DIY 3D Model for Fitting Saddles to Your Fjord

By Cherrie Nolden, Education Committee Chair, VP, Secretary, FjHI liaison

One of the most frequently asked questions I've seen in the Fjord forums is, "what saddles fit Fjords?" The answers tend to be numerous and varied, which is to be expected given the huge variation in the shape of backs in our Fjord population. Since I have 49 Fjords, and have produced more than 150 Fjords over the last 3 decades, I've seen this back shape variation first-hand. There isn't one saddle that will fit them all, or even a majority of them. So, how to find a saddle that fits your particular Fjord, becomes the pertinent question.

I recently attended a saddle fitting clinic by David Genadek, from About The Horse, Inc. He showed a method for creating an inexpensive 3D model of your particular horse's back shape, which can be used to assess whether any saddle will fit your horse. I will show you how to make this 3D model of your Fjord for saddle shopping in this article.

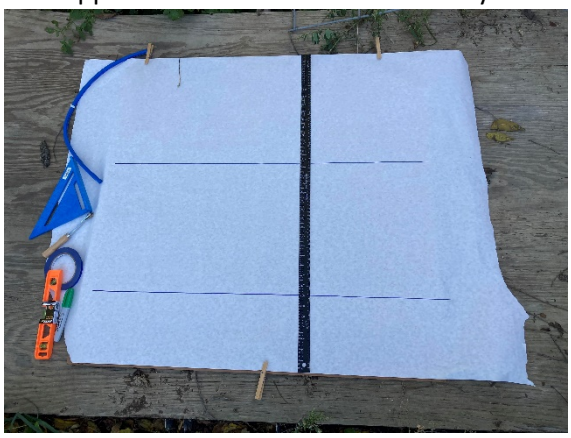
Supplies:

- 3' x 3' piece of cardboard
- 3' x 3' piece of plotter printer paper
- 24" blue flexible tailor's curve
- 3' yardstick
- Square or an L-shaped yardstick
- Level
- Box cutter
- Narrow painter's tape (1/4")
- Sharpie marker or pen
- Needle point pattern tracer

How to make a 3D model of your Fjord:

1. Take all the supplies out to a place where you can tie your horse and the ground is level.
2. Place the cardboard on the ground, the paper on top. Choose an edge and measure 7" up from that edge in 2 spots, making a mark, and use the yardstick to draw a line between the 2 marks.
3. Draw another line 14.5" above and parallel to the 7" line. I used clothes pins to hold the paper in place because my farm is high and windy, so

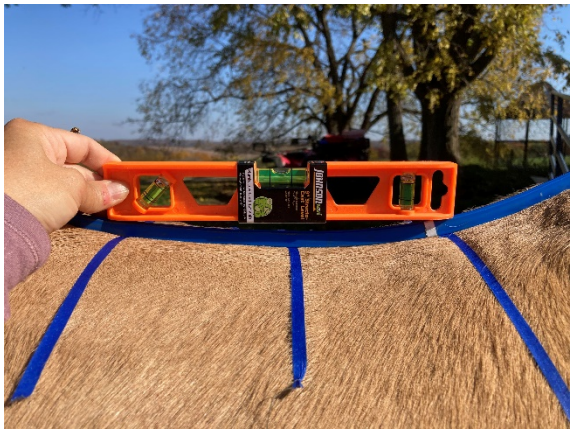
the supplies would otherwise blow away.



4. Tie your horse on a flat surface with its head up in a natural position. Ensure it is standing square and evenly weight bearing while making measurements and tracings.
5. Place 3 long pieces of tape over your horse's back, perpendicular to the ground. 1) at the high point of the withers, 2) at the base of the withers, and 3) where the last rib connects to the spinal column, at the juncture between the T17-T18 vertebrae. This last location is a 45 degree angle toward the head from where the rib disappears under the back muscles as you follow it up your Fjord's side. Our red dun stallion, SOS Rurik is my model for the pictures in this article.

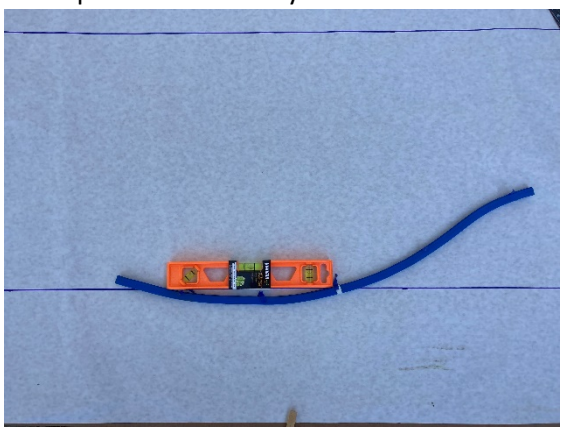
6. Place 2 more long pieces of tape over the spine, halfway between each of the 3 pieces above.

