

moore tool

reconditioning and converting to CNC
for manual #3 & G-18 jig grinders

before





reconditioning

&

converting to CNC

for manual #3 & G-18 jig grinders

The Moore Tool Company, a leader in precision machine tool design and manufacture, reconditions and converts manual #3 and G-18 jig grinders to CNC (computer numerical controlled) machines. Driven by our customers' requirements, Moore can provide a full mechanical rebuild of spindles, housings and ways, recertified to the tolerances of a new machine. During the conversion, all components are disassembled, cleaned, prepared, repainted, and rebuilt. The base, cross slide, table and column are scraped, lapped and adjusted to specification. The reconditioned and converted equipment operates with the convenience, speed and accuracy of a new CNC jig grinder.

1 | New Housings & Motors

The manual handwheels and dial housings are replaced by new motor housings and direct-coupled high-efficiency Fanuc servomotors. The direct-coupled motors provide a quick, efficient and improved means of driving the X- and Y-axes.

2 | CNC System

The column-mounted electrical box is replaced with a floor-standing electrical enclosure that contains the CNC system, axes drives, power supplies, machine interfaces, and other associated electrical circuitry.

3 | Manual Pulse Generator

The hand-held Manual Pulse Generator (MPG) hangs conveniently off the CNC workstation, allowing immediate intervention in velocity control.

4 | Full Alphanumeric Keyboard

The full-feature keyboard allows for program creation, entry and editing directly at the machine's control panel.

5 | Improved Air Flow

The hydraulic box is upgraded to include a low air pressure sensor and improved air filtration.

6 | Ease of Operation

All MDI and CNC operations are performed from the operations control panel immediately adjacent to the machine.

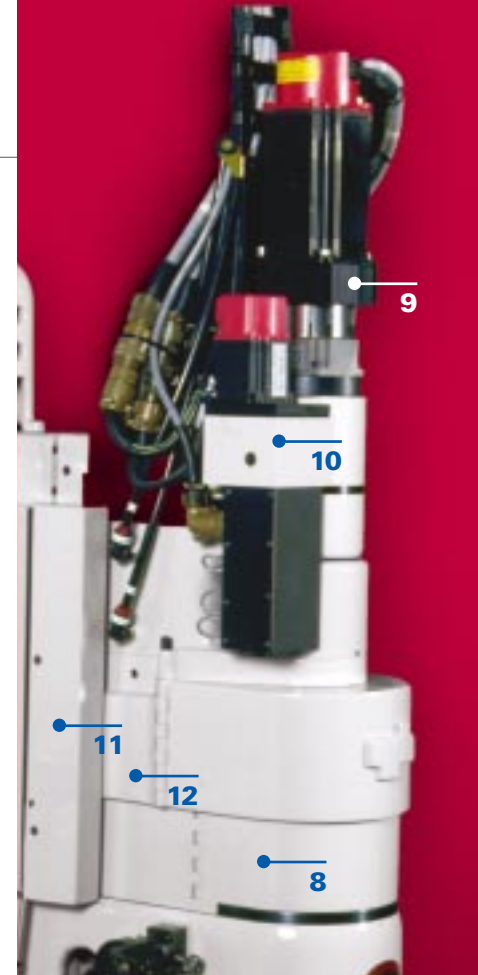
7 | Programmable Reciprocation Rate

Provides MDI operation and manual overrides directly from the panel.

8 | Spindle Housing

The spindle housing is completely rebuilt, including all bearings and components required to achieve new machine performance.

spindle assembly



9 | Programmable Planetary & C-Axis

The C-axis handwheel and worm gear are removed. Full CNC operation of the C-axis and planetary spindle functions is achieved with a single drive-train, a single servomotor-gearbox and pulsecoder mounted to the top of the yoke assembly. Planetary grinding speeds can either be controlled from the operator's panel or programmed in the CNC. The C-axis motion may be determined by successive block commands. Contouring is controlled by Automatic C-Axis Normalcy.

10 | Programmable U-Axis

The manual outfeed dial is replaced with a precision gear drive and motor-encoder unit. The CNC control provides both MDI and full programming capability of the U-axis outfeed slide.



11 | Programmable Reciprocation

The manual reciprocation rate knob/valve is replaced with a servo-controlled valve in the conversion, providing reciprocation speed control from both the operator's panel and the CNC part program. The programmable reciprocation eliminates the manual setting of trip rods for different zones, and allows any number of CNC-defined end point zones within part programs.

12 | High-Speed Reciprocation Option

Cylinders, manifolds, valves, pistons, and packings are all upgraded, and a precision linear glass scale is mounted to the yoke/housing assembly to provide increased reciprocation speeds up to 175 cycles per minute at a stroke length of one inch. System operation under the increased speed is also improved, including end point repeatability and programmable reciprocation ranges.

