

WHAT IT TAKES TO WIN THE MANUFACTURING RACE

**OHIO MANUFACTURER, NAPOLEON MACHINERY DRIVES THEIR SHOP TO SUCCESS
WITH TOYODA'S LARGEST AMERICAN BRIDGE MILL**

It takes all but few, but powerful victories for a NASCAR team to make it to the top – all which owe their success to efficiency. During the off season, teams work tirelessly to build engines, train drivers, and review aerodynamics of the car's structure for the final track test runs. Repeatability, accuracy and evolution of capabilities are not only what it takes to win in NASCAR. Turning a once vacant shop into a top notch large part machine shop such as Napoleon Machine in Napoleon, Ohio must achieve all this and more.

Napoleon Machine follows the NASCAR business model for success. President, Kevin Febrey serving as crew chief, combined with his pit crew- 22 employees- work together to build and keep their car – business – running to the winner's slot. You need the right car, the right crew, the right gas. Literally every aspect, every function needs to be compatible and working in top shape. For Napoleon, it is having the right software, operator, fixture and tools.

Maintaining a hefty line-up of 14 large capability machines comes at cost both monetarily and per timing. Napoleon Machine has had an exceptionally large feat to overcome in just over five years to not only maintain a winning large part producing shop – they had to rebuild it from scratch. Through perseverance, the team won new customers, allowing for new investments, more booked projects and ultimately the ability to purchase a Toyoda LB63324M Vertical Bridge Mill – their first new machine since 1996. With an increase in quoted projects from 6 percent to an outstanding 52 percent, there is no doubt a little grease, off track preparation and the industry's most robust bridge mill, Napoleon has seeded themselves at the top each week.

The 65,000 sq. ft. facility in Napoleon, Ohio had sat for years unused; still filled with numerous rusted boring mills and manual lathes. It wasn't until Paul Schlatter caught a glimpse of the large part machining potential possessed under the dusted equipment and began reviving the shop. Schlatter established Napoleon Machine in February 2010 after



Napoleon Machinery's Toyoda LB63324M Bridge Mill in their 65,000 sq. ft. facility.



leasing the facility and its 13 large part machines that came along for the ride, none of which had been updated since 1996 – posing a major obstacle to getting started in the fast-paced manufacturing race.

Schlatter needed to assemble a team with capabilities to transform the shop back into a serious competitor. With this in mind, he brought on someone he knew could drive change. Current President Owner, Keven Febrey began leading shop floor operations and strategic planning in May 2011. Febrey's career in the manufacturing industry started at a small job shop in Rochester, New York at the age of 16. After graduating from technical school, Febrey took his passion to a new level as he received his MBA from the University of Toledo and was named General Manager of Jerl Machine, Inc. 10 years of manufacturing management under his belt, Kevin Febrey was ready to begin his new journey situated as the Crew Chief of a team needing some major rebuilding.

"There really was no infrastructure. We needed to put a business system in place, get professional management, obtain a maintenance person to revitalize the equipment, establish quality machining and build a new customer base," Febrey explains. "The biggest hurdle was the equipment itself, so we had a slow start."

From the beginning, Napoleon Machine has had a unique opportunity of potential manufacturing success in terms of having a large facility with large parts capability for machining and fabrication. It was Febrey's task now to build a quality team on all facets that would bring Napoleon to take lead in the large part race.

With a new business structure in place, Napoleon Machine's next step was to hit the shop and get their "car" running efficiently enough where older equipment could be relied on until bigger investments were made. Most impressive, Napoleon incorporated a Bluco modular weld system to their shop, increasing accurate set up times and a higher quality product. Utilizing modular fixture systems, work coordinates are secured in both weld and machining operations for the best reproducible and repeatable parts throughout the industry. The team then custom designed riser blocks with the ability to be located on cross keys on their module sub-tables. Made to maximize flexibility during setups while adding an element of speed and accuracy with the precision cross keys, Napoleon fabricated, stress relieved and machined these risers in four varied heights.

In Napoleon's next play towards the winners circle came their Faro Laser Tracker, validating dimensional integrity by having the capability probe outputs right off the machine. Simplifying the inspection process where operators are responsible for their own work and validation. As an ISO 9001 2008 certified company, the team stands by William Foster's philosophy of,

"Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives."

New technology was in the near future after having built quality into the process and establishing a system for reliably and repeatable accurate machining utilizing specially made risers and internal quality control. Febrey was ready to make the next move, he had already eliminated the “links in the chain” as he calls it, and was set to achieve positive ROI with Napoleon’s first new machine since 1996 – the Toyoda LB63324M Vertical Bridge Mill.

“Our whole goal, still, is not only to get us more competitive with technology in terms of five sided machining, a tool magazine, through the spindle coolant, faster speeds and feeds, featuring and tooling.” Febrey went on, “It was also to begin a transition in the type of work or the mix of work we can do.”

Advanced machining capabilities would not only bring Napoleon Machine into the 21st century, but ultimately lay the foundation for a more competitive shop. In August of 2015, Napoleon began machining for customers on their new Toyoda LB63324M Vertical Bridge Mill – the largest Toyoda work envelope in the United States – specializing in casting, mold platens, die platens and OEM machine components.

Febrey hit a realization about 80 percent of the work Napoleon completed was not boring mill work – and they were predominantly, a boring mill shop. They had functioned without coolant through spindle, an automatic tool changer, speeds and feeds. One of Febrey’s main concern for the investment of a boring mill was choosing one that fights the lengthy set up of four to eight hours that comes with large part machining.

After having visited Toyoda’s headquarters in Arlington Heights, Illinois, Febrey knew the vertical bridge with a right angle head was the way to go to knock out set up times and increase his shop’s capabilities. Two weeks after installation, the machine packed with a 60 automatic tool changer, through tool coolant, modular fixture and a right angle head proved to amp up productivity and attraction from new customers.

“We hit the road running. The Toyoda made solid impact on our shop floor, seeing drastic improvements in cycle times,” Febrey said, “alongside having a minimal learning curve and putting on very good accessories from tooling and set up.”

The addition of a right angle head for 5 axis machining played a major role in significant reduction of set up time and machining capabilities. One of the simple return on investments of this machine is its ability to run repeat parts and processes, improving overall cash flow and allowing operations to be run around the clock. Febrey’s initial goal for the Toyoda Bridge Mill was to achieve 3 shifts by May 2016 – they succeeded and saw the result by March 2016. Maintaining accurate machining geometry reduces the number of set up per process, ultimately reducing the potential for accuracy error and achieving the perfect part.

“With the right angle head capability, we can now get to five sides of a square part – where you have six sides – in one set up.” Febrey went on to say, “We are able to maintain square-ness and parallelism a lot tighter than we would by picking up the part, changing the setup, rotating and indicating.”

Fit for massive loads up to 45,000 lbs, Febrey then equipped the Toyoda LB63324M with Haimer USA shrink fit tooling, Tecnomagente work holding magnets and a modular fixture system where sub tables increased repeatability along with reducing set up costs. Machining is a process – any weak links in the chain create issues. From a racing standpoint, Napoleon

President, Kevin Febrey, shows off their full Haimer Shrink Fit station. Including the whole system just steps from Toyoda’s Bridge Mill allows for efficiency and quality at the fingertips whenever needed.



Custom designed riser blocks with the ability to be located on cross keys of Napoleon’s modular sub-tables. The shop fabricated, stress relieved and machined to specs the blocks in house.



was making good use of their long lead times during “off season” in prep for the big race: winning large part machining projects for top tier customers.

Historically, Napoleon saw 6% to 14% hit ratio of quoted work for large part projects that has now increased to near 50% due to the LB63324M. Toyoda’s Vertical Bridge Mill has completely blown Febrey’s predictions out of the water. A variety of jobs working with platens, bolsters and die risers made from either cast iron or A36 plate, Napoleon has witnessed drastic reductions in cycle times where they have comparisons from their older boring mills to that of the Bridge Mill. In the most radical case they went from running 224 hours to 105 hours. Other numbers continue to be astounding: a 136 hour process was cut to 59 hours, 115 hours down to 60, 203 hours – now only 110. In total, Napoleon’s Toyoda LB63324M has attributed to a whopping average of 49 percent decrease in run time per machined component with these types of parts.

“We are winning 52 percent of the work quoted on our Toyoda Bridge Mill,” Febrey exclaimed. “We’ve even begun breaking into large part aerospace component machining as a second tier manufacturer.”

Shortly after the Bridge Mill addition, Napoleon was approached by Nelson Trailer to work on two separate projects as a second tier manufacturer for Lockheed Martin and Northrup Grummond. Napoleon cut components used as an upender assembly unit on Weldox 700, a tougher material with lower surface footages than they had been used to. The unit was used for assembly and testing of satellites that were then welded and assembled by Nelson Trailer. Components would mary-on the upender machine for 12 to 18 months as it went through temperature fluxation testing to simulate space.

“It was a pretty cool concept we were involved in,” Febrey said. “We used our boring mills and the Toyoda LB63324M bridge mill with 60 percent of the work due to the right angle head, making parts more accurate and efficient.”

If there is one thing Napoleon brings to the table other than their machining capabilities, its integrity. They not only have evolved machining capabilities on their floor, but having started from scratch, Napoleon Machine’s commitment in taking the time to visit customers with 250 miles and invest in their interest speaks for itself. There is no question this is just the tip of the iceberg for Napoleon Machine. It is clear, with Toyoda’s Vertical Bridge Mill leading the floor with 52 percent of won projects in just one year, Napoleon is being put on the map.

“It is (Toyoda’s LB63324M) putting us on the path that will help us grow, be more competitive and really provide a high end product,” Febrey stated. “Customers know they can not only trust us with integrity, but they are going to get good, accurate, functioning products on time.”

Over the next two years, the shop expects to see a continuous increase in large component work won and with that, the addition of a second Toyoda Bridge Mill. They have already discussed industry needs and begun putting together an internal strategy to begin testing the waters and go after work they once thought was unattainable.

Napoleon put their top CNC Machinist, Chris Behnfeldt on the new Toyoda, with over 20 years of expertise. As a process engineer, Chris selects the tools makes setups and programs to keep the machine running.

