

ROTTLER

THE CUTTING EDGE

SG10XY

Cylinder Head Seat & Guide Machine

With ACTIV Spindle & Guide-to-Guide Automation

Xcelerate

your machining time,
productivity and profits!



Machining Equipment
Created for Performance
Racing & Engine
Remanufacturing.

So Advanced, It's Simple.

SG10XY CYLINDER HEAD SEAT & GUIDE MACHINE

ACTIV SPINDLE

The Centerline of all valve guides in one cylinder head are not always in perfect alignment. The SG10XY has the latest design **ACTIV** Spindle which has a sphere built inside the spindle which compensates for any misalignment and allows the **UNIPILOT** tooling system to automatically center with reference to the valve guide centerline while the workhead is floating on air cushions. Once the floating stops and the workhead clamps, the **UNIPILOT** and valve guide centerline are maintained while the valve seat is cut giving excellent **CONCEN**. When doing machining operations other than valve seat cutting such as valve seat housing counterboring and valve guide reaming, the spindle is required to be locked vertically. The **ACTIV** spindle has a pneumatic locking system that locks the spindle sphere rigidly vertically for other types of machining requirements.

Light Weight Workhead floats on Base Plate

The new design SG10XY has a very light workhead that floats independently on a base plate allowing precise centering of the pilot in the valve guide. The base plate moves the workhead from guide-to-guide by a precision ball screw and servo motor. The complete assembly clamps with air pressure for rigid machining.

Quick X Axis Alignment System

(Patent Pending)

This feature is the **secret** to productive guide-to-guide automatic machining! After the cylinder head is clamped in the fixture, 2 pilots are installed in the outer valve guides and 2 the alignments arms are moved on linear slideways inline with the 2 pilots, at this stage, the complete fixture assembly floats on air and the 2 pilots contact the 2 alignment arms which aligns the valve guides with the X axis movement of the workhead. At this stage, the fixture clamps on the machine table, the 2 pilots are removed and the cylinder head is ready for automatic guide-to-guide machining.

Variable Speed Servo Spindle Drive

CNC Servo Spindle Motor Drive controls the final speed and number of revolutions then lifts automatically giving perfect surface finish results – every time!

Multi Angle Seat Cutting

Rottler's Precision CNC Ground Fine Grain Carbide Seat Cutting Inserts are available in many different designs to suit customer requirements: single angle, multi angle or curves and radius shapes are available. All valve seats in a cylinder head are exactly the same and the SG10XY cuts every seat to the same depth.

Cutting Insert Sharpener

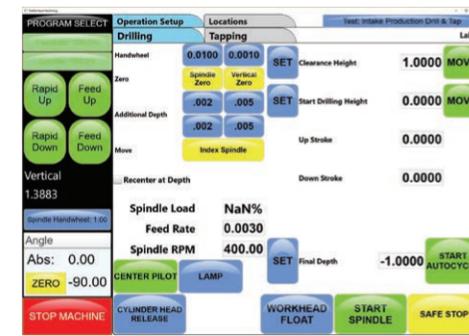
Machine mounted diamond wheel tool sharpener for fast, easy sharpening of multi angle cutting inserts.

Electronic Level and Angle Sensor

Digital Readout on the Touch Screen allows different Cylinder Heads to be levelled quickly and accurately.

Built in Vacuum Tester

For quick checking of valve seats before removing the cylinder head from the machine, ensuring perfect valve seal.



Windows Touch Screen Control

Only buttons and information required for each mode is displayed at one time. Easy to learn – no CNC experience required. Available in foreign languages.

Rigid Machine Construction

Heavy thick wall cast iron machine castings and precision machining during the manufacturing process give excellent chatter free valve seat cutting. Heavy duty base cabinet extended to the rear for safe handling when machine has to be moved. Recessed toe kick allows more comfortable machine operation.

Large Diameter Spindle

The SG10XY has a large diameter 3.150" (80mm) heavy duty spindle assuring rigidity for chatter free operation. Outer spindle support bearings are adjustable over the length of the bearing area, similar to high precision boring bar design giving decades of use.

