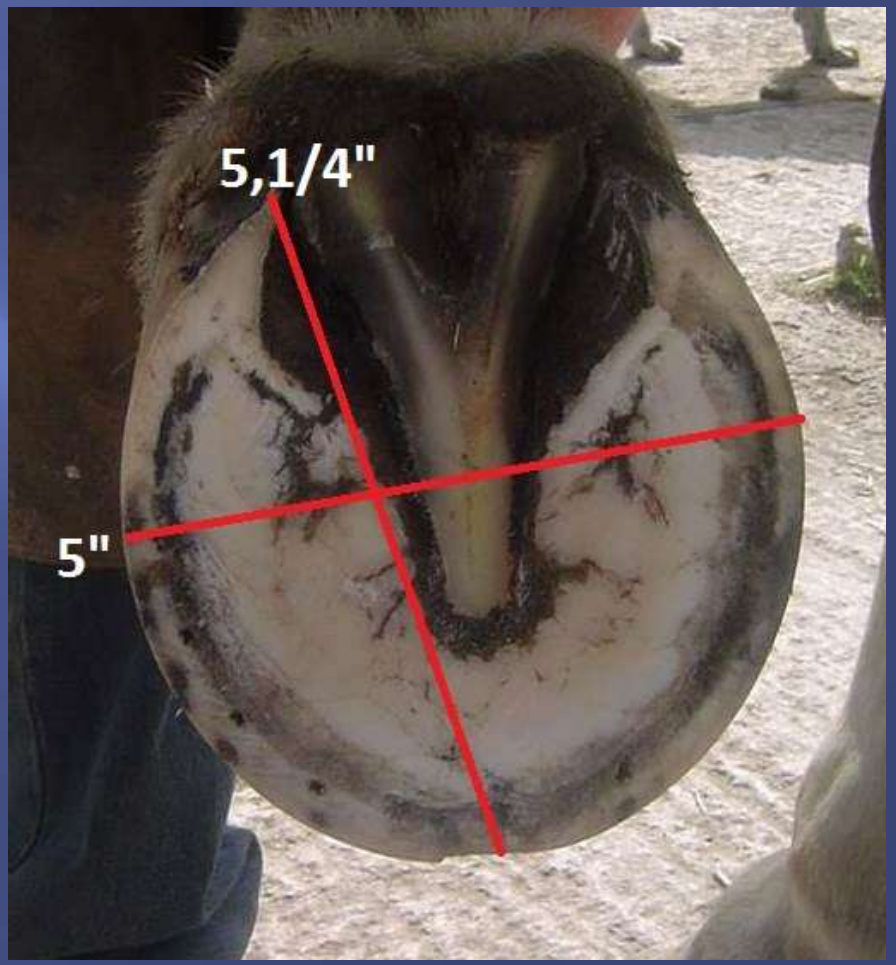
- On the normal (un-distorted) foot this should give you a measurement that is ¼” longer than it is wide.
- If this measurement is present there is no distortion and the 2” rule applies.



How to check for distortion.