7. Place the flexible curve along the spine, approximately centered over the tape pieces. Mark on the flexible curve, with pieces of tape, where the tape pieces intersect with the curve.
8. While holding the curve in place on your Fjord's spine, slide the level back and forth along the spine until you center the level bubble. Ensure that your horse is standing square on a level surface. Hold that level together with the curved blue shape of your horse's spine topline, and take them over to the paper on the cardboard.

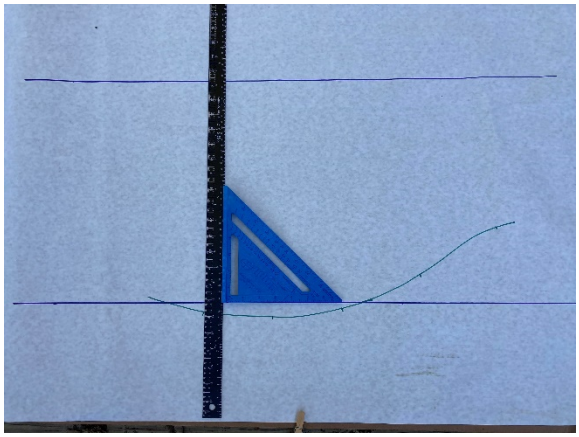


9. Carefully, without distorting the shape of the spine topline in the blue curve, lay the blue curve over and along the 7" line, with the location where each end of the level touches the blue

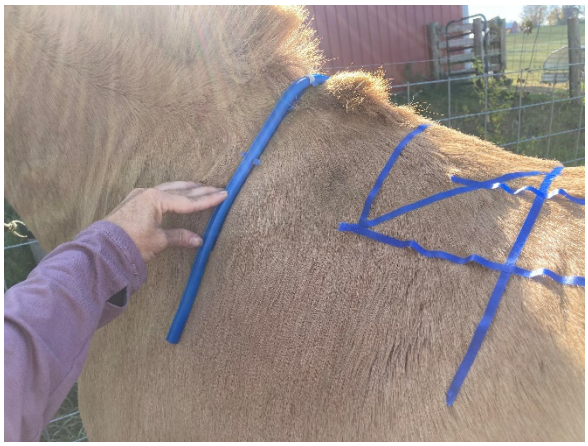
curve positioned directly over the 7” line.



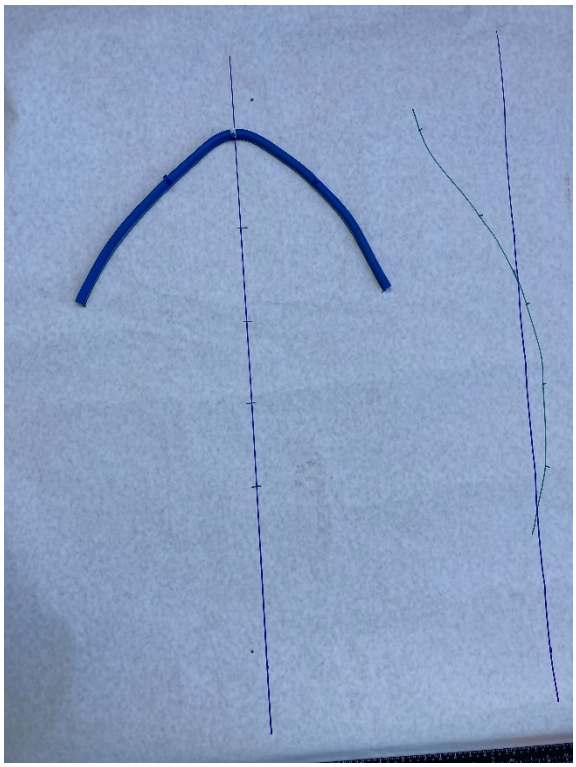
10. Trace the blue curve onto the paper. This is the shape of your horse’s spine relative to a level line.
11. Make hash marks on the traced line where the tape marks are on the blue curve.
12. Using the square and the yardstick, transfer those hash marks directly up to the 14.5” line. This is where you will record the shape of your Fjord’s shoulders and spring of rib, at those tape locations on your Fjord.



