Five Things You MUST Know About Manual Machine Tools
Pick anything in any room and we will tell you how it came from a machine shop.
Manual Machine Tools

CNC vs. Manual

Performance

Service

Training

Safety
The veteran toolmaker issued the challenge in the barely used conference room with a worn table and several threadbare chairs. *Pick anything in this room and I’ll tell you how it came from a machine shop.*

What about the lonely plastic cup on the desk in the corner? Surely, something that belonged more at a college kegger was removed from the long tentacles of a machine shop ...?

The plastic mold to produce the cup comes from a mold maker, a related but more specialized branch of machinists along with tool and die makers and gauge makers, explained Michael Shadel, Tool & Gauge Maker from Pace Machine & Tool in Jupiter, Florida.

Ok....check!

**Computer Monitor Challenge**

What about discarded computer monitor on the desk that looks like it hasn’t been used since the days when images on computer displays were a ghostly, green tint? The circuit board in the back of the monitor came from a die that stamps out metal. The resulting parts had to be checked rigorously by a gauge maker to ensure accuracy and precision, argued Shadel.

Check.

Shadel leaned back in his chair with a confident smile on his face before getting a tad rueful. "You can’t have anything without us, but everybody is trying to phase us out," he added.

So manual machine tools are still needed as is knowledge about them. This paper intends to drop some knowledge about these indispensable machines. So without further ado, here are **5 Things You MUST Know About Manual Machine Tools!**
FIVE THINGS YOU MUST KNOW ABOUT MANUAL MACHINE TOOLS
1. CNC vs. Manual

Manual machine tools may be moving to the back of the machine shop by newer, flashier, computer-operated CNC (computer numerical control) equipment, but they will always have a place in the world of machining.

CNC machines are still the industry standard used for big production runs that require automation. But smaller runs require the use and knowledge of manual machine tools. “There’s a lot of things you would prefer to do manually,” says Ken Smith, Buyer for LeBlond Ltd, a Cincinnati-based supplier of manual machine tools and parts.

“If I am ordering a part from one of my vendors, and it’s a one-sie or two-sie, the chances are that is not going to go on a CNC machine. The setup time makes it cost-prohibitive. I can send that job over to a vendor, and he can do it on a manual equipment more efficiently than he can on a CNC-type machine.”
2. Performance

Your manual machine tools must perform. Your lathe, grinder or drill must be accurate and precise.

“On a lathe, you want to know that it has a real, good level and square, true running ways,” says Shadel of Pace Machine & Tool, Inc. “On a surface grinder, you want to make sure that you have a good, magnetic chuck and you also want to make sure that the ways are smooth and accurate. If the ways are off, the diameter of the part you are manufacturing is going to be off.”

LeBlond’s Smith suggests that operator can feel an imprecise machine. “With a lathe, if a guy is turning the shafts and it gets to where he is seeing a taper, something is running out. Something is out of alignment.”

Often, a skilled machine operator can compensate for the wear of a machine. “If you have a defective part and you eliminate operator error, that pretty much points back to a problem with the machine,” Smith adds. A machinist can ensure accuracy by checking parts with quality control inspection tools such as micrometers, dial indicators, hoke gauge blocks and ring gauges.

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Using quality control inspection tools such as a micrometer ensures a machine’s precision.
At a larger machine shop or manufacturing center, there will be a stand-alone quality control inspection department. At smaller shops, usually the most senior operator does the inspection work.

If you are thinking of purchasing a manual machine tool, it is important to go with a company that supplies parts that have been through a rigorous inspection process. The machine tool company LeBlond Ltd. has been in business since 1997.

The original LeBlond company was founded in 1887 by R.K. LeBlond. LeBlond Ltd. is in the lineage of the original LeBlond company. The inspection process at LeBlond Ltd. is built into all the parts it supplies.

“If we send a part out and a customer has a complaint, we can do some of the primary checks here,” says Smith. “It’s our job here to use tolerance and gauging equipment to verify that the part we sold to the customer are correct.”
3. Service

Just as you want to go with a company that inspects its parts, you also want to choose a company that still has parts available and can service your equipment whether it’s a lathe, grinder, milling machine, drill press or any other manual machine tool.

As CNC equipment becomes more prevalent, the number of manual machine tool companies shrink.

“If you have an older machine that was built in the 1950’s or ‘60’s and you need a part for it, that tool company has been out-of-business for years and you probably couldn’t find any parts for it,” remarks Shadel of Pace Machine & Tool.

That is not the case with LeBlond Ltd., supplier of parts and service for LeBlond and Standard Modern lathes, K.O. Lee grinders, Deka Drills, Johnson Presses and W.F. & John Barnes equipment. The LeBlond company has been in business for over 100 years and supplies parts for many of its products.

LeBlond Ltd. is based in Cincinnati and has over 120,000 parts valued at $1.2 million for LeBlond lathes and the newer RKL series. You can find parts for machines dating back as far as the 1940’s.

Regarding the K.O. Lee products, LeBlond Ltd. supplies OEM parts for cutter grinders and surface grinders. LeBlond stocks over 105,000 of these parts dating back to the 1970’s. The parts are valued at just under $1 million.