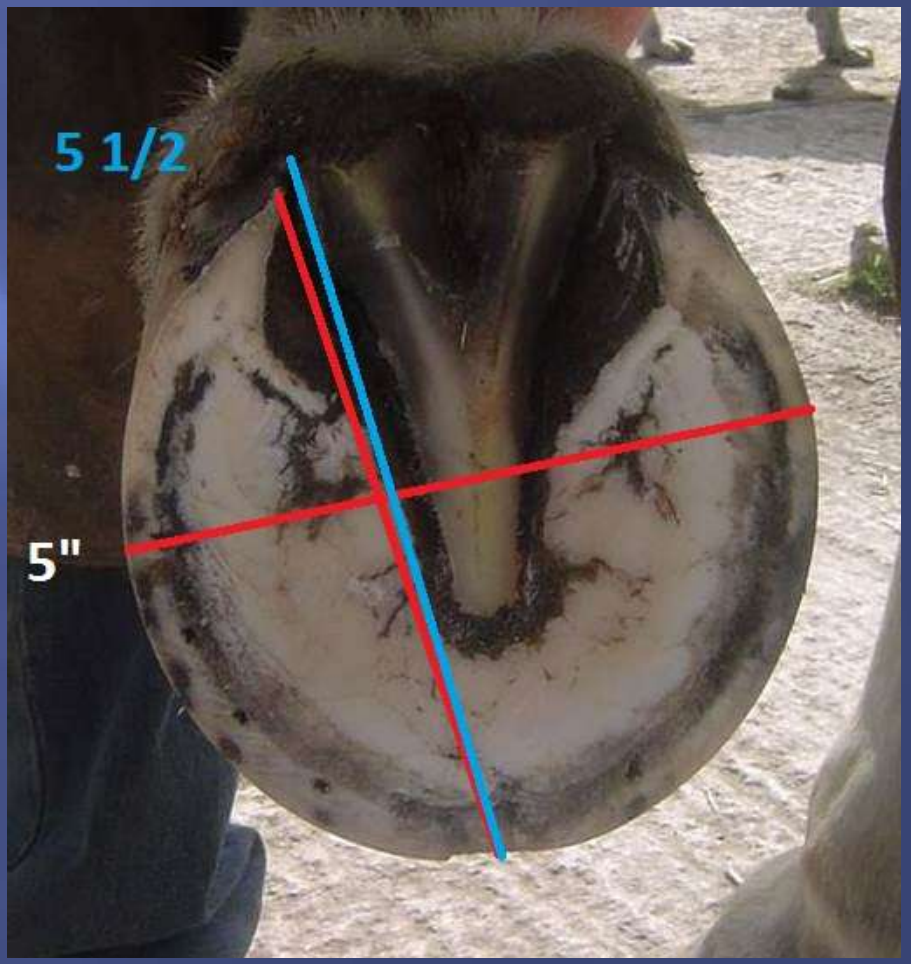
- The material calculation for this foot for a ***Hunter fit*** would be.

- 5 + 5¼ + 2 = 12¼



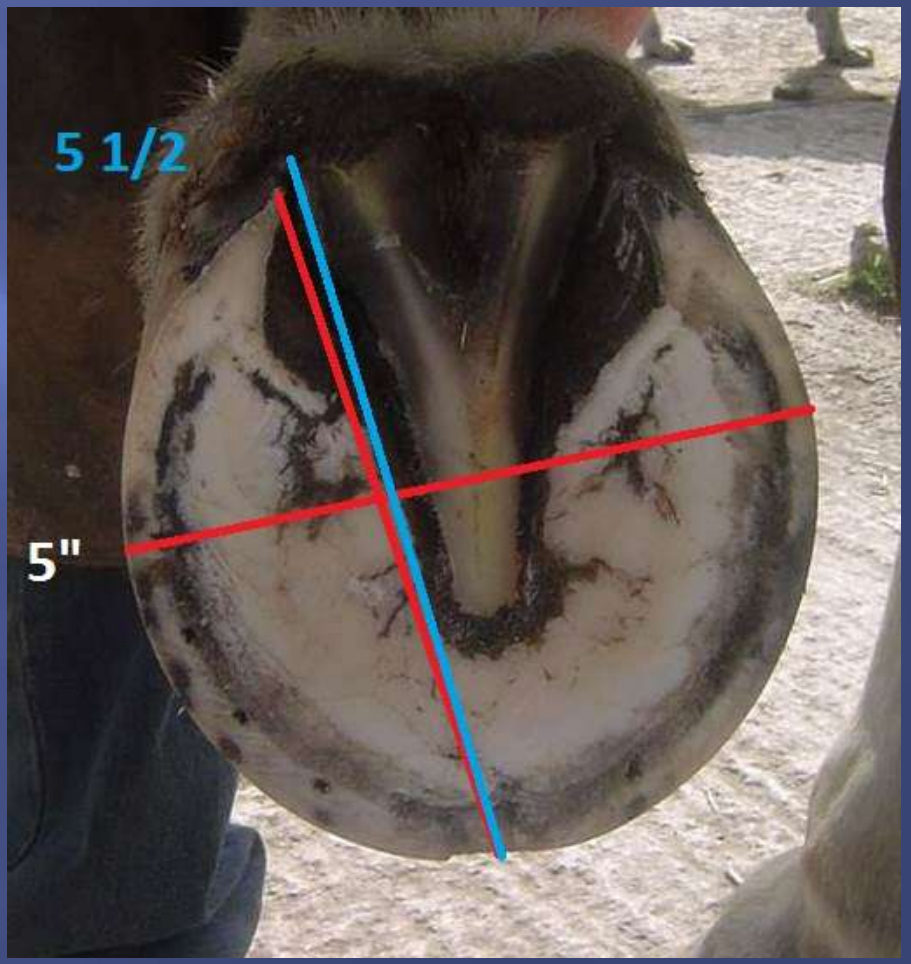
How to check for distortion.

