



Leader in Superabrasive Finishing Systems

FPM-3X

3 Axis Single-Pass Bore Finishing



Improves Geometry and Offers Flexibility when Finishing Large, Multiple Bore Hydraulic Valve Bodies

Manufacturers of large hydraulic valve bodies face a challenge aligning and finishing the bores once the bodies have been stacked. Engis has designed a three axis single-pass bore finishing system to address this challenge.

The FPM-3X enables bore finishing after stacking of the valves, which improves overall cylindricity and roundness. Improving the quality of the valve body results in better performance and less downtime in the field.

FPM SERIES

Machines Features:

- Linear bearing vertical slide with ball screw feed and 750mm stroke
- BT-40 style spindle with hydraulic drawbar arrangement
- X-Y Axis linear bearing horizontal slide base
- 8 – 13 pocket automatic tool changer
- Wireless probe system for precise bore location



Wireless Probe System allows precise location of part bores and transfer into G-Code coordinates for accurate positioning of the table during the metal removal process.

ENGIS CORPORATION

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BORE FINISHING



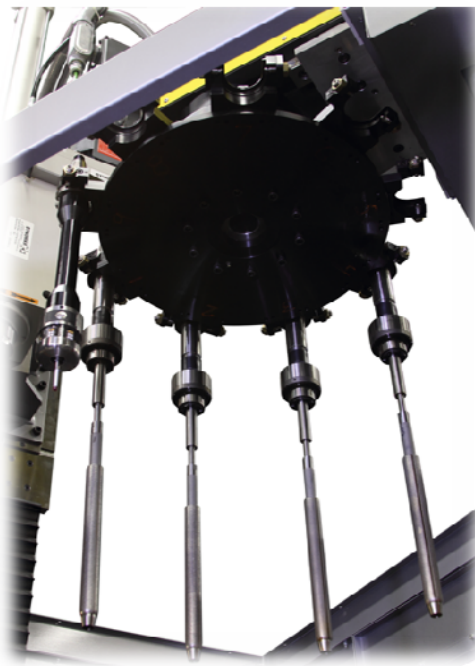


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FPM-3X

The FPM-3X can finish stacked valve body bores to a cylindricity of 2 microns and a diameter of +/- 1 micron, especially those with multiple bores of different diameters. To precisely locate the bore under the BT-40 spindle, the FPM-3X uses a wireless Renishaw CNC probe to establish bore location; position information is automatically translated into G-Code Coordinates.

This system also features full CNC controls with a Z-stroke of 750mm, an X-stroke of 1066mm and a Y-stroke of 100mm. The slide base can accommodate parts up to 3000 lbs.



8 – 13 Pocket Automatic Tool Changer allows the machine to be set with up to 13 tools and automatically changes the tools from rough to finish without any operator involvement.

Typical Hydraulic Stack Valve Application

Bore Diameter:	25mm	Bore Length:	245mm
Material:	Cast Iron	Number of Bores:	4
Bore Type:	Thru	Stock Removal:	.070mm
Tool #1:	25.020mm	Diamond Size:	60/80
Tool #2:	25.034mm	Diamond Size:	100/120
Tool #3:	25.039mm	Diamond Size:	200/230
Tool #4:	25.041mm	Diamond Size:	325/400

Most stack valves are between 100mm and 300mm. To straighten a bore that has a banana shape, diamond tools are needed that are longer than the entire bore to span. Most machine centers do not have capacity for that stroke length or sufficient depth between part and spindle, but the FPM-3X does!

SPECIFICATIONS:

Required Air Pressure:	90 PSI 5 CFM
Operating Voltage:	230V 60Hz 3Pz
Horizontal Slide Base – X Axis Linear Bearing Slide: Y Axis:	Up to 1066mm of stroke Up to 100mm of stroke
Slide Base Load Capacity	Over 1,000 lbs
Spindle Motor:	5 HP Standard
Spindle Speed:	100-1200 RPM
Spindle:	BT-40 with hydraulic drawbar arrangement
Available # of Tools:	8 - 13
Controller:	Mitsubishi (standard) Other types available
Programming:	G-Code

OPTIONS:

- 208 liter (55 gal) coolant system with double cartridge filtration
- Magnetic separator addition for filtration
- Full perimeter guarding
- Automation and gauging packages available
- Standard and custom fixturing packages available

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