

Autodesk Inventor – Cutting Across Sheet Metal Bends

Those of us that have designed sheet metal parts have a unique appreciation for Autodesk Inventor’s intuitive modeling tools and ability to develop accurate flat patterns from our designs. Add to this the ability to document designs in folded and/or unfolded states, as well as automatically adding process-centric Bend Tables and annotations, and we have a robust design-to-manufacturing tool that only gets stronger with every release. In this whitepaper we discuss two methods to cut across sheet metal bends easily and accurately.

Cutting Across Sheet Metal Bends – Case 1

In this case we’ll start with a simple part consisting of two features – a 3” x 2” Face and a 2” Flange placed along one side using the Centered option.

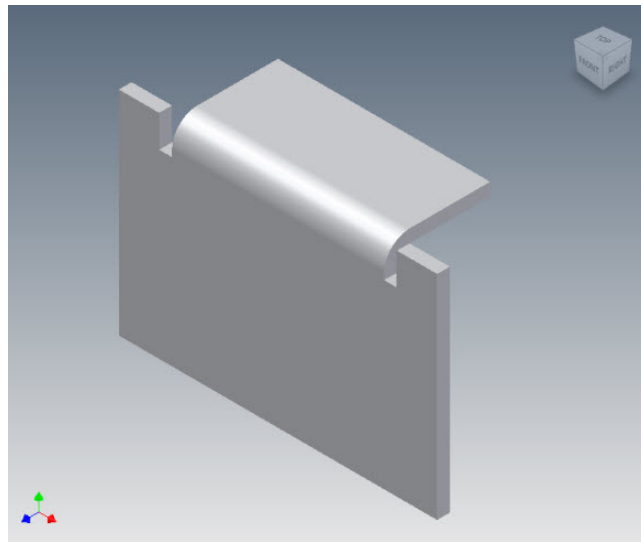


Figure 1

Next, we’ll place a sketch of our desired shape on the bottom face of the part, and fully constrain it as shown in Figure 2. Note the dimensioning scheme used to determine the overall length of the slot.

After completing the sketch, start the “Cut” command.

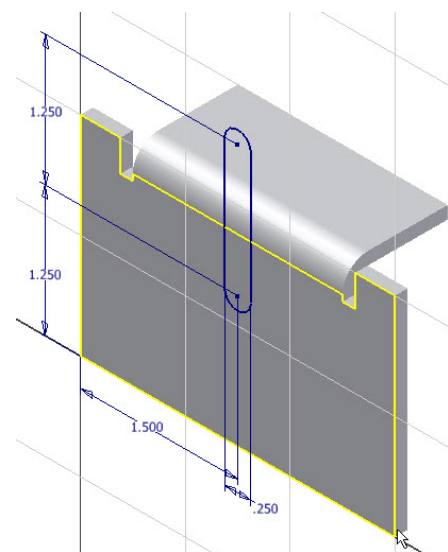
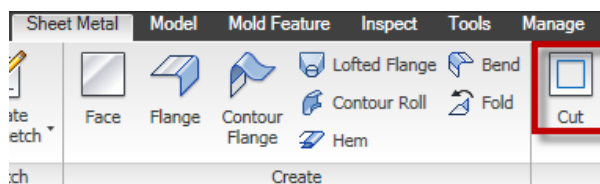


Figure 2

Select the profile and additionally select the “Cut Across Bend” option as shown in Figure 3. This cancels the extents option and just allows a Thickness amount which can be varied for the depth of the cut.

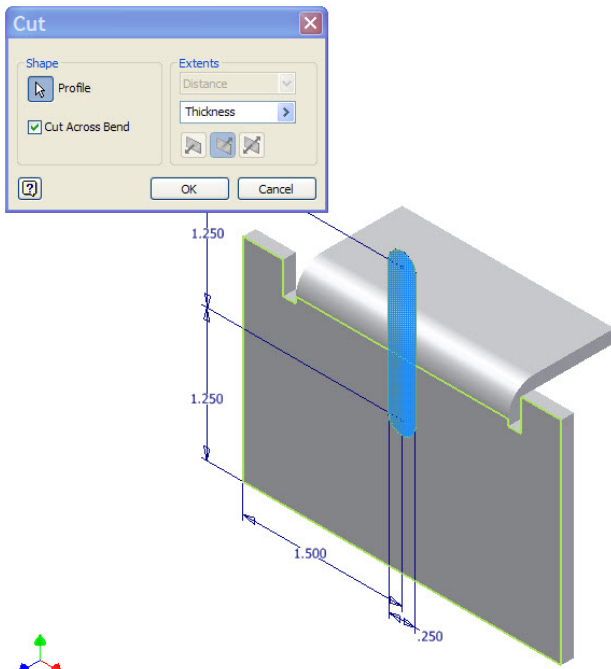


Figure 3

Our result is shown in the following illustration.

