



COGSDILL TOOL

products, inc.

APPLICATION *news*

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Cogsdill's ZX™ bottle-boring tool outperforms the competition

Better chip evacuation, cutting support, and surface finishes

A special Cogsdill ZX™ bottle-boring tool was designed to machine a 5.451 in. (138.46mm) diameter cavity bore and conical blend tapers (21° and 11°), leading into a 3.794 in. (96.37mm) flow bore. The customer was honing the flow (pilot) bore for size. A work length of 49.430 in. (1255.52mm) was required in order to machine the 21° taper, but the most challenging feature was the absence of cross bores or cavities, so that there was only one exit point for chips: from the open end of the tubular part.

A competitor had previously sold this customer a ZX-type tool for a similar application, with spring-loaded carbide support pads for piloting. Their design had two deficiencies: coolant backwash directed stray chips into the tool body, causing galling, and the positioning of support pads 6.5 in. (165.1mm) away from the tool slide meant that the pads failed to provide the necessary support to prevent tool chatter. Surface finishes were therefore unacceptable, with manual lapping required on most parts.

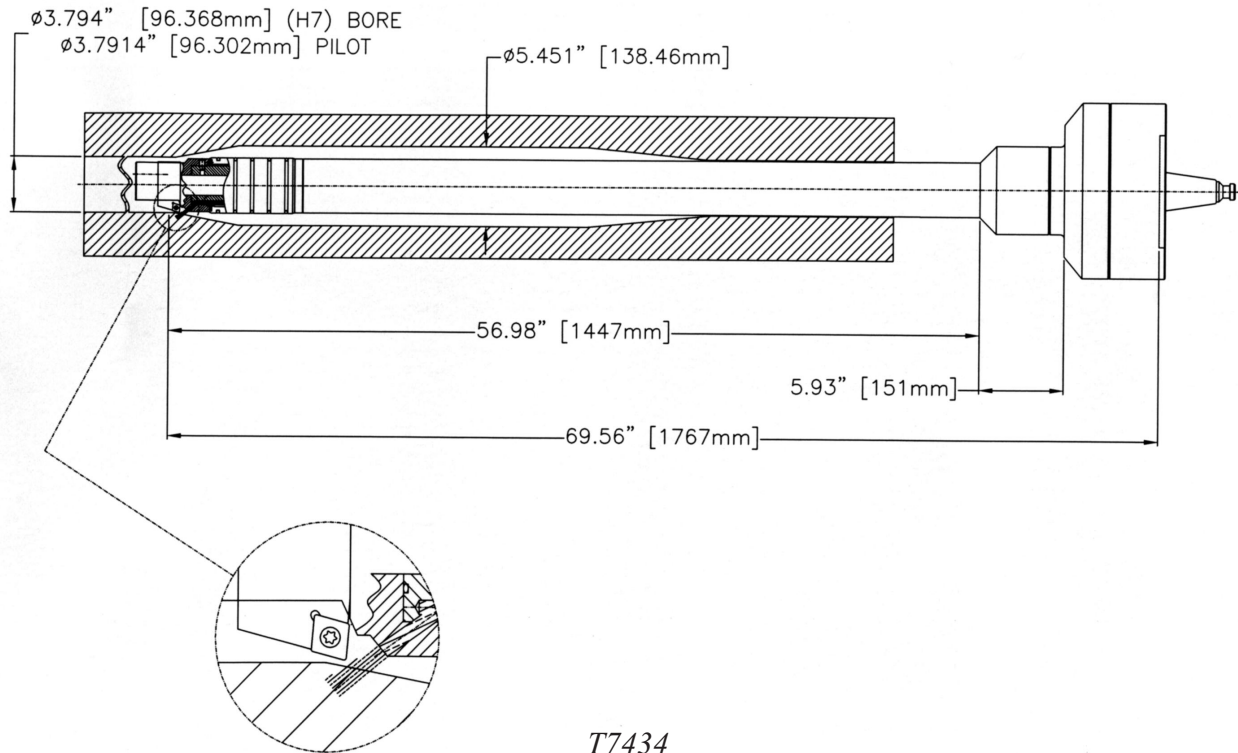
Cogsdill designed a special ZX bottle-boring tool with a stationary pilot for enhanced stability. The pilot assembly features four needle bearings in the I.D., allowing for tool rotation, and for five O-ring seals designed to keep coolant and chips away from the tool body. The pilot on the tool is positioned only 2.0 in. (50.8mm) away from the tool slide. The pilot diameter is .0026 in. (0.07mm) smaller than the 3.794 in. (96.37mm) bore diameter, thereby providing adequate support and ensuring superior surface finish.

A 3.701 in. (94mm) diameter drill tube was used in place of our standard extensions to provide maximum coolant flow to the cut area. The tool block housing was specially designed for directed coolant flow, flushing chips toward the open end of the tubular part. (Due to the length of the bore, machine coolant pressure and volume were insufficient to wash away all chips; the tool had to be withdrawn after every two machining passes (.058 in./1.47mm deep) in order to clear all chips from the bore.)

Cogsdill's ZX™ tool design outperformed the competition in this difficult bottle-boring application.

— see reverse side for tool and part drawing and application data —

Application data	
Machine type	Horizontal table-type boring mill
Material type	L-80 type 13CR low carbon steel
Tool type	Cogsdill ZX bottle-boring tool
Spindle speed	225 RPM (roughing), 250 RPM (finishing)
Feed rate	.012 IPR/0.31mm/rev (roughing) .005 IPR/0.13mm/rev (finishing)
Cycle time	N/A
Coolant	Semi-synthetic (at 3.31BAR)
Size required	5.451 ± .015 in. (138.46 ± 0.38mm) bore with tapers each end
Size achieved	5.451 ± .001 in. (138.46 ± .025mm)
Finish required	64 Ra
Finish achieved	Better than required



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Low set-up time, high machining rates, higher productivity, lower costs! For more information, refer to our full catalog on ZX™ Boring, Facing, and Contouring Systems. Visit our website at www.cogsdill.com.