13 | Continuous Path Capability

The precision roller bearings and cages that are utilized on all Moore Roller-Way machines are used to convert the Friction-Way axes to Roller-Way axes. Precision roller bearings are ground, lapped and matched in accurately machined cages and installed on the X-axis V-Ways and the Y-axis V- and Flat-Ways. This ensures smooth, almost friction-free and geometrically accurate motions on the X- and Y-axes, and allows for precise positioning and contouring motions.

14 | Fast & Accurate Axes Motions

Precision ballscrews with preloaded ballnuts replace the existing leadscrews in the CNC conversion. Great attention is paid to the alignment of the ballscrews parallel to the V's, as well as the height of the ballnuts, to allow perfect coaxial motion over the full axes travels. This provides a fast and smooth motion of the X- and Y-axes.

15 | Contamination Protection

New accordion covers are installed on the table, cross slide and base, and completely enclose the X- and Y-axes. They provide contamination protection for the ways, ballscrews and linear feedback scales.

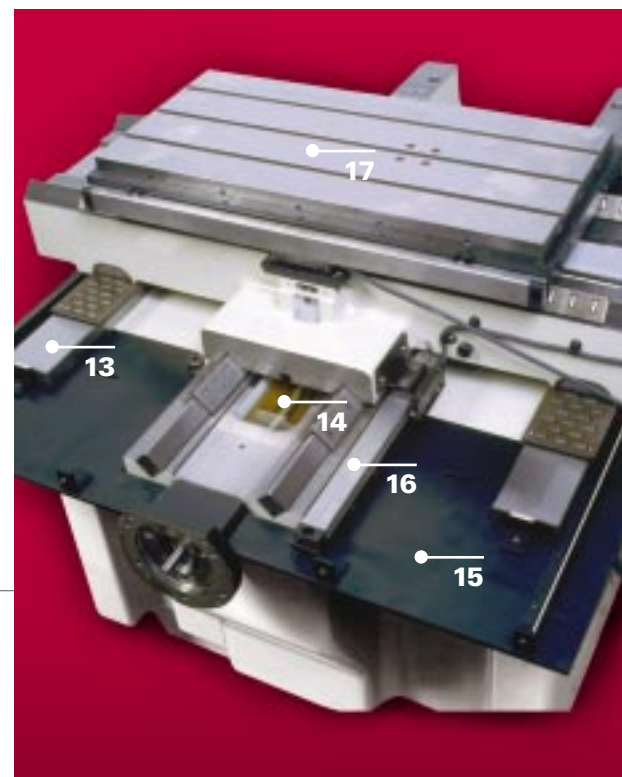
16 | Scale Feedback

Precision glass linear feedback scales are precisely mounted on the X- and Y-axes. The scales provide accurate positioning measurements at any axis speed independent of the ballscrews.

17 | Factory-Master Accuracy

All working surfaces (ways and tabletop) and mating surfaces are checked and calibrated to factory masters, scraped and lapped to achieve original machine geometric accuracies.

ways & tabletop



specifications

Capacity

Table working surface	11.0 x 24.0 in. (280 mm x 610 mm)
Travel X longitude	18.0 in. (450 mm)
Travel Y cross	11.0 in. (280 mm)
Table top to wheel collet	2.0 to 18.0 in. (50 mm to 450 mm)
Spindle housing travel	12.625 in. (320 mm)
Quill travel Z vertical	3.5 in. (89 mm)
Spindle angular adjustment	+/- 1.5 degrees
Grinding Capacity (Hole diameter)*	.016 to 5 in. (0,4 mm to 127 mm)

*with extension plate

Speeds and feeds

Traverse speed: X & Y axes	60 in./min. (1,520 mm/min.)
Main spindle range	2 to 300 rpm
Grinding wheel with air heads	6,000 to 175,000 rpm
Reciprocation @ 1 inch (25 mm) stroke length – high speed	2 to 175 cycles/min.

Accuracy

Positioning: Step Gage*

Deviation in full travel: X & Y axes	90 μ m. (2,3 μ m)
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Positioning: VDI/DGQ 3441*

Positional uncertainty P: X axis	120 μ m. (3,0 μ m)
Positional uncertainty P: Y axis	120 μ m. (3,0 μ m)
Positional deviation Pa: X axis	100 μ m. (2,5 μ m)
Positional deviation Pa: Y axis	100 μ m. (2,5 μ m)

Contouring*

X, Y & C at 250 mm/min., measuring a 8 inch (200 mm) ring gage	120 μ m. (3,0 μ m)
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Geometric: Squareness*

Full travel: X to Y axes	40 μ m. (1,0 μ m)
Column Squareness	90 μ m. (2,3 μ m)

Geometric: Alignment*

Total spindle travel: Parallelism of spindle to column guideways	90 μ m. (2,3 μ m)
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(All statements concerning accuracy are based on calibration temperature of 20 +/- 0.5 degrees C [68 +/- 1.0 degrees F])

*Accuracies guaranteed with complete remanufacturing only



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