- For a ***Leisure fit*** (widest part of the frog) you will need to re-measure the length, this time measuring to ***where you want to fit the shoe to.***
- This usually adds about ¼” to the heel measurement.



How to check for distortion.

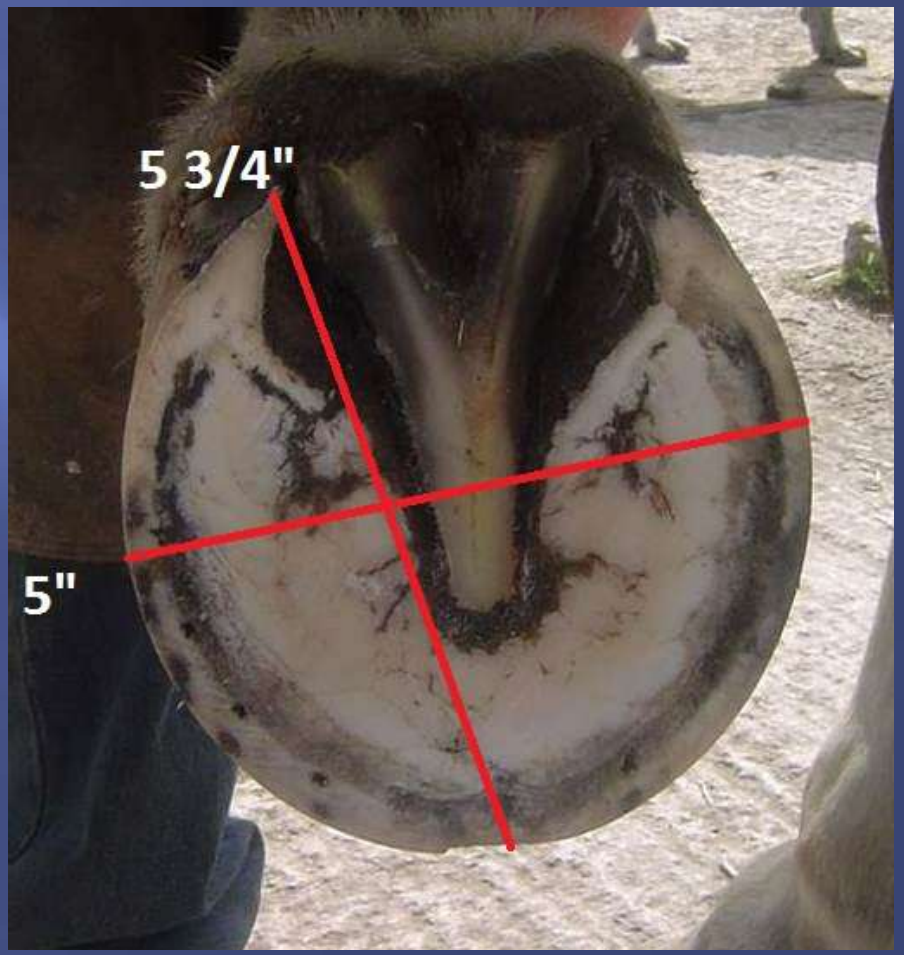
- The material calculation for this fit type would be
- 5 + 5½ + 2 = 12½”



How to check for distortion.