13. Mark the center of the blue curve with a piece of tape. Place this on your Fjord’s spine at the tape marking the top of the wither, and push the blue curve around your Fjord’s wither and shoulder to trace that shape.

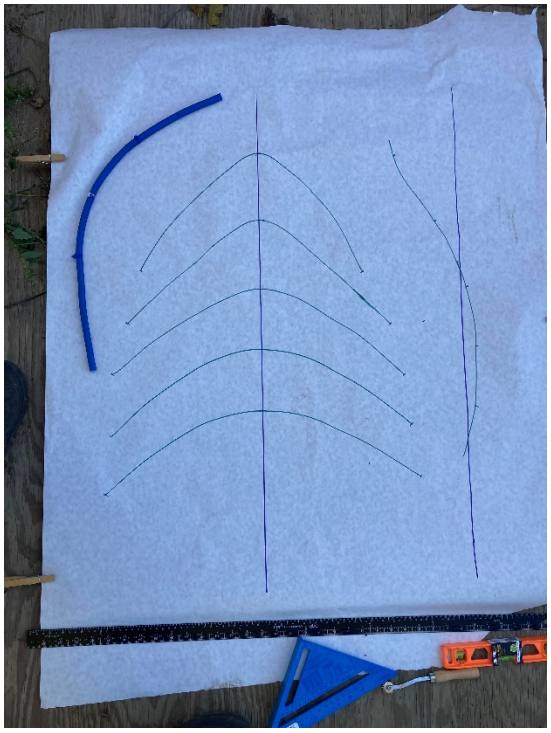


14. Carefully, without distorting the shape, carry the blue curve to the paper. Place it on the wither hash mark at the 14.5” line. Use the square and yardstick to ensure the ends of the blue curve are perpendicular to the level line. Trace the wither shape onto the paper in that location. This uneven chimeric shape is because I didn’t ensure that Rurik was standing square. Try to not make that mistake when making your Fjord’s 3D model.

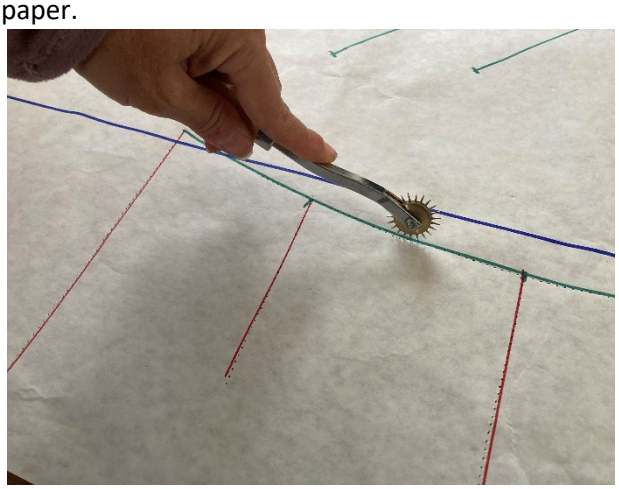


15. Repeat the tracing of the back and rib shape at each of the other 4 tape lines across your Fjord’s

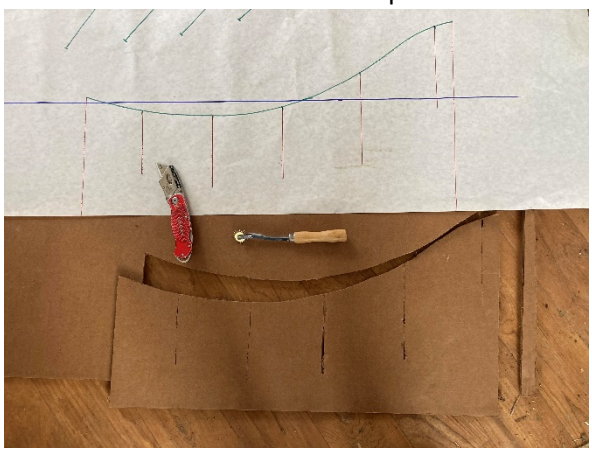
back, transferring the shape to the respective hash mark on the paper. If it's hot outside, put the curve in a bucket of ice water to keep it stiffer between tracings.



