PRESS RELEASE

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MOLLART'S DRILLING TECHNOLOGY AND COMPETITIVE DESIGN WINS £700,000 MACHINE EXPORT ORDERS

By designing a deep hole drilling machine and developing the process around the latest gundrilling tool technology, Mollart Engineering was able to outperform competitors to win a three machine export order. The deal worth over £700,000 is for machines to produce a series of oil feed holes in shafts for use in a new automotive transmission being produced in Canada.

Said sales director Ian Petitt: "Our proposal to the Canadian customer was based on the very latest gundrill tooling technology from Botek and the machine was developed around the tool to allow us to drill 6 mm holes at a penetration rate of 200 mm/min in the high strength steel shaft.

As a result of the package we put together, the customer was able to reduce the number of machines originally perceived to satisfy production needs from 12 to just three."

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The four spindle, three-axis Mollart Omnisprint LD4-75 will produce three oil feed holes on a very close 11 mm pitch circle (PCD) in the ZF, eight speed automatic transmission shaft to three different blind hole depths of 351 mm, 366 mm and 380 mm. Following the Mollart machine operation a series of cross holes will be drilled to break into the deep holes.

Significant in the gundrilling process is the latest Botek Typ 113-HP single lip, solid carbide tool that incorporates a specific nose grind development to ensure small fine chips are created and a highly polished flute along its 600 mm length. It has a special kidney-shaped high pressure coolant channel to maximise chip evacuation due to the volume of material required to be despatched from the cutting zone.

In acceptance trials on the first machine due to be delivered from Chessington, the high penetration rate Botek gundrill, which will produce 1,000 mm of total hole depth in each shaft, maintained its true position (TP) tolerance requirement of 0.9 mm over each hole to within a TP of 0.3 mm.

The Mollart Omnisprint machine is a fully integrated processing cell with two 4 kW main spindle drives running at 3,900 revs/min, a three-axis table and the latest advanced filtration, coolant and swarf management is included. An initial paper filtration of 20 micron feeds neat oil through a micro mag fine filter, heat exchanger and chiller in order to maintain temperature at 30 deg C. A continuous centrifuge is also incorporated to remove and recirculate any oil captured from chippings. Special roller ways have been designed into each axis and the vertical and horizontal X and Y axes to the table have a hydraulic brake to ensure maximum stiffness of the set up.

To add to the application difficulties, Mollart engineers had to design a pre-location bush concept for each of the four shafts being processed simultaneously that could overcome any influence of a centre drilled cone in the end of the part that breaks into the start position of each of the drilled holes. This was to ensure each deep hole on the 11 mm PCD was maintained despite the lack of a solid wall of material all around the circumference of the drilled hole. The result of this interrupted cut could have led to a swarf trap and tool breakage, allow the tool to wander offline, become chipped or the loss of coolant pressure from the 130 bar system.

Each of the four shafts being processed are first loaded to vee blocks and positioned by a pre-machine bushing locating from the end face chamfer.

The table then repositions in X and Y and a special bush seals against the face using the centre drilled cone as the final location. Two sensors on each shaft will indicate misload. In addition, the Mollart-designed fixture system will have to accommodate the integration of robot loading automation being added by the customer once installed in Canada.

Each of the four shafts are drilled simultaneously to produce one hole in each. The drill is retracted to the pre-bush position and running the spindle in reverse to protect the cutting edge while entering the next hole.

All four shafts are then moved to the next hole and the process repeated to meet the different depth requirements for the two final series of holes.

Under control of Fanuc 0i-MD the machine incorporates tool life, tool tip loading and feed as well as coolant pressure monitoring and has the interface ready for the robot to be integrated.

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