Rest assured if you buy a LeBlond lathe, K.O. Lee grinder or any of the LeBlond family of manual machine tools, you would have access to parts dating back as far as the World War II era.

“If I was going to buy a machine, I would want to know you could get service for it,” says John Cook, Customer Service Representative for LeBlond Ltd.

LeBlond offers service for its lathes and K.O. Lee grinders thru a partnership with Willenborg Associates. The company offers on-site repair services and can rebuild, repair or retrofit a LeBlond lathe or K.O. Lee grinder.

LeBlond Ltd. also offers technical assistance over the phone. The company prides itself on the experience of its seven-member team with a combined 190 years of experience in the machine industry.

If you would like to troubleshoot with LeBlond, you can contact them at (888) 532-5663.
4. Training

You have high-performance manual machine tools that are precise and have the availability of parts and service. Now, you have to make sure your staff has the training to run the machines.

According to industry insiders, new workers are attracted to sanitary CNC machines. “[Newer employees] want to sit in front of a computer and run a CNC,” suggests Brad Unger, Shop Foreman of Pace Machine & Tool, Inc. “They don’t want to get dirty.”

Building experience on a manual machine translates later to programming a CNC one.

“You almost have to learn how to run it manually before you can program it digitally,” Unger adds. “Basically, the computer is running the [CNC] machine, but it still has to be machined the same way you did it manually. So you need guys like us to set the machines up and fixture them. You just can’t have someone just program [the CNC] that has no experience machining metal.”

Without proper manual experience, costly mistakes could multiply on, say, a CNC lathe. Possible fiascos include the lathe being incorrectly programmed to run into the chuck, run into the part too heavy or bend the part.

Or a new employee without substantial manual experience could produce a flood of costly, useless parts.
“He could program something to produce 2,500 junk pieces that cost the company $15,000, too," Shadel of Pace Machine & Tool says. "He programmed it wrong because he didn’t have enough practical machining education to know how to do certain things."

Apparently, experience is everything in a machine shop.

“You’re not going to learn it from books," Shadel reflects. "Some of the mathematics and formulas are learned from books, but you get the practical machining experience from a guy that’s already done it."

Some of training regimen from the machine shops of old has been lost. In the past, a new employee would train and alternate with at least five established workers, so as not to block up a veteran’s entire day.

The new worker would then go to school at night and learn the trigonometry and geometry necessary to operate the machinery.

The apprenticeship or on-the-job training would last approximately four years with 2,000 hours each year.

Many current machine shops lament a lack of well-trained new craftsmen. Industry sources suggest that companies look for machining program at community colleges or advertise for personnel in heavily industrialized areas such as the Midwest (Chicago, Detroit), the East (New York City) or West (California).

The lack of solid training for new personnel could mean much more dire consequences than just broken machinery.

“If someone doesn’t know how to properly run the machine, they could crash the equipment, get hurt or possibly get killed," Shadel concludes.
5. Safety

A. Safety is an important factor for all machine tools.

B. The machine operator should be sure that the safety devices (interlock switches, guards, etc.) that were furnished on the machine are operational and are being used properly.

C. The operator should inspect the tooling that is being used to machine the part. For example, tool holders, inserts and grinding wheels should not be used if they show signs of fatigue (cracked or broken).

D. For Safety Standards, please refer to the following American National Standard for Machine Tool documents:

1. Safety Requirements for Manual Turning Machines With or Without Automatic Control (ANSI B11.6)
2. Safety Requirements for Grinding Machines (ANSI B11-09)

Always wear safety glasses when operating manual machinery

When it comes to safety, here are some basic facts that you may or may not be familiar with:

- Wear safety glasses when operating a machine to keep tool fragments from breaking off and hitting your eyes;

- Remove all rings, jewelry and watches before operating a manual machine tool;

- Wear short-sleeved clothing that won’t get caught in the whirling parts of the machine; and

- With a lathe, make sure you don’t leave the chuck wrench in when operating the machinery or it can fly out and become a potentially dangerous missile.
These manual machine tool topics – performance, service, training and safety – depend on the ubiquity of this equipment that is still relevant in an era where CNC machines are dominant.

Manual machine tools are not going away. Chances are you are reading this paper on a computer screen that was manufactured in some way with the help of manual machine tools like grinders, lathes, drills, presses and milling machines to name a few.

In the old days, seven out of ten machinists were manually inclined with one or two holding out for the newfangled CNC equipment. Today, the reverse is true – most machinists operate CNC’s with a few holding out on manual equipment.

Still, the skills and experience to program CNC equipment comes from a background of operating manual machines.

When it comes time for you to consider a manual machine for your machine shop or manufacturing hub, we ask you to consider LeBlond Ltd., a supplier of parts and OEM equipment for LeBlond lathes, K.O. Lee grinders, Deka Drills, Standard Modern lathes, Johnson Presses and W.F. & John Barnes machinery.

LeBlond is a legendary name in the machine tool industry that has over 100 years of experience. When it comes to manual machine tools, LeBlond is your expert in finding equipment that is supported by ample parts and service.

Manual machine tools have been around for centuries. When it comes to picking a supplier, go with a company that will be around for decades more.
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