- This foot is distorted by ½”.
- Make a note of it on your piece of paper.
- The calculation for this foot for ***hunter fit*** is as follows.
- 5 + 5¾ +2 +½ = 13¼

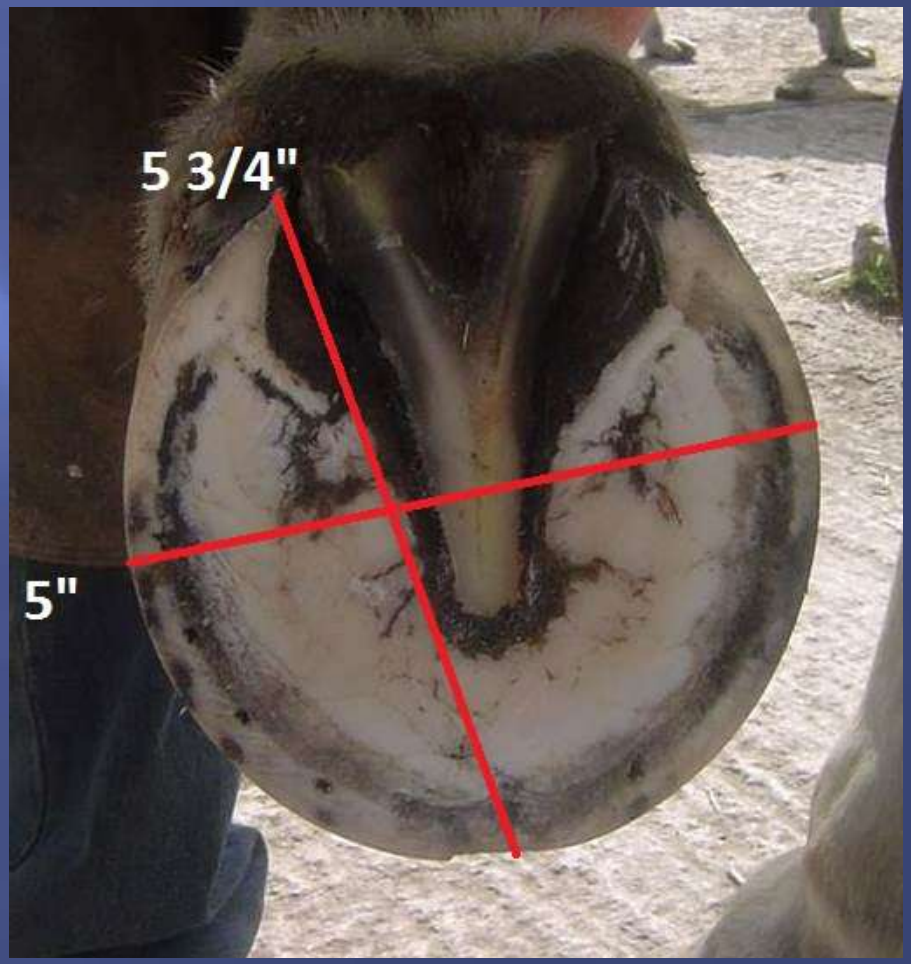
* This is the distortion added into your calculation.



How to check for distortion.

