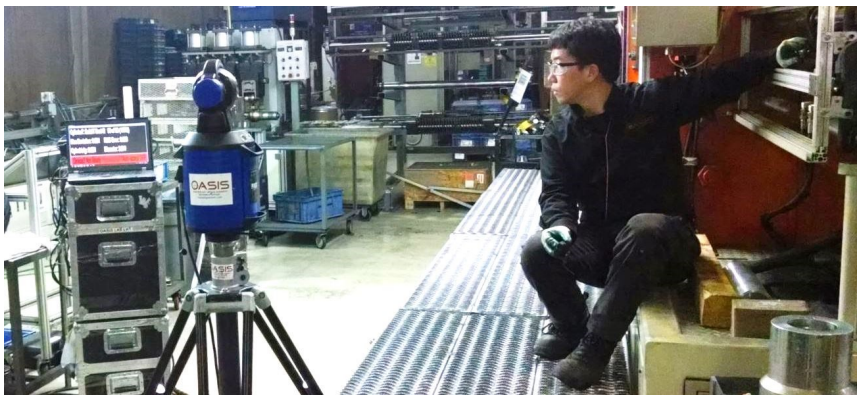
OASIS
3D METROLOGY ▾ OPTICAL ALIGNMENT
MECHANICAL SERVICES

**American BOA**
**Success Story**



## The Challenge: Unable to Meet Quality Standards

Brandon Clifton, Manufacturing Engineer in the Automotive Division of American BOA in Cumming, GA contacted OASIS when one of their hydroforming machines would not produce straight parts. Clifton and his team were unsure what area of the machine was out of alignment, but could clearly see that the parts produced did not meet their straightness quality standards.

The American BOA location in Cumming specializes in manufacturing flexible, corrugated steel pipes for automobiles and other forms of transportation. These particular pipes are used to connect a car's engine to the exhaust pipe.

The hydroforming process to produce the corrugated steel pipes involves loading raw tube into the hydroforming dies and using hydraulic pressure to expand the tube to the desired shape of the die. A problem arose when the spring shape was not straight coming off of this particular machine. Clifton called in OASIS to inspect this machine and two others that were having possible alignment issues.

## Alignment Services Needed: OASIS Called In

The OASIS service center in Charlotte, NC received the initial call. George LeGrand, Southeast Account Manager, met with Clifton at his facility. After providing an initial inspection of the machines, LeGrand suggested having an OASIS metrology engineer complete an in-depth inspection of the first machine using a laser tracker. Due to production volumes in their facility, Clifton needed someone immediately. Li Guan, OASIS Metrology Engineer was first available, and flew to GA from the OASIS Service Center in Montreal, QC.

*"What I got was so much more than I expected"*

First, Guan visually inspected the machine for two things: how it functions, and where the inspections needed to occur. Additionally, he observed the process the machine goes through to actually make a part. He then determined what the most important components of the machine are, and where the most important inspections needed to be performed. "[Li] inspected every part that we had discussed", says Clifton, "and then built a model of the machine with the metrology software. The model showed both an out-of-level condition of the machine, as well as misalignment of its cylinders."

The laser tracker that Guan used for the inspection takes points in 3D space, and then, using these points, the software creates a model of the machine and verifies its center. "The 3D Metrology tools enable us to see things we cannot see with the naked eye", says Guan.

By using the laser tracker, Guan was able to build the model as he inspected the machine. The advantage to this is that it eliminates steps that would otherwise be required, such as reviewing blueprints and inputting that information into the computer in order to create the model. Additionally, because the model was created on site, he was able to immediately confer with Clifton. Clifton was impressed with Guan's tactics from here. "What [Li] did next was immediately indicative of his expertise with this piece of equipment. First we leveled the machine, and then Li worked with my tech to move the machine to several different positions, plotting a curve of the machine's movements, which allowed us to determine the root cause of the problem."

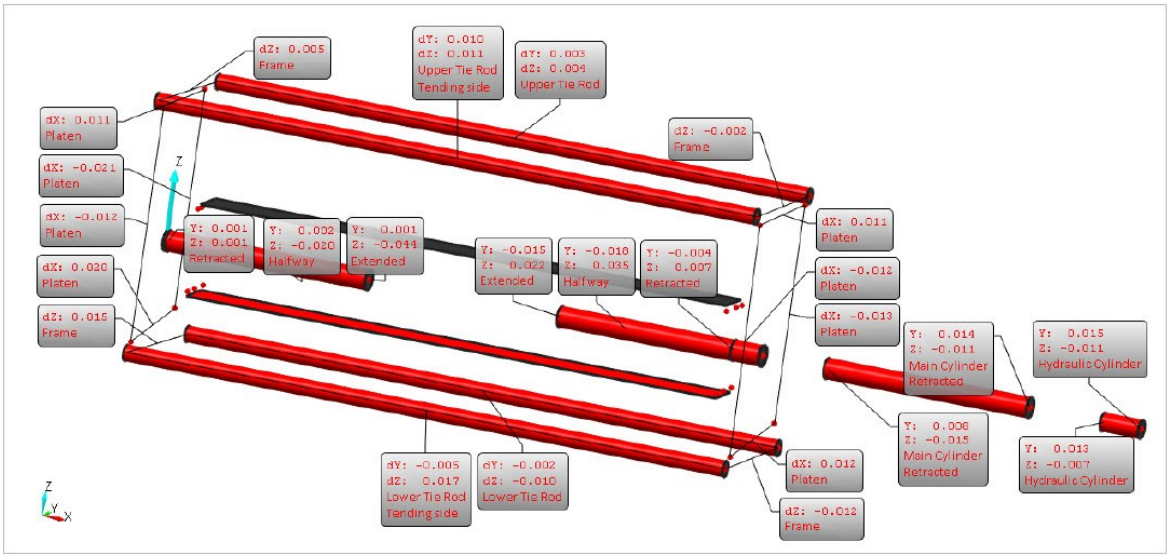



*Image shows data captured by laser tracker and displayed in real-time using 3D software*

Clifton comments, "He even named the machine components with logical names that would make it very easy for anyone reading his report to associate the parts of the machine with his readings."

"After all measurements were taken, he worked with us using the machine's adjustment bolts and we were able to take out nearly all of the misalignment," remarks Clifton. So much so, that the scope of the project could be expanded. What started as an alignment project on one machine turned out to be for three machines. Guan's quick success with the machines allowed for the scope of the project to expand beyond what was originally thought possible in this two-day project timeline. Clifton continues, "By the third machine we were ready to compare some parts. [Li] took some of the production parts, found our quality lab, and with our optical comparator he measured the angular and lateral offset of parts from four different machines in our facility, noting the results of each inspection. Then he went back out and worked with us to align yet *ANOTHER* machine (#3) and get its parts perfected."

***"I can't even express in words how impressed I am with Li . . .he made suggestions to me and my staff, explained step-by-step what he was doing and how it worked, and ultimately got our machines back up and running like never before. . ."***