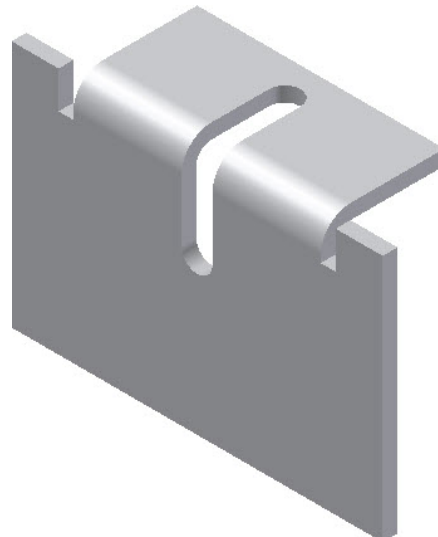


Figure 4

Cutting Across Sheet Metal Bends – Case 2

In our last case we based the length of the slot relative to other features in the same sketch plane. What if, in fact, our desire was to control it based on a relationship to a feature elsewhere in the model, such as the top edge of the flange? The answer may not be readily obvious, but Inventor affords us the ability to calculate and project flat pattern geometry into the current sketch.

At some point during the initial sketch creation, find the “Project Flat Pattern” command under the “Project Geometry” pulldown menu (Figure 5)...

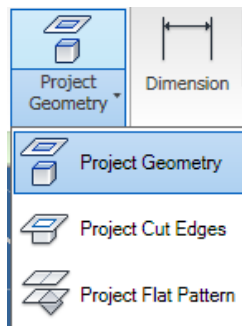


Figure 5

...and select the face of the flange as shown in Figure 6.

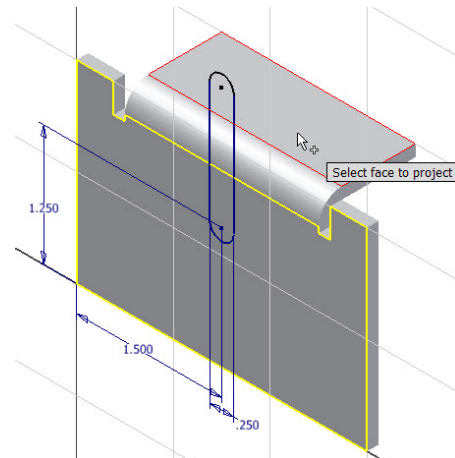


Figure 6

This will result in the calculation and projection of the flange geometry into the current sketch (Figure 7) and will allow for a dimensioning scheme that better captures our design intent (Figure 8).

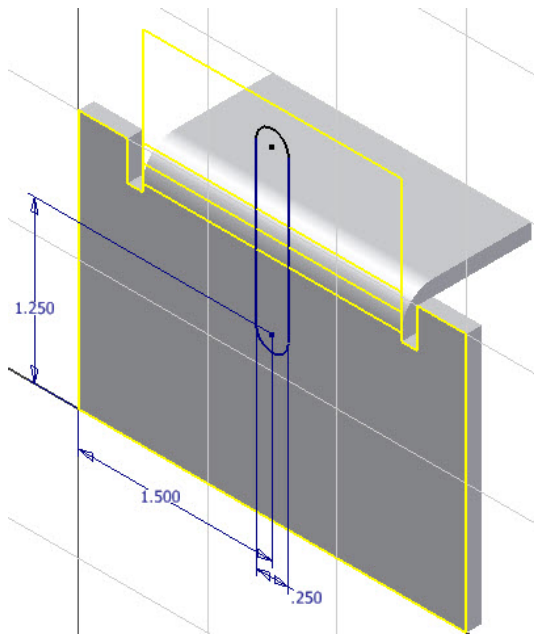


Figure 7

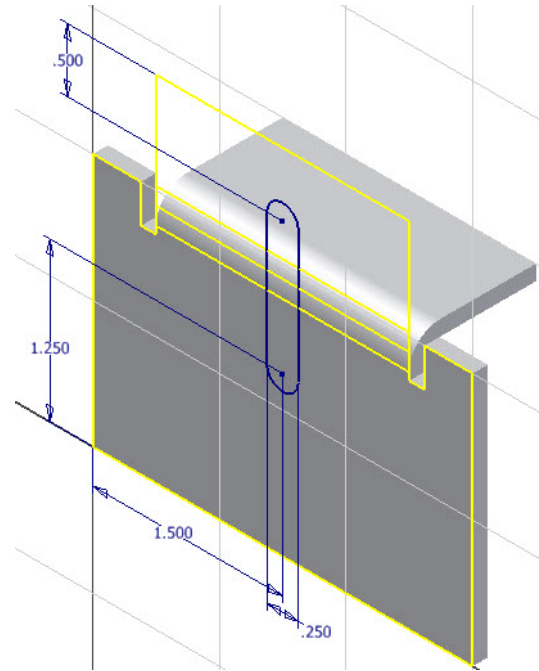


Figure 8

About the Author: Sam Hochberg

Sam comes from a manufacturing and design background, and has been using 3D CAD modelers as a Product Designer since 1981. While working at Motorola in the mid-80's, he was tasked with devising and instituting an in-house CAD training program, and also became involved in application support. He has also taught CAD part- and full-time at the collegiate level, and has worked as an Application Engineer at Computervision, PTC, and Autodesk resellers since 1987. He brings this combination of experience into his current pre- and post-sales support position, and in training customers believes in not just showing "how" but explaining "why."

- ATC Certified Instructor
- Inventor Certified Expert
- Manufacturing Solutions Implementation Certified Expert
- AutoCAD and AutoCAD Mechanical PSE Certified



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