



Application Story: Prince Industries / Toolmex

MANUALTURN LATHE ALLOWS OPERATORS TO “LEARN AS THEY GO” WITH PROGRESSIVE AUTOMATION

At Prince Industries in Livonia, Michigan, a unique blend of prototype and production work keeps this 30,000-sq. ft. job shop very busy. Their customers include a variety of tool and diemakers, aircraft component suppliers, heavy construction equipment builders, energy producers and steel foundries. The shop houses an assortment of milling, turning and grinding machinery of all types, from manual to full CNC. A majority of the jobs here involve shaft, ID and chucker work, usually in print-to-prototype and small quantity runs. Predictably, the greatest challenge Prince Industries faces, according to owner Harold Eklund, is the programming and set-up time on the machines. Founded in 1978, this company has met this challenge in various ways, over the years. In general, the choice always came down to manual vs. CNC machine tools, depending on the anticipated work load and job quantity mixes.

Then, something happened to change that paradigm at Prince. Eklund saw the Haco TUR630MN with a Siemens SINUMERIK 810D CNC and ManualTurn software onboard from Toolmex Machinery in Schaumburg, Illinois. The proverbial light bulb went off when he discovered this machine had the ability to run not only in a manual mode, helpful when his operators needed to program from a print directly into the controller, but also the ManualTurn software would allow a “learn as you go” function for his operators, especially those without extensive G-code knowledge.

As he explains, “This is the easiest control to program in our shop. Training new employees is especially easy, fast and simple. We don’t need to use a computer for G-code programming, so we can get to a finished part much faster, without any loss of accuracy or part quality. By compressing that time function,

we’ve improved our profitability on a lot more jobs. Personally, I also like the excellent threading control on the machine,” Eklund observed.

The first part on the TUR630MN is done in a teach-in manual mode, then the CNC supports the elementary contours, stock removal mode and cycle modes of thread, cut, groove, undercut, drill and thread repair. The machine offers a step chain programming function, EASYSSTEP, which allows a simple assignment of graphic symbols to the graphic elements and block commands. Up to 50 undefined elements can be calculated through the onboard contour calculator with contour handwheel. Online simulation is said to be faster with more reliable checking of parametric values.

Above: TUR630MN with 80” between centers, a manual turn, long TRI-V bed, CNC lathe, currently used at Prince Industries for prototype and short run work.

Below: Siemens SINUMERIK 810D, a 32-bit CNC, mounted on slide to move over the entire working length of the machine bed. With ManualTurn software onboard, the operators are able to “learn as they go” through the programming cycle. Best of all, the CNC does likewise!





The machine is capable of handling a max. 4,400-lb. workpiece between centers with a 25" swing and a 4.1" spindle bore with dual spindle nose. Equipped with high-precision brushless motors and drives, the TUR630MN provides Prince another distinct advantage Harold Eklund and his team appreciate. Namely, the machine's control panel moves along the entire length of the work bed. While it may seem a detail, this feature allows an operator complete access to the controls while inspecting even the largest workpiece. It's one more time saver and, as Eklund observes, "all these improvements make a big impact on our bottom line."

Prince Industries processes all types of materials on the machine, from various tool steels to aluminum and Waspalloy. End uses for the parts produced here include anchor components for U.S. Naval vessels, ballscrews for military aircraft, forging dies, prototype tooling and massive, one-of-a-kind construction equipment sections.

Used primarily for axis movement and spindle control on this manual turn lathe, the CNC onboard has been very reliable, according to Harold Eklund. He related his only service problem to date, in this way, "We burned out a main board and called for service. Siemens discussed the problem with us over the phone to diagnose the situation, then they sent someone out from their Chicago office with

the proper parts and our machine was up and running the very next day."

While no specific time-motion study has been done, Harold Eklund estimates the use of this "learn as you go" progressive automation lathe has resulted in at least a 10% decrease in the time-to-part for many of the jobs at Prince Industries. He also observed the Siemens control and ManualTurn software allowed him to keep his same skilled operators running the machine at the improved productivity level.

Tom Kob, division manager for Toolmex, echoes this idea. "This machine fills a void for companies such as Prince, who routinely run prototypes and short quantity jobs. The CNC here doesn't require knowledge of G-code programming and therefore a lot of very skilled manual machine operators can remain at work and get much more accomplished. The reduction in time-to-part is indeed substantial and the operator can progress into the CNC mode in stages. It's been a very successful machine for us, precisely because it makes such a noticeable difference for companies such as Prince."

The Siemens SINUMERIK 810D is a compact CNC for drilling, milling and turning applications and features full integration with the company's SIMODRIVE 611 digital drive package. It is said to be an ideal control for cost-optimized machine tools. ■

Above Left and Right: Typical parts produced by Prince Industries for its customers in the tool and die, aircraft, heavy construction equipment, energy and foundry industries. Shown here are 20" dia. aluminum motorcycle wheels and 5" dia. X 56" landing gear components.

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