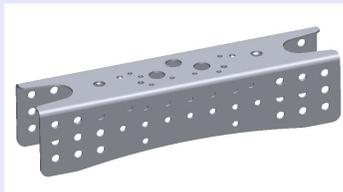


Bent Out of Shape

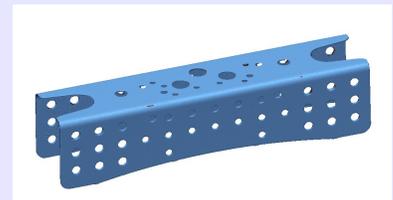
Background

One of the most valuable applications of 3D scanning is to perform 3D inspections on manufactured parts. A 3D scan allows you to make critical measurements between key features, just like traditional measuring tools, and can also provide a more complete picture of the shape of a part. This helps to how manufacturing processes impact the final shape, and helps identify potential problems before they become expensive problems.

Our Process

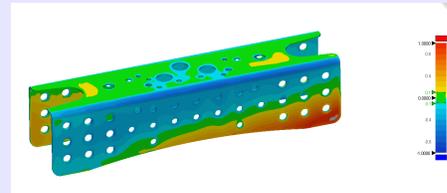


We were asked to scan a set of stamped steel structural components, to see if the manufacturing processes in place met the expected accuracy defined by the designers. The samples parts were first oriented in a custom fixture, to ensure

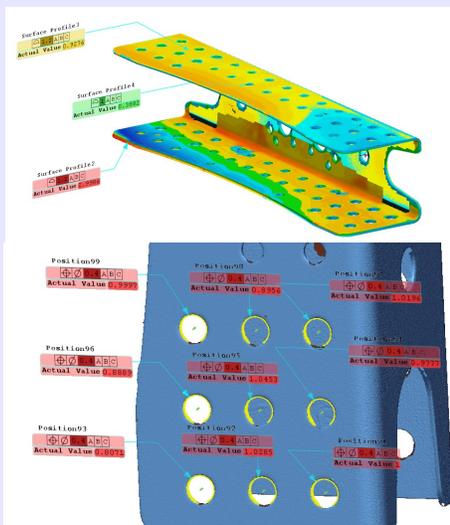


that the scans were consistent and captured all of the critical areas. The entire part was captured, with special attention to the edges of the holes and the exterior surfaces.

Using the original 3D CAD data as a reference, we then positioned the 3D scanned samples using the datum alignment defined on the drawing, and were able to make a quick inspection of the overall surface. What was immediately apparent was that the part had a slight warp along the vertical walls, likely resulting from residual stresses created during the forming and piercing process.



The Results



The residual warp had a small but significant impact on the overall part. We were able to generate a full GD&T inspection report to measure the true position of all 36 mounting holes. Even though the holes were accurately placed along the side walls, the fact that the walls were out of position meant that the majority of the holes failed to meet the intended design tolerance.

This type of information allows the engineer responsible to understand just what is achievable with normal manufacturing methods, and understand how parts come to their final shape. Understanding a problem is the first step to solving it, and a 3D scan is the easiest way to understand complex 3D geometry.