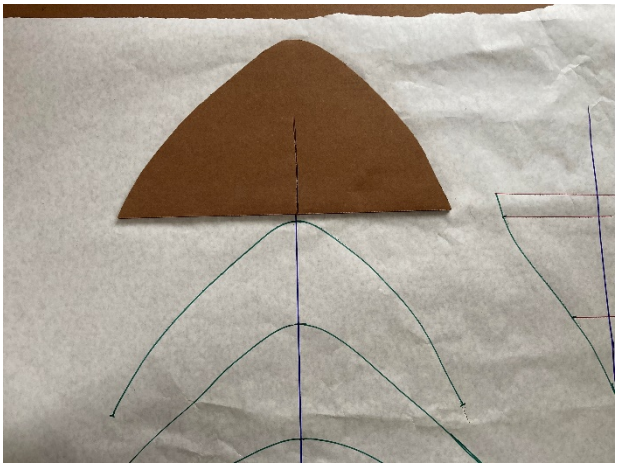
16. Use the needle point pattern tracer to trace the spine shape that crosses the 7" line. The pin pricks will transfer the shape to the cardboard below the plotter paper.



17. Use the square and yardstick to poke a line, from the front and back end of that 24" line, down to the edge of the cardboard. Do the same for each of the 5 hash mark locations.
18. Remove the plotter paper and use the box cutter to cut out the resulting silhouette of your Fjord's spine. Cut a ¼" strip of cardboard out at each of the hash marks, going no further than halfway down the silhouette from the topline.



19. Place the plotter paper back over the cardboard. Feel for where the edge of the cardboard is, and align that with both ends of the wither tracing. Hold the paper in place. Trace the wither shape with the needle tracer, and trace the center line, the 14.5" line. Remove the paper and use your box cutter to cut out the wither and shoulder shape from the cardboard. From the bottom edge of that shape, cut out a ¼" slice of cardboard. This piece will now slide securely into the wither slot on your back silhouette.



20. Repeat this for each of the successive back/rib tracings that you did.

21. You now have a 3D model of your Fjord's back, ribs and spine shape relative to level.

22. Label the paper and the 3D model with your Fjord's name and the date of the tracing. You can always make another cardboard model in the future by saving that paper. It can also be useful for tracking back and shoulder shape changes with body work or conditioning, by comparing this tracing to a future tracing done in the same manner. A tracing like this can be sent to a saddle maker and they can use it to ensure that a custom saddle actually fits your horse.

How to use the 3D model to find a good saddle fit for your Fjord

You can take this model to tack stores or tack swaps to see how your Fjord's back and rib shape fits into existing saddles. You can check to see if the bar of the saddle will place pressure behind the T17/T18 vertebrae. You can see if there is bridging through the center of the saddle bar, as visible by gaps between the topline of your Fjord's rib shape and the saddle bar. You can see if the angles of the bar match the angles of your horse from front all the way to the back of the model. You can see if there will be sufficient spine clearance with the gullet of that saddle. You can see if the saddle will be pitched forward, level or pitched backward on your horse, based on the seat angle and how far from parallel it is with the base of your Fjord's back model.

This cavalry saddle has a bar length that isn't too long for Rurik, but the bar angle at the front is too steep for his shoulders, which causes bridging in the middle of the saddle, where it should be in contact with his back. The angle of the back of the bars is a good match for his back. This saddle would not fit Rurik.

Depending on what theory of saddle fitting you choose to follow, you can use this 3D model to find a saddle that fits. David Genadek from About The Horse, Inc, follows the Jineta style of saddle design and fit. This is a fit that is slightly open in the front and back, with bar pressure in

the middle, where the horse is best structured to bear weight. The open front and back allow space for broad shoulders and thoracic curving of the Fjord in movement, while providing a cantilevered surface for the cantle and pommel of the saddle to support the rider. The gullet of most of his saddles is wider in the back than front, to create a level saddle that doesn't slide forward on a downhill-built horse, which is the most common conformation of horses. These design concepts are those of the Mongolian saddle, with a centered and balanced seat, and its derivatives today. As with all theories, you may have a different theory, and this 3D model can help you evaluate whether the theory you follow identifies a particular saddle as a good fit for your Fjord.

This Crates saddle in the pictures below is probably the closest for a good fit, of the saddles I've tried for Rurik. It doesn't fit because the bars are not flared or a flat enough angle in the front, and there is bridging in the middle, which can be seen in the following photos. It isn't too long for his back, and the bar angels in the back are a decent match.