Tool Storage Device

Intake and Exhaust Seat Cutting Tooling is preset for quick change. The Tool Storage Device has sensors and when a tool is removed to be installed in the spindle, the software automatically sets which tool is to be used – Intake or Exhaust.

Automatic Spindle Lock Nut

Patented Spindle Locking Nut system offers automatic tightening of tools in spindle. Won't come loose when cutting. One hand operations, push tool up and spindle lock nut tightens automatically, ejects tool when loosened.

LED Work Light

2 LED work lights are built into the workhead either side of the spindle so that no shadows are visible when inspecting valve seats



Rottler's Rigid Precision carbide centering UNIPILOTS are manufactured to less than one tenth (.002mm) tolerance. Combined with the light weight air float work head the SG10XY gives perfect centering in the valve guide and the best concentricity of any machine on the market.

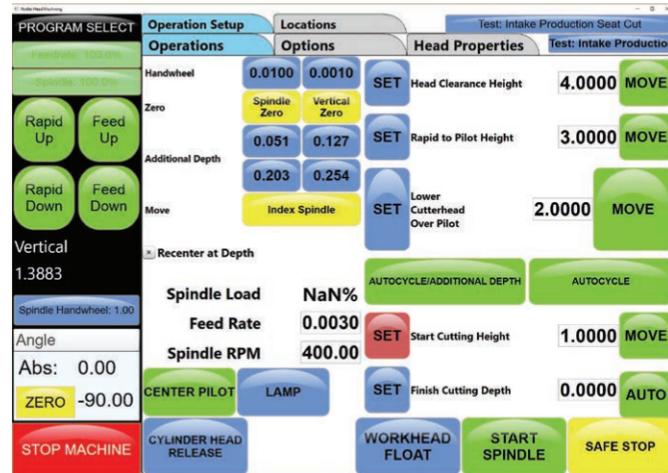
DFC purchased their first pieces of Rottler equipment in 2012 with the goal of having the highest quality diesel engines, only possible by having the best equipment in the business. We started with a SG8M but as our business grew we needed to upgrade to even more efficient machines. In 2014 we added a SG9MTS and an SG10X which dramatically increased our production capabilities and quality to a level far beyond other remanufacturers in Canada. We have now received Rottler's newest machine, a SG10XY which we are planning on using exclusively for 5.9 Cummins cylinder heads due to it being able to work on all 24 guides or seats while one of our machinists is able to operate other equipment during its cycle time. Our quality and efficiency would not be possible without these pieces of equipment and we can't thank Rottler enough for their amazing equipment and support over these past few years and are proud to use their equipment exclusively for our engine machining needs.

– Matt Adams, President  **DFC DIESEL**, Edmonton, Alberta Canada

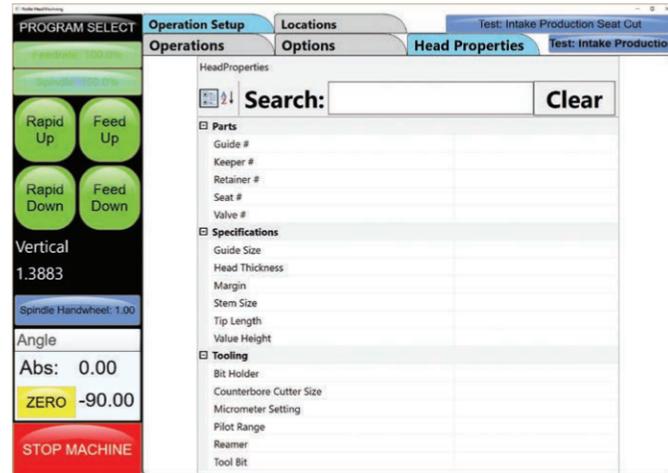
WINDOWS TOUCH SCREEN CONTROLS

Rottler New Technology Touch Screen CNC control uses 'state of the art' Direct Motion Control Technology and Windows Operating System. The PC computer links directly to the internet for future software upgrades and servicing worldwide. Rottler technicians are able to connect direct to the machine computer.