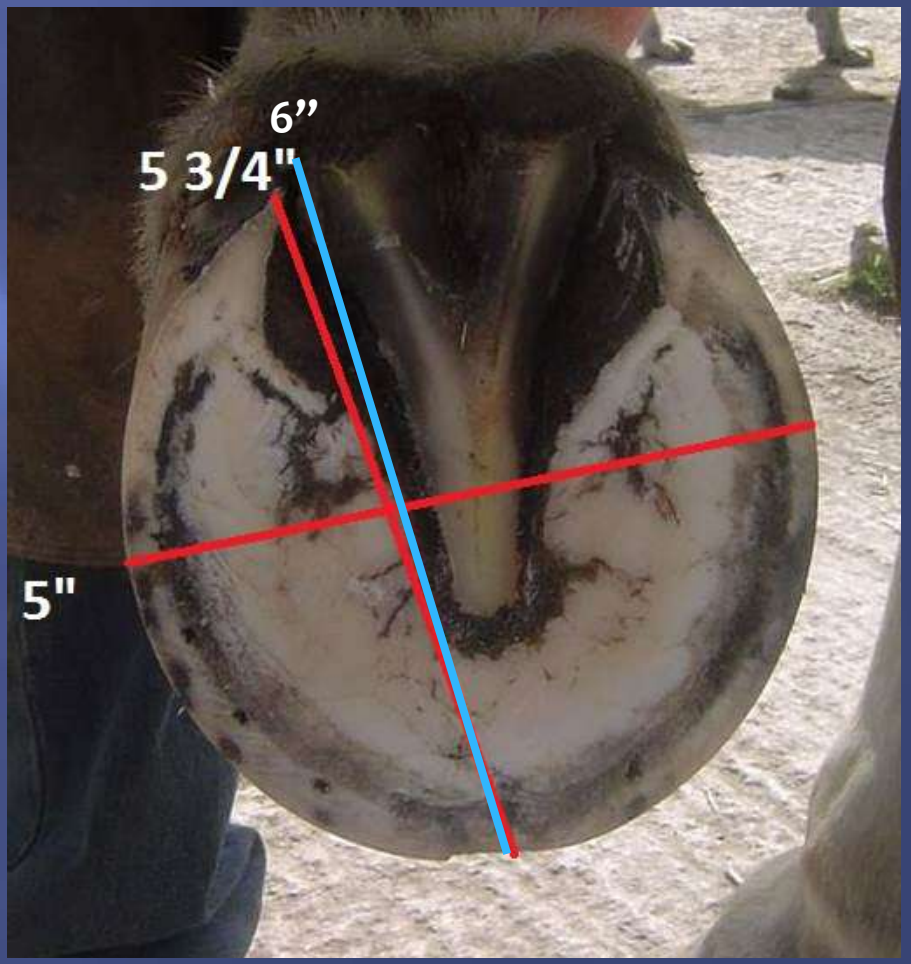
- ***Hunter fit:***
- The traditional method for this would be:
- 5 + 5¾ + 2 = 12¾
- The distortion method gives you:
- 5 + 5¾ + 2 + ½ = 13¼

- This is the difference between getting on the heels and having to stretch the material to get there.