This picture below is the underside view of an Australian saddle, which is far too long. It extends well past the T17-T18 rib insertion that is the furthest back weight should be borne by the equine back. It also has a lot of bridging (gap of no contact of saddle with the weight-bearing section of the horse's back; Rurik has more rock in his back than this saddle has), so this saddle will place a lot of pressure on the shoulders and loin. Not a good fit. This image shows the center of the back of the 3D model, where there is bridging.

If you have the saddle to try on your Fjord, you can do an even better investigation than just making the 3D model. You can place the saddle where it naturally wants to sit on your Fjord, and put tape on the saddle that matches the tape on your Fjord's body. Then you can take that saddle off, flip it over and fit the 3D model into the saddle, lining up the cross-pieces with the tape locations, and then evaluate how well the saddle tree matches the shape of your Fjord.

You can dispense with the printer paper and directly draw the shapes onto cardboard, but in doing so, you lose your original pattern. The value of the paper is that you can keep that pattern for the future, send it off for a custom saddle to be made, duplicate it easily, or use it to compare the shape of the horse over time by overlaying the papers and looking at the differences.

I hope this article gives you the skills and knowledge to make a 3D model of your Fjord for finding the saddle that is a great fit for his or her particular back shape!

All photos by Cherrie Nolden

Sources of supplies with links:

Blue flexible curve, 24" on Amazon, $11.50, https://www.amazon.com/Flexible-Curve-Pencil-Inking-Edges/dp/B073V48PM8/ref=asc_df_B073V48PM8?tag=bingshoppinga-20&linkCode=df0&hvadid=79852124143911&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4583451672605648&th=1

Needle point pattern tracer, on Amazon, $6.00, https://www.amazon.com/RJWKAZ-Perfect-Leather-Sewing-Tracing/dp/B071P6V4ZJ/ref=asc_df_B071P6V4ZJ?tag=bingshoppinga-20&linkCode=df0&hvadid=80676718050891&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584276296141921&th=1

Roll of 36" wide plotter paper roll, 150' long, $37.00, on Amazon, https://www.amazon.com/HP-Q1397A-Designjet-Format-Universal/dp/B00006BBDR/ref=sr_1_35?crid=2AV2F7F72S64P&keywords=multipurpose+paper+for+plotter&qid=1698707444&sprefix=multipurpose+paper+for+plotter%2Caps%2C108&sr=8-35

36" x 36" sheets of cardboard, 5 pack, $20.00, on Amazon, https://www.amazon.com/Aviditi-SP3636-Corrugated-Sheet-Length/dp/B00BT51X6A/ref=sr_1_4?crid=3MI0LT4YAEQI6&keywords=36+inch+cardboard&qid=1698707618&sprefix=36+inch+cardboard%2Caps%2C182&sr=8-4

Stainless yardstick, $32.00, on Amazon, https://www.amazon.com/Pacific-Arc-Stainless-Rulers-Conversion/dp/B004BNI46E/ref=sr_1_3_sspa?crid=DZCQUJAIQP00&keywords=yardstick&qid=1698707745&sprefix=yardstick%2Caps%2C121&sr=8-3-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&th=1

Square, $10.00, on Amazon, https://www.amazon.com/Swanson-Tool-S0101-7-inch-Square/dp/B00002255O/ref=sr_1_15?crid=3FA0O1M2ZC2EH&keywords=square&qid=1698707877&sprefix=square%2Caps%2C137&sr=8-15

9" Level, $9.00, on Amazon, https://www.amazon.com/CRAFTSMAN-CMHT43191-MAGNETIC-TORPEDO-LEVEL/dp/B08DJDWHQ9/ref=sr_1_5?crid=18FKZSX4ITMBI&keywords=level&qid=1698707986&sprefix=level%2Caps%2C126&sr=8-5

Box cutter, $9.50, on Amazon, https://www.amazon.com/AmazonBasics-Folding-Utility-Knife-Lightweight/dp/B07TBNH4ZT/ref=sr_1_1_ffob_sspa?crid=W0GR0SH576RD&keywords=box%2Bcutter&qid=1698708040&sprefix=box%2Bcutter%2Caps%2C122&sr=8-1-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&th=1

Painter's tape ¼" wide, $8.00, on Amazon, https://www.amazon.com/DOAY-Blue-Painters-Inches-Yards/dp/B0BMM11B8L/ref=sr_1_7?crid=10FHVOCD8FV8M&keywords=1%2F4%22+masking+tape&qid=1698708098&sprefix=1%2F4+masking+tape%2Caps%2C128&sr=8-7