Conversational Touch Screen Control allows simple programming for many cylinder head machining operations such as Seat Cutting, Housing Boring, Guide Reaming, Drilling, Tapping, and many more functions. No experience required and easy to operate with information saved for future use. Store additional information in the SG10XY computer such as specification manuals, machining data, etc.



Main Control Screen allows settings for vertical movement of spindle, speed and feed of cutting, and various buttons for setting up a new program.



Information and Specifications can be saved together with the programs for each cylinder head. All programs can be backed up for security.



Multiple Cylinders/Valve Guides are programmed so that the SG10XY can move automatically from guide-to-guide – unattended. The slider allows 24 valve guide centers to be programmed in X and Y location.



Dwell and Retract are the important settings that allow precision valve seat machining for features such as surface finish and CONCEN.

CYLINDER HEAD TECHNOLOGY

According to industry research, cylinder head work remains the single biggest part of the typical gas and diesel engine rebuilding business.

With today's engines, the terms "close enough" and "almost" are unacceptable. Yesterday's equipment offers neither the speed nor accuracy required. Outdated equipment is slow to setup and needs more operator skill. Valuable man-hours that could be better spent on other tasks are often wasted doing things the old-fashioned way.

Thanks to our pioneering use of electronic controls and state-of-the-art cutting tools and fixturing, Rottler has overcome many of the traditional bottlenecks that slow work flow through a shop. Operation and programming of Rottler machines is done using ergonomic touch screen positioned on the front of the machine. The display tells the operator exactly where the spindle is positioned at all times.

ACTIV Spindle

The SG10XY has the latest design **ACTIV** Spindle Technology. The Rottler **ACTIV** spindle is mounted on a sphere, which allows the **UNIPILOT** tooling system to automatically center with the valve guide centerline while the workhead is floating on air cushions. Once air floating stops and the workhead clamps, the **UNIPILOT** and valve guide centerline are maintained while cutting the valve seat.

The **ACTIV** spindle can be used just like a fixed spindle – sphere is locked by air pressure vertically so jobs like reaming, drilling, tapping, etc., can be accurately done on the **ACTIV** spindle machines.



Unipilot

The Speed of Live and the Accuracy of Fixed

CONCEN

Rottler **UNIPILOT** patented tooling loads securely into the Rottler Automatic Quick Clamping System holding the tooling in the spindle without the need for wrenches.

The **UNIPILOT** Tooling system allows the carbide centralizing **UNIPILOT** to work like a live pilot. **UNIPILOT** Tooling stays in the spindle while moving from valve guide to valve guide. Rottler

UNIPILOT Tooling has a fixed pilot design to improve **CONCEN** eliminating clearance found in live pilots.

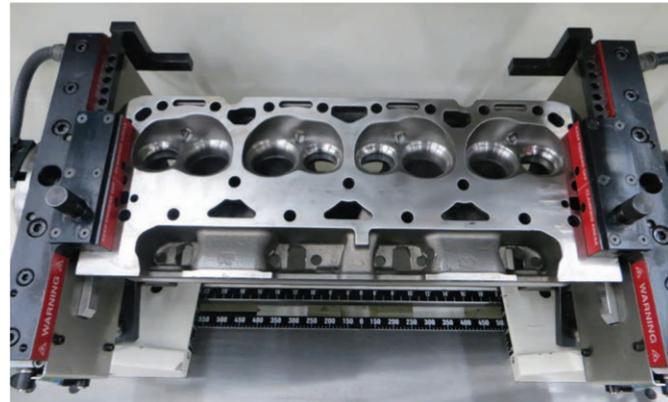
The lower taper on the spring loaded **UNIPILOT** easily enters the valve guide. The spring loaded upper area fixes and centers in the valve guide automatically eliminating clearance between the pilot and guide.

After cutting the valve seat, the **UNIPILOT** rises with the spindle ready to float over the head gasket fire decks in position to enter the next valve guide.