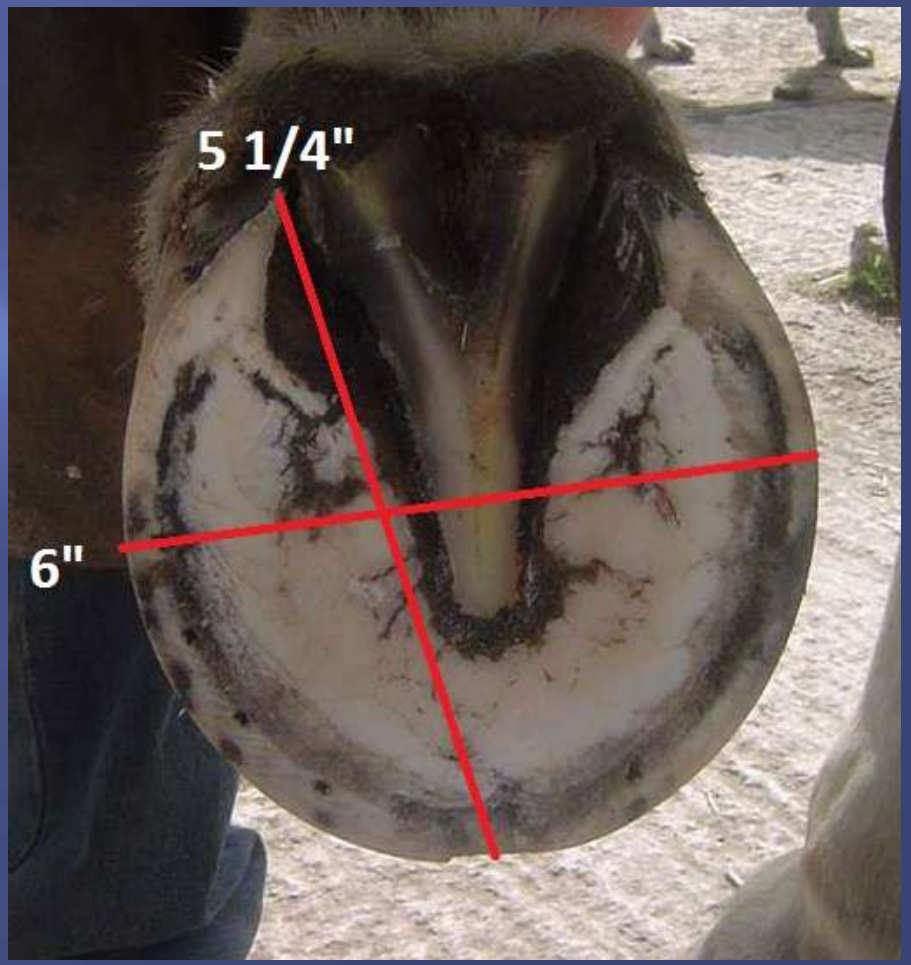
How to check for distortion

- ***Leisure fit:***
- Once you have worked out the distortion (remember to measure the foot only)
- Traditional method:
- 5 + 6 + 2 = 13”
- Distortion method:
- 5 + 6 + 2 + ½ = 13½
- Again this is difference between getting there comfortably verses stretching the material just to get on the heels.



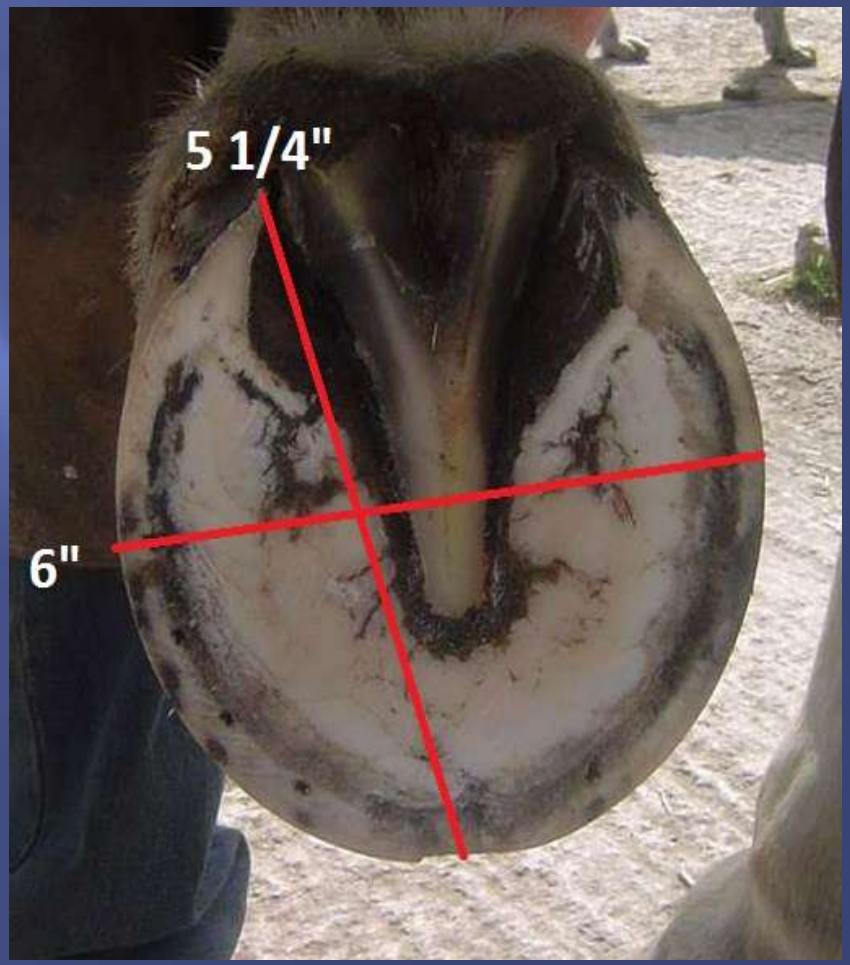
Reverse distortion.

