

# All-in-One Broaching Capability

FASTER, MORE EFFICIENT MANUFACTURING OFFERED WITH TABLE TOP DESIGN



The Table Top Broaching Machine combines new concepts with traditional broaching methods in a smaller unit (courtesy of American Broach).



The table top design features crossing T-slots for faster and more accurate setups (courtesy of American Broach).

American Broach & Machine Company, located in Ypsilanti, MI, has developed a new concept to address customer complaints regarding traditional broaching machines. The Table Top Broaching Machine is a plug-and-play device designed for fast operator setup and simple changeover that requires no special foundation, pit or operator stand and is not model dependant.

“Our customers want faster, simpler, and cheaper, and they want it in a small, convenient package,” says Ken Nemec, president at American Broach. “Our Table Top design is a clever merging of technology and physics where a broach cutting tool is pulled down through the broaching table. Our design melds known and new concepts together to effect the solutions our customers have been requesting while occupying very little floor space.”

While many of these concepts are not new to broaching, it is uncommon to see so many features and functions in such a small, compact machine design, Nemec says.

“No one has ever put the drive system completely under a table in such a compact manner, giving the user access to a flat locating surface with no obstructions, to produce small, light, table top broaching,” Nemec says. “These machines are quickly adaptable to many different applications.”

The new improvements made in this vertical, pull down broaching technology consist of a “teach function” for

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adjusting stroke, and the elimination of the machine frame as the support for force resistance thru bulk, girth and guideways.

“It is our contention that these features used together or separately will achieve the desired results within the scope of our patent,” Nemeč adds. “The Table Top Broaching Machine was designed to minimize space and capital equipment cost, while providing speed and performance for manufacturers with smaller lot sizes, constrained space, and a need for an efficient, quick change broaching machine.”

The machine will initially be offered in 24 inch and 36 inch stroke lengths, from 2–6 tons in power, with electromechanical dual-screw drive systems that eliminate the cadence (pounding) associated with hydraulic broaching machines. The twin-screw design provides smooth and steady power, increased tool life and part quality, while reducing the perishable tooling cost per part.

American Broach’s design features a simple flat table top broaching area

with crossing T- slots to accommodate fast, accurate setup. This one-piece solid table top has been designed to attach to a fabricated main box assembly, which is mounted on top of a coolant sump box base.

The modular design keeps the cost of build and maintenance service low, while maintaining structurally robust physical attributes by design, without the traditional girth used by broaching machines.

“In our design, the load distribution is transferred to the table top directly through the twin roller screw assembly without traditional machine ram, box way, rails, carriage, guide rods, or bearing cars. This eliminates the need for a heavy machine frame, and allows for a modular box design that meets our customers’ needs,” Nemeč says.

The Table Top Broaching Machine also features an unguided pull bridge powered by two spindles (roller or planetary); they are mounted under the table in a compact design to eliminate the need for guide rods or bearing ways that will not tolerate being mounted in areas with chips and coolant under the table. These spindles are fully enclosed by slide covers to prevent chip interference and coolant damage.

The spindles are powered by a tooth belt by way of over sized tooth drive pulleys; this over sizing allows a single motor to drive both spindles simultaneously and with extreme accuracy without positioning the drive belt in line in the space where the cutting tool travels. Tool location is monitored by motor rotation position tracking by a simple encoder, and the drive system is enclosed and sealed into the hollow bottom under the broaching table.

“Quick changeover between parts to accommodate small production lots is an important concept behind our machine design,” Nemeč says. “We developed a quick teach button feature that adjusts the stroke for the length of the tool automatically in seconds,

rather than using stops and switches, which do not hold up well in an ‘under table’ environment.”

Additionally, it takes several minutes of trial and error to set traditional stops. Now with a simple visual setting, the stroke length is set and no data entry or measurement is required. The operator simply lowers the broach tool in the teach setup slow movement mode, and when the tool is just below the part nest, the teach button is pushed. Each stroke will now stop at the exact spot.

Standard features in the machine design include coolant and air ports designed into the table top (plenum) for ease of distribution in various applications. A removable ring type splash guard accommodates large or irregular shaped parts that cannot easily be broached on conventional broaching machines.

As an add-on option, the Table Top Machine is offered with a simple retriever attachment that will allow for complete auto cycle without requiring the operator to handle the broaching tool. This modular retrieve unit can easily be attached via a precision prepared surface that is part of the Table Top. The retriever is quickly and accurately located with keys and standard T-slots to assure it is on centerline with the pull head. The unit is electric motor and belt driven; once the retriever is mounted and bolted down, it is just plugged in and is ready for use.

American Broach plans to officially debut the Table Top Broaching Machine at IMTS 2010, although three machines have been sold to broaching customers to date.

“What sets American Broach’s Table Top electromechanical broaching machine apart is that we have combined all of these recognized best broaching concepts and developed solutions together under the table, with a small compact footprint and simple



design with a low price tag,” Nemece says.

**For more information:**

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ery, drilling (and) coal are other fields and industries where large hobs are required. Of course the tooling has been around for a long time but machine manufactures making machines for that market have diminished.

“In the tool grinding market, there are maybe three manufacturers left

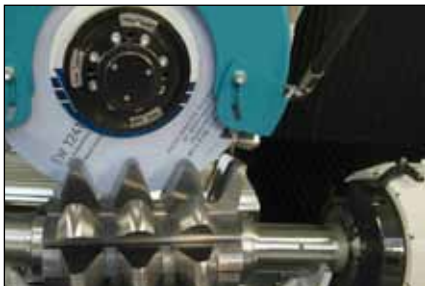
that will build machines up to three meters in travel length, machines to accept long tools such as broaches, long hobs, any long tool needed to be thread ground. In the last 10 years, Schneeberger has supplied that specialty market with the most sophisticated

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# Cutting Tool Sharpener

## HANDLES LARGE DIAMETER HOBS

In response to market demand for a machine capable of sharpening large, heavy hobs, J. Schneeberger has developed the Corvus C500 Coarse Pitch Hob Grinding Machine, which is capable of handling hobs up to 20 inches in diameter using wheels with equally large capacity.



“The need for larger hobs is created by wind generation. Larger gears demand larger hobs,” explains Rolf Herrmann, general manager for J. Schneeberger. “Mining, large machin-



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