

## Spring into engraving action

Many methods exist to mark metal parts, from a hammer and chisel to high-tech tools. Hoosier Tool & Die Inc. was engraving parts with center drills in a solid holder but found that when the Z depth of a part's surface changed, the engraving depth changed as well. "We'd have one part where the engraving would be real heavy, and then a few parts later the engraving would be gone," said Darren Davis, manufacturing engineering manager of the Columbus, Ind.-based company, which has a job shop for making one- to 20-piece lots and a production side for large-volume runs of diesel automotive parts.

Engraving tools wear, and their marks therefore change, but HTD's problem was from the workpiece surface changing, such as when manually loading parts into a vise without having a premachined surface for engraving. "We had a hard time without touching off on every one of those parts to get a consistent engraving depth," Davis said.

Problems also arose when engraving ½"-high part numbers into the cast surface of aluminum brake housings. "We had to physically touch the tool off on every part because the casting varied up to 0.100," Davis said. He added that the touch-off process was not only time consuming, but a setup person was required to perform it rather than an operator, who only makes offsets before hitting the cycle-start button. In addition, center drills tend to generate burrs when applied for engraving.

After seeing an advertisement for spring-loaded engraving tools from 2L inc., Hudson, Mass., Davis decided to give them a try. The tools are for application in CNC machine tools and can engrave uneven surfaces because the spring-loaded design provides 0.40" of tool bit travel and constant pressure to the engraving tool bit as it moves over the surface. Therefore, slight variations from part to part don't create illegible engravings because the tool bit floats back and forth within the toolholder to negate inconsistencies.

HTD has five spring-loaded engraving tools that it applies in its Hurco vertical machining centers and Mazak Integrex multitask machines to primarily engrave part and revision numbers into steel, such as 4140 annealed. When engraving steel, Davis runs the tools at machining parameters of about 5,000 rpm and 15 ipm, which he said are aggressive. "We're trying to run our parts fast."

Achieving a consistent and legible engraving from part to part without touching off a tool has increased HTD's throughput. For example, Davis said HTD was producing



A spring-loaded engraving tool from 2L provides 0.40" of tool bit travel and constant pressure to the engraving tool bit as it moves over a surface, including an uneven one.

35 cast aluminum brake housings per 8-hour shift and is now able to make 50 per shift using the spring-loaded engraving tools.

Davis noted that the Hurco machines have lettering software built into them. "On the Mazaks, we do that programming offline so we can do whatever letter style we want on those," he said, adding that when the part comes out, no secondary operations are required. By doing the engraving in a CNC machine, dedicated engraving machines or marking systems are not required.

"The spring-loaded engraving tool definitely simplified the engraving process and added consistency," Davis said. "We're trying to get one in every machine as we go."

**END USER:** Hoosier Tool & Die Inc.

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**CHALLENGE:** Maintain a consistent engraving depth without touching off an engraving tool on every part.

**SOLUTION:** Spring-loaded engraving tools.

**SOLUTION PROVIDER:**

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