- Some feet are wider than they are long. The distortion calculation for these types of feet remains the same.
- The photo shows an example of a foot that is wider than it is long.
- Mathematically this creates a minus figure, in this case its - ½” all you simply do on occasions like this is turn the minus into a plus.
- So the distortion is +½” on the foot shown.



Reverse distortion

- Perhaps a simpler way of working it out is to look for the smaller number (whichever that may be) and then look for the other number to be ¼ longer.
- If it isn't and in the case of reverse distortion it rarely, if ever will be, you need to apply the distortion calculation. Everything else after that is just down to shape.



Fullered shoes or any other variant.

- The distortion measurement is applied ***after*** all the other calculations and variants are measured and applied.
- So it really doesn't matter what you make as long as you check for distortion and apply the calculation ***at the end.***

Fullered shoes and variants.

- The material added for ¾ fullered and plain stamped shoes varies from farrier to farrier.
- How much you individually add for these shoe types is irrelevant to the distortion calculation.
- That is why it's important you add the distortion measurement at the very end after all other variants are accounted for.

Fullered shoes and variants

- Most farriers only add 1½ inches for the toe bend on a ¾ fullered front and 1” for a fully fullered due to the stretching of material that takes place during the fullering process. Some farriers who work their steel more than most may only add 1 inch for a ¾ fullered and ½ inch for a fully fullered.
- It really doesn’t matter as long as you apply the distortion last and are not temped into ‘offsetting’ the distortion against your usual toe bend measurement.

Fullered shoes and variants

- The **foot** measured 5 + 6 so the distortion is ¾”. The calculation for my personal measurement for this foot would be
- 5 + 6¼ + 1¼ + ¾ = 13¼” of 1” X ⅜” flat bar. Your measurement will vary depending on how much you add for the toe on a fully fullered.

Bar shoes

- The same system can be used for make and fit bar shoes or any other variant possible as long as you apply the distortion measurement ***after*** you have calculated all the other variants.
- ***Remember to measure the foot only first to work out your distortion.***

