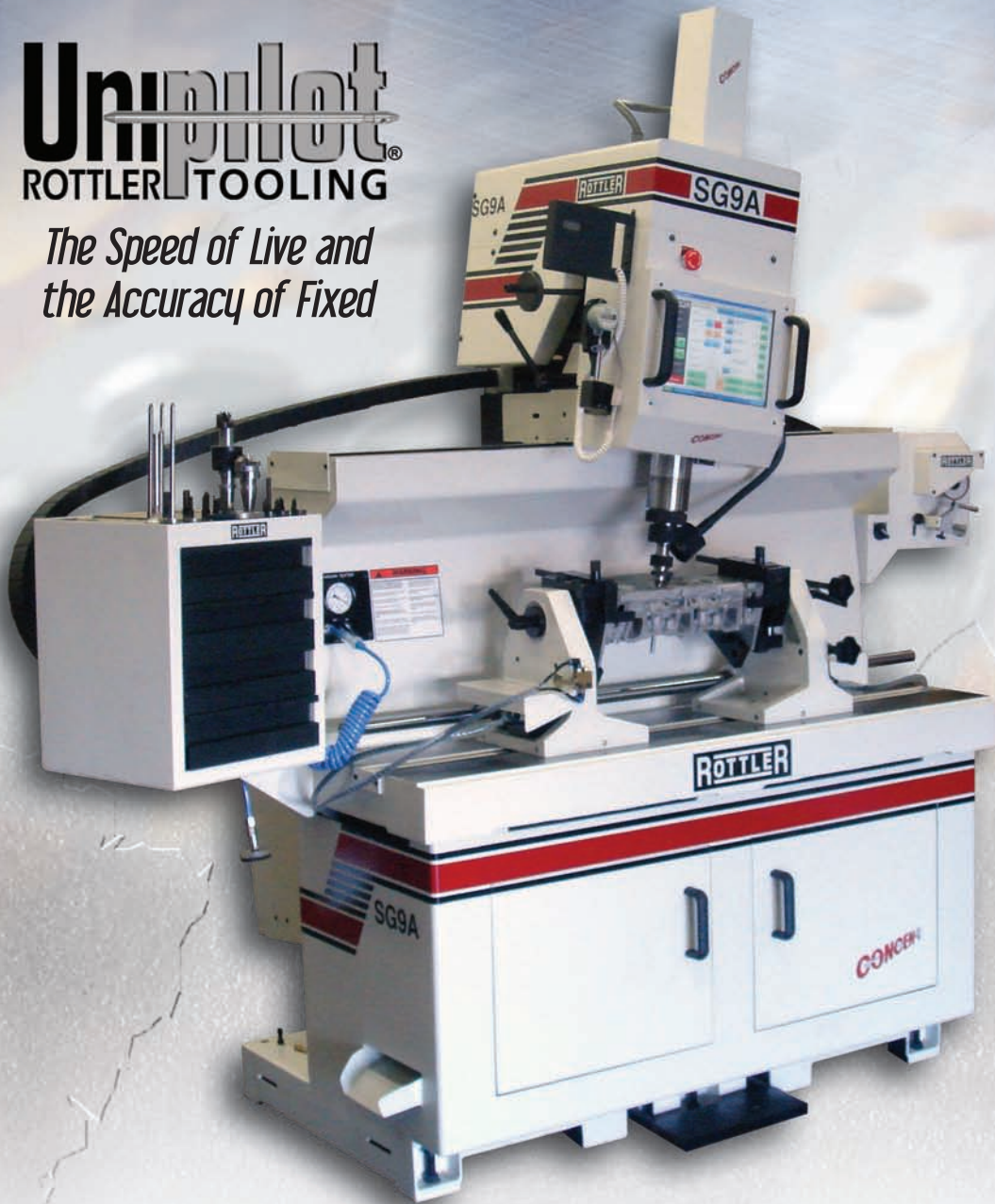


ROTTLER

SG9A CNC Cylinder Head Seat & Guide Machine

Unipilot
ROTTLER TOOLING

*The Speed of Live and
the Accuracy of Fixed*



PERFORMANCE RACING AND ENGINE REMANUFACTURING MACHINERY AND EQUIPMENT

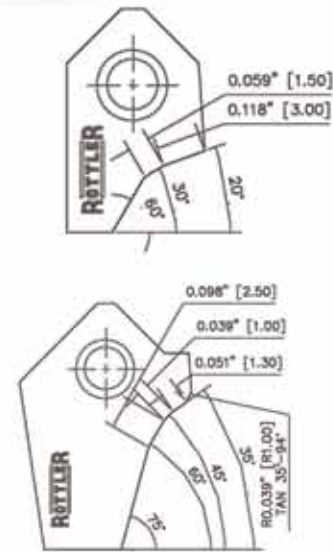
THE CUTTING EDGE

SG9A

Cylinder Head Seat & Guide Machine



Rottler Multi Angle Fine Grain Carbide Cutting Inserts machine the hardest Valve Seat Metals. Many different profiles available ex stock for special applications such as high performance racing, power sports, motorcycle for valve seat diameters as small as 5/8" 14mm. Special Customer Profile Inserts available on order.



Unipilot[®] ROTTLER TOOLING

The Speed of Live and the Accuracy of Fixed



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.



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 SG9A computer such as specification manuals, machining data, etc.

Unipilot[®] ROTTLER TOOLING

Gives Best Concentricity

Rottler's Rigid Precision carbide centering **UNIPILOTS** are manufactured to less than one tenth (.002mm) tolerance. Combined with the light weight air float workhead the SG9A gives perfect centering in the valve guide and the best concentricity of any machine on the market, .0005 per 1 inch of valve diameter (.01mm per 25mm diameter).

UNIPILOT

UNIPILOT

SG9A

Cylinder Head Seat & Guide Machine

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. Cutting tools are substantially faster and less expensive than grinding, where a different grinding stone is required for each angle.

Storage Cabinet

3 Drawers and Top Tray allows convenient storage of wide selection of tooling available from Rottler.

Built in Vacuum Tester

For quick checking of valve seats before removing the cylinder head.

Air Float 360 Degree Rollover Fixture

Provides quick loading and easy access to all sides of the head. Quickly levels head using the micro adjust feature. Clamps onto table firmly for chatter free cutting with extremely accurate concentricity centered by a pedal. Fixture floats on an air cushion for quick, easy setup with both hands.

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 cabinet/base extended to the rear for safe handling when machine has to be moved. Recessed toe kick allows more comfortable machine operation.

Light Weight Workhead

The SG9A has a light weight workhead for fast and accurate centering for the minimum concentricity. At the same time, the workhead is heavy duty capable of machining large diameter valve seats.

Spindle Alignment

Pneumatic system controlled by computer aligns spindle vertically to allow UNIPILOT to easily enter valve guide.

Variable Speed Servo Spindle

CNC Servo Spindle Motor controls final speed and number of dwell revolutions then lifts automatically given perfect surface finish results.

Electronic Level

Digital Readout for quick, accurate alignment for difficult heads such as canted valve guides

15 Degrees Tilt

Spindle tilts up to 15 degrees from vertical in both directions, providing quick alignment on all canted valve cylinder heads. Cuts each seat to the exact same depth - a must for today's computer controlled engines.

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.

Large Diameter Spindle

3.150 inch (80mm) diameter heavy duty spindle assures rigidity for chatter free operation. Outer spindle support bearings are adjustable over the whole length of the bearing area, similar to High Precision Boring Bar design giving decades of use.

Foot Pedal to Control Air Float for In/Out Adjustment of 360 Degree Fixture during cylinder head setup.



Touch Screen Control

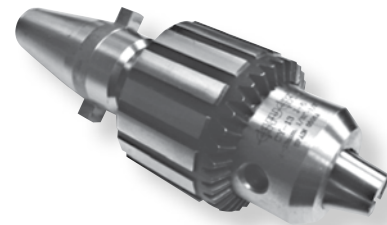
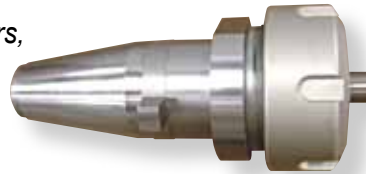
Only buttons and information required for each mode is displayed at one time.



Universal Tooling

Rottler makes an assortment of drivers for our patent pending Unipilot Tooling spindle system. Combined with our wide range of insert/bit holders, valve seats from .550" to 3.25" (14mm to 80mm) and larger can be cut on the SG9.

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.

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.



New from Rottler!
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.



Electronic level for precision leveling of guides (pictured with canted guide fixture).

Diamond Wheel Cutting Insert Sharpener



Rottler offers machine mounted tool sharpener for fast easy sharpening of multi-angle tool bits.

Unipilot[®] ROTTLER TOOLING

*The Speed of Live and
the Accuracy of Fixed*

Rottler's new patent pending **UNIPILOT TOOLING** system allows the carbide centralizing **UNIPILOT** to work like a live pilot – stays in the spindle while moving from valve guide to guide – but at the same time has a fixed pilot design to give improved **CONCEN**.

Fixed (dead) pilots have proven over the years to give more accurate **CONCEN** compared to live pilots mainly because live pilots have clearance between the pilot and the guide. The section of the **UNIPILOT** that fits into the valve guide is straight/parallel but it has a tapered upper area which is spring loaded and fixes in the valve guide while centering to eliminate any clearance between the pilot and the valve guide. After cutting the valve seat, when the spindle is lifted rapidly with the steering wheel, the **UNIPILOT** remains in the spindle and is lifted at the same time ready to be installed in the next guide.

To further improve the speed and ease of inserting the **UNIPILOT** into the valve guide, the spherically mounted **ACTIVE SPINDLE** is held in a vertical position by a pneumatic cylinder. The **UNIPILOT** is also spring loaded which assists inserting the **UNIPILOT** into the beginning of the valve guide. As the operator turns the steering wheel and tries to get the **UNIPILOT** to enter the valve guide, the spring loaded **UNIPILOT** is able to resist and then the spring pressure helps insert the start of the **UNIPILOT** into the valve guide. This system solves a major problem with live pilot machines especially with small diameter pilots below 6mm. The design of today's high performance cylinder heads locates the beginning of the valve guide far away from the valve seat and the operator cannot easily see the start of the pilot entering the valve guide but now the **UNIPILOT** system allows the pilot to enter the valve guide with ease and speed.

What is Active Spindle

The Rottler SG9 spindle is mounted on a sphere which allows the UNIPILOT 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.

What is **CONCEN**

Rottler's trade mark that guarantees that our customers get the most accurate seat and guide machine possible. The combination of Rottler precision carbide centering UNIPILOTS and ACTIVE SPINDLE supported in a light weight air float workhead give perfect centering in the valve guide. This guarantees the best CONCEN of valve seat to valve guide centerline in the industry.



Universal Fixturing



Rottler offers special fixturing for cutting seats in one piece aircraft cylinders.



Rottler's 360 degree rollover fixture allows large, long heads, such as this Jaguar XJ6, to be rolled 360 degrees for multiple operations such as boring cam follow bores and repairing broken exhaust studs by drilling and tapping.



Difficult, Angle and Canted heads like GM 2.0L are easily clamped and Rolled 360 Degrees.



Dual Head Fixture allows a set of V6 or V8 heads to be set up and rolled 360 degrees. Machine all valve seats and valve guides in one set up.



2 piece frame kit allows mounting of overhead camshaft and difficult to mount cylinder heads.

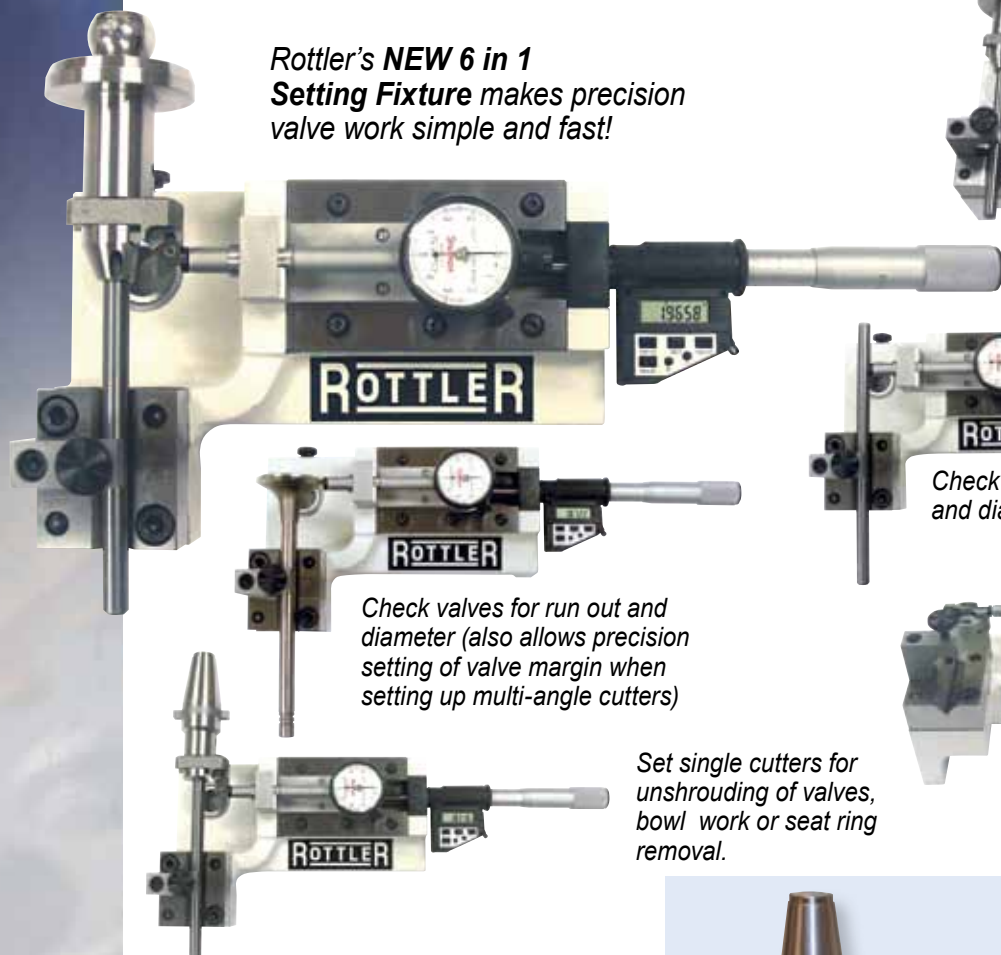


Cat 3406E cylinder head in large diesel head fixture.



Rottler's small to medium diesel head fixture allows fast set up and clamping of in-line cylinder heads.

Measuring Instruments



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

Set multi-angle seat cutters to exact diameter

Check pilots for bend and 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.

