Keep That Bandsaw Blade Tight! Version 1.2

By R. G. Sparber

I really enjoy a good mystery when told to me by one of my machines.

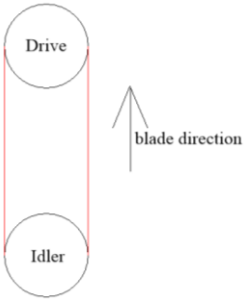
Recently I was sawing a plate of aluminum across its face.

I expected to see a straight cut edge when viewed from the top. The red arrow is the direction the blade moves.

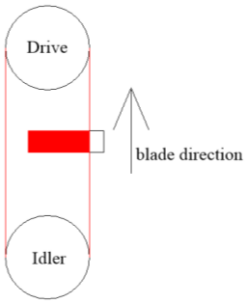
But, to my surprise, the cut edge had this shape. It was straight from about the midpoint of the stock all the way till the blade exited. Before the midpoint, the cut curved to the left. The offset where the blade entered the stock was around 0.005 inches. This is both a fun mystery and unacceptable.

My first inclination was to tighten the blade. Doing so solved the problem and left me with a nice straight cut edge.

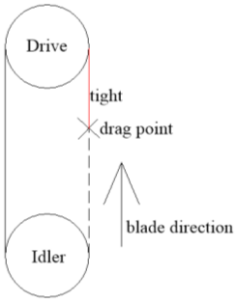
Just knowing the fix for the problem is essential but leaves far too much undiscovered. What caused this very odd shaped cut? I have a theory and trust that readers will educate me if this theory is nonsense.



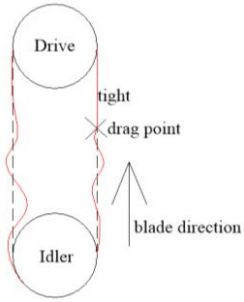
First, consider how my bandsaw works. I have a driven wheel and an idler wheel. The saw blade is pulled by the driven blade. The idler just guides the blade into the correct orientation.



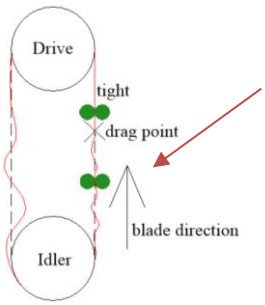
The red block is the stock being cut. Notice that the drive wheel pulls the blade through the stock.



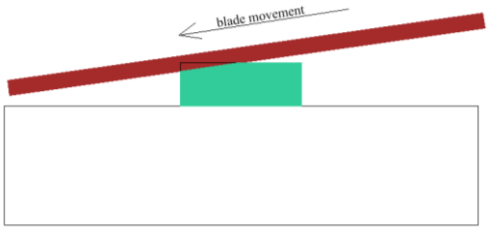
If the stock was very thin, I could identify it as a single drag point for the blade. Between this drag point and the drive wheel, the blade would be tight. If the blade had any slack, it would be from drive to idler wheels and/or from idler wheel to drag point.



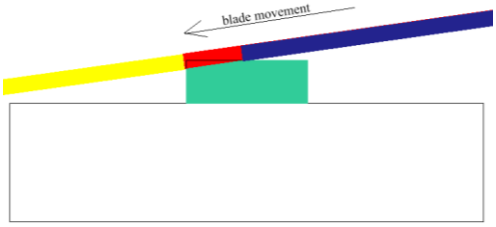
This greatly exaggerated figure shows the slack and tight saw blade. OK, hold this thought as we look at another piece of the puzzle.



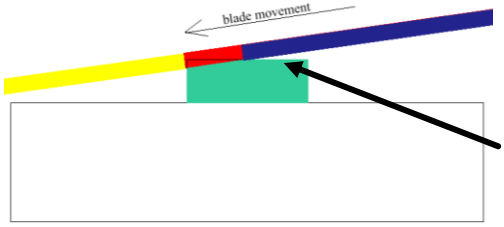
Next, add the blade guides. The guide between idler wheel and drag point would force the blade to be aligned as it passed through. If the guide was right at the drag point, there would not be room for the blade to bow. As the guide moved upstream of the drag point, there would be more room for the blade to move off track.



This is an exaggerated side view of my bandsaw in the horizontal position. The blade is being pulled by the drive wheel on the left. Since the blade pivots, the left corner of the stock is cut first.



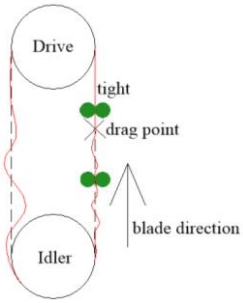
The section of the stock being cut is a drag section, in red and not a single point. The yellow part of the blade is in tension. The blue part would be slack if the blade was not tight.



With the blade above the stock, it is free to flex as needed due to slack. As material is removed from the stock, the blade will descend and start to cut in a new area. If there was flex in the blade before cutting, the cut should take on the same curve.

Once the cut has been established, the blade will follow this path because it has limited side cutting ability.

Returning to the cut I observed, the straight part of the cut is the drag area. The slack was not cutting as the blade path was being established in this area. The curved part of the cut was defined by the slack part of the blade after the drag area was well established.



Tightening the blade minimized the slack and produced a straighter cut across the entire piece of stock.

I welcome your comments and questions.

Acknowledgement

That’s to Dave Kellogg for pointing out that many of my figures were essentially upside down plus gave insight on the blade guide effect.

If you wish to be contacted each time I publish an article, email me with just "Subscribe" in the subject line. If you are on this list and have had enough, email me "Unsubscribe" in the subject line.

Rick Sparber
Rgsparber.ha@gmail.com
Rick.Sparber.org