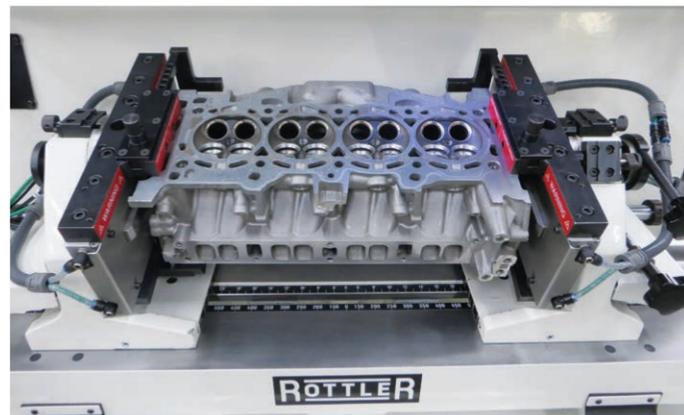
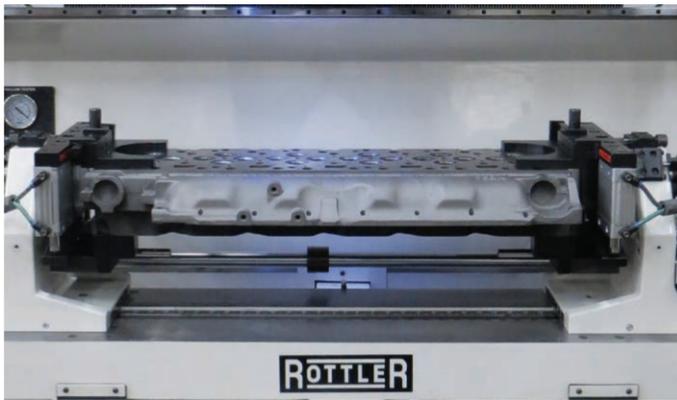
The **CONCEN** trademark is Rottler's promise of quality. **CONCEN** creates the most accurate and versatile seat and guide machines on the market today. The centering action of Rottler's Precision Carbide **UNIPILOT** System, supported on our balanced air float work head, give perfect centering in the valve guide. The Rottler combination creates the best **CONCEN** of valve seat to valve guide in the industry.

PRODUCTION FIXTURE

The PER Production Engine Remanufacturing Fixture allows cylinder heads to be clamped automatically by air pressure – no manual clamping is required! Just place the cylinder head on the fixture and the head is automatically clamped upwards by air pressure. The height of the cylinder head is always the same with reference to the head gasket surface so valve seats are machined to the same equal depth, head after head.



Special Adapter Plates allow cylinder heads to be loaded by a robot for fully automated production.



Valve Guide Machining

The Rottler SG10XY can automatically drill and ream valve guides for cylinder heads that do not have removable valve guides such as Cummins B series. Automatic Software and special solid carbide pilot/core drill/reamers allow all valve guides to be machined in one automatic cycle – unattended!

TOOLING



Triangle Tool Holders

Indexable Triangular Coated Carbide Tool Holders in 10, 20, 30, 45 degrees. Ideal and economical when cutting only one seat angle and for boring our old inserts and boring new insert housings.

Fixed Diameter Milling Heads

For boring seat ring housings for standard seat rings – gives correct interference for press fit with no adjusting or setting. Indexable Carbide Inserts have 4 corners and are easy to change when dull without any adjusting or setting. No need to purchase a new cutterhead when the inserts get dull.

Precision Collet Chuck

Allows holding of reamers, cutters, drills, taps and other tools for special machining operations.

Universal Chuck

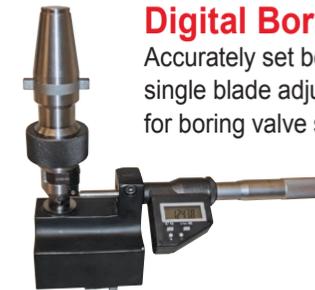
For general drilling and tapping work. Often used for spring seat and valve guide seal tooling.

MEASURING INSTRUMENTS



Valve Seat CONCEN Measuring Gage

Rottler's CONCEN gage allows concentricity to be easily and quickly checked to ensure accuracy



Digital Boring Micrometer

Accurately set boring diameter to any size with single blade adjustable cutting inserts and tooling for boring valve seat housings for new seat rings

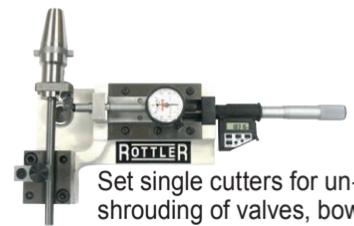
Rottler's 6 in 1 Setting Fixture makes precision valve work simple and fast!