Summary

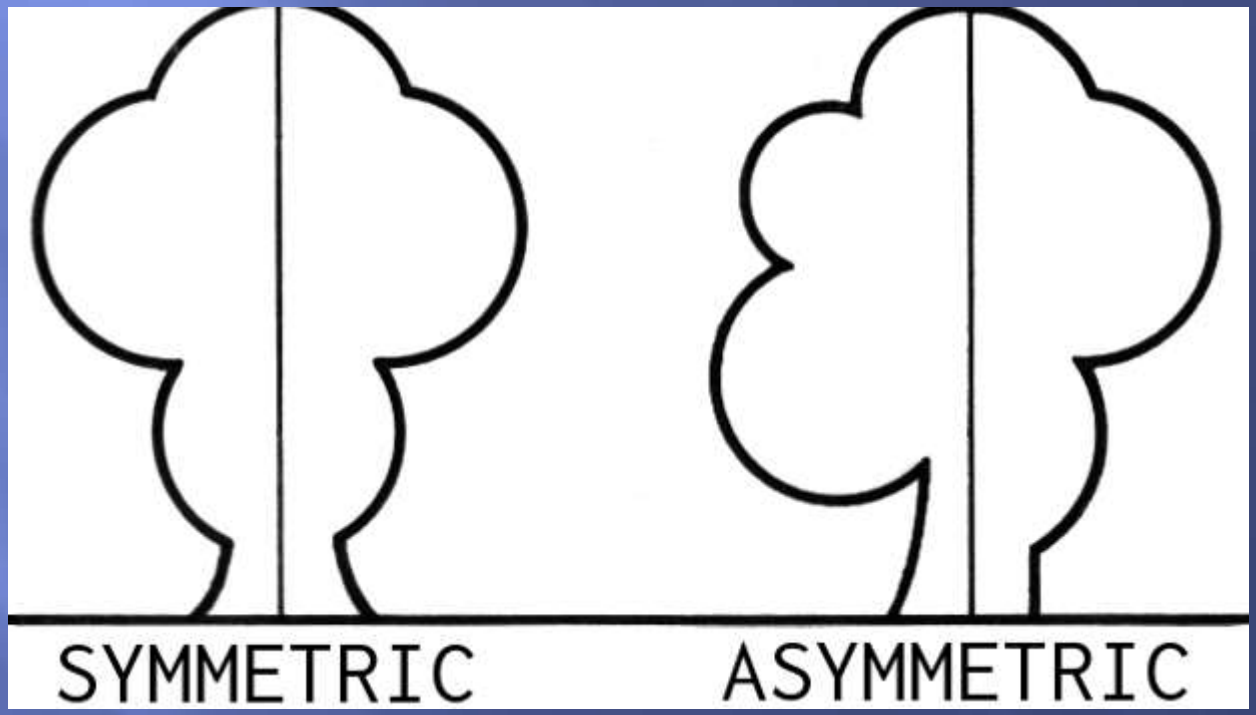
- This method of calculation is based on proportion, or more specifically, lack of proportion.
- The traditional method of calculation does not account for lack of proportion and as a result will consistently let you down for no apparent reason.
- The simple truth about the traditional method is that it applies a generic number based on an ‘ideal’ model that nature created.

Summary

- The problem we as farriers face is an all too common one. Domestication, environment and poor breeding are all important factors that affect foot shape/ balance and as a result they render the traditional method of calculation obsolete.
- Small amounts of distortion in the hoof capsule ¼ - ½" is impossible to spot with the naked eye as this small degree of distortion over a 14" foot may not be immediately visible.

Summary

- Only by recognizing and allowing for hoof capsule distortion can we have any hope of accuracy in our calculations to determine the length of steel required to correctly shoe the horse.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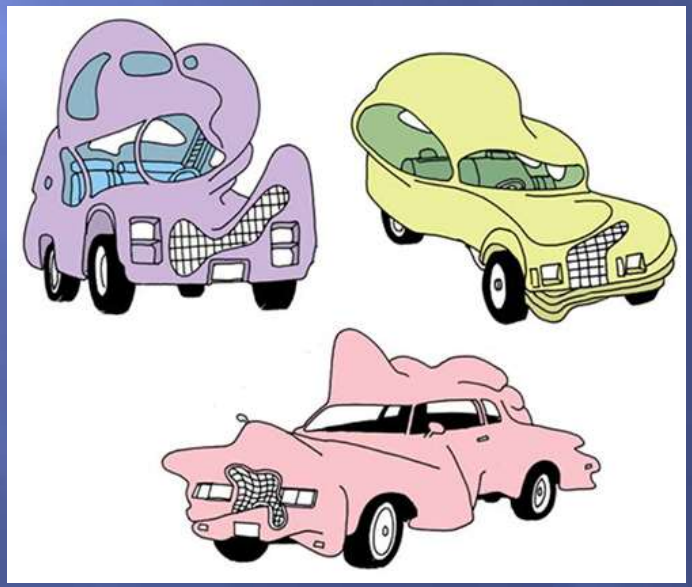

Thank you