

# Touchdown Machining Tackles Hefty Turning Challenges

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Mike Moore, Touchdown Machining, Inc.



(l-r) Sam Wilcoxon, VP, and Mike Moore, President, Touchdown Machining Inc., with a finished roll body, ready for inspection, on the Kingston CK 3000.

Shorter lead times and improvement to quality are ongoing goals for all manufacturers, but for Touchdown Machining, Inc. recent challenges also included new production processes and component design requirements.

Substantially larger machining equipment was needed to manufacture sizable products such as stub shafts and metering rolls (conveyor components) for the food processing industry. Materials to be machined included 304 stainless steel and 17-4 stainless steel.

One component the company manufactures is comprised of two stub shafts and a roll body. These stub shafts are made of 304 stainless steel, weigh 1,500 lbs in rough state and require machining from 12” down

to 3” where a bearing journal will be located. The roll bodies are machined from 17-4 stainless steel, weigh 2,000 lbs in rough state and measure 16-1/4” diameter and 48” in length. They are cast with a 10-1/2” hole, which requires 8” of ID boring to be able to accept the stub shaft during assembly. The parts are shrink fit with liquid nitrogen during assembly, with .008” interference between the roll body and stub shaft.

“Such components require a highly precise CNC machine that is capable of turning large-scale parts,” said Mike Moore, President, Touchdown Machining. “A completed component could weigh from 3,000 to 4,000 pounds.”

*[cont. on reverse]*

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While the current manual equipment provided sufficient capabilities for the company's present jobs, there were difficulties and limitations that needed to be overcome. These included time issues such as setup and tool change, as well as the constant need for dedicated, experienced operators to ensure consistent part quality. In order to overcome these challenges and at the same time grow their capabilities, Touchdown Machining turned to CNC machines.



Kingston CK 3000 CNC lathe set up with a roll body ready for machining.

Touchdown Machining owners Mike Moore and Sam Wilcoxon began their search for the ideal machine tool, and found the solution at an IMTS show in Chicago, IL. Their selection was a Kingston CK 3000 CNC lathe. Weighing in at 29,000 lbs, the CK 3000 features maximum cutting length of 126", cutting diameter of 20-1/4" over the saddle and 12-1/2" thru bore, spindle speeds of 10-400 RPM and main drive motor power of 40 HP.

"The first reason we chose the Kingston CK 3000 was because it had the best price for the quality,

performance and specifications it provided," said Mike Moore. The second reason was the fact that they were already acquainted with Kingston's manual lathes. "We have had our Kingston HR 4000 manual lathe for seven years, and it is a well-built and highly reliable machine," said Mr. Moore. So well-built, in fact, that their HR 4000 has never needed replacement parts.

The heavy-duty Kingston HR 4000 manual lathe features spindle speeds of 8-800 RPM and 20 HP main drive motor power and 30" x 16' capacity. Both the manual and CNC lathes offer versatility and are able to handle the turning requirements of larger scale components.

With the Kingston CK 3000 CNC lathe, Touchdown Machining has reported significant enhancements in surface finish, quality and productivity. "We run through 12 stub shafts within a five-day period, producing about 8,000 pounds of stainless steel chips with the CK 3000," said Sam Wilcoxon. According to the company, advantages include shorter load up/change time; ability to cut complicated features via computer programming; quicker setup time; automation allows for use by less experienced operators; consistently close tolerances and high repeatability.

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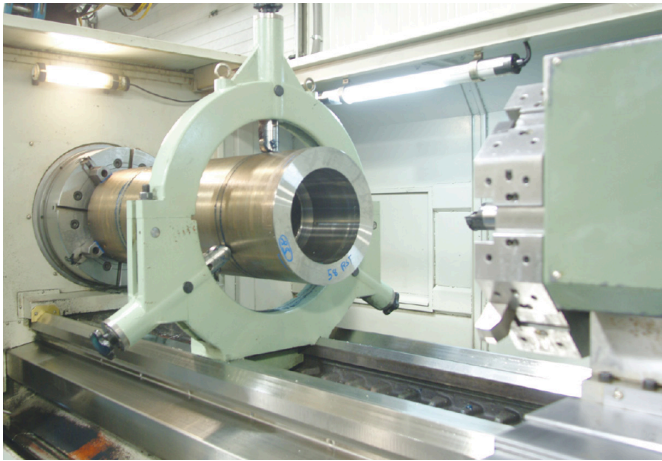
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The CK 3000 not only improved current production but also brought in new business as well. One job requires machining an inertia drum for a dynamometer (a device used to measure power and torque), and the CK 3000 provides .350" depth of cut per side. According to Sam Wilcoxon, the enhanced machining capabilities have improved processes as well as provided them with quicker turn-around, which in turn is helping them to continue building a solid reputation with a growing customer base.



A 17-4 stainless steel roll body that is finish machined and ready to shrink fit to the 304 stainless steel stub shafts at the customer's facility. The stub shaft is first submerged in liquid nitrogen and then dropped into the roll body for a tight fit, .008" interference between the roll body and stub shaft.



After machining, Mike Moore inspects the ID dimensions of a roll body with a FARO Gage. There is ample room inside the Kingston CK 3000 for inspection with the portable CMM arm while the workpiece remains on the machine.

Touchdown Machining is located in Columbus, IN, 3,000 sq. ft. of space is dedicated to CNC machining and features both CNC lathes and CNC mills. The 9001:2008 certified company has a wide range of chins including manual mills and lathes, EDMs and grinders, as well as a CMM for quality control, and 3D design capabilities along with reverse engineering. Industries served include automotive, food processing, printing, military, aerospace and drilling.

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