Set seat pocket cutters to proper diameter



Check valves for run out and diameter (also allows precision setting of valve margin when setting up multi-angle cutters)



Set single cutters for unshrouding of valves, bowl work or seat ring removal.



Set multi-angle seat cutters to exact diameter



Check pilots for bend and diameter

STANDARD EQUIPMENT

Standard Equipment Includes:

- Special Version Machine for Automatic Guide-to-Guide in X and Y directions allowing different lines of valve guides and seats to be machined automatically - unattended operation
- Special Alignment System for fast set up of wide variety of cylinder heads (Patent Pending)
- ACTIVE SPINDLE - Spherical Pneumatic Automatic Alignment System built into the Spindle for fast location of the pilot into the Valve Guide and Accurate Centering (Patented)
- CNC (Computer Numerical Control) Touch Screen Control using Windows Operating System and Industrial PC with Intel Processor
- Internet connection to the machine computer must be provided.
- Automatic Cycles for Seat Cutting, Housing Boring, Guide Drilling and Reaming, Thread Tapping.
- Programming and Machine Operation thru 15" (380mm) extra bright touch screen.
- Electronic Hand Wheel for manual operation in .001" (.01mm) or .010" (.25mm) increments per Hand Wheel Detent
- Precision Digital Readout, .0001" (.002mm) Resolution
- On Screen Database to save all specifications, tooling, parts information
- Heavy Duty Spindle with Rottler R1 taper - Diameter 3.150" (80mm) Hardened and Ground with 7.5" (190mm) of vertical travel
- Rottler Automatic Tightening and Quick Release Spindle Lock Nut System for One Hand Operation for fitting and removing tooling to and from the spindle
- Spindle Travel by Precision Ball Screw & AC Servo Motor - Infinitely Variable Vertical Movement - Z Axis - Up and Down - 7.5" (190mm)
- Spindle Rotation by AC Servo Motor - Infinitely Variable to 1000 RPM
- Machine Work Head Floats on Air Cushion for Precision Centering
- Machine Work Head moves by servo motor in X axis by precision ball screw - 40" (1025mm) Travel
- Machine Table/Fixture moves by servo motor in Y axis on linear slideways - 4" (104mm) Travel
- Spindle Head Tilt - 10 Degrees to left and right for canted angle valve guide cylinder heads
- Pneumatic Quick Clamping Production Fixture - PER-FIX allows the cylinder head to be clamped upwards against stops with air pressure - the cylinder head is simply pushed back into the fixture and the clamping is automatic.
- Tooling Storage Cabinet and Mounting Arm
- Built In Vacuum Tester including Hose, Filter and Pads
- 2 LED Work lights - either side of the spindle giving shadowless view of valve seat area
- Paint Color Code: RAL9002 (Grey White)

SPECIFICATIONS

Valve Seat Diameter	.550" – 3.150"	14mm - 80mm
Maximum Cylinder Head Length (with PER fixture)	38"	965mm
Spindle Diameter	3.150"	80mm
Spindle Speed	Variable to 1000 rpm	
Maximum Spindle Stroke - Vertical	7.5"	190mm
Maximum Tilt (either side of zero)	10 degrees	
Distance from Table to Spindle	19.5	495mm
Electrical Requirements	208/220V, 15A, 50/60Hz, 1Ph	
Air Requirements	90-100 psi	6-6.6 BARS
Spindle Motor - AC Servo	3.47HP	2.59kW
Machine Dimensions	53" wide x 25" deep x 80" high	1346mm x 635mm x 2032mm
Working Dimensions	84" wide x 42" deep x 80" high	2134mm x 1067mm x 2032mm
Shipping Dimensions	60" wide x 88" deep x 88" high	1524mm x 2235mm x 2235mm
Shipping Weight	3200 lbs	1455 kg

Specifications and design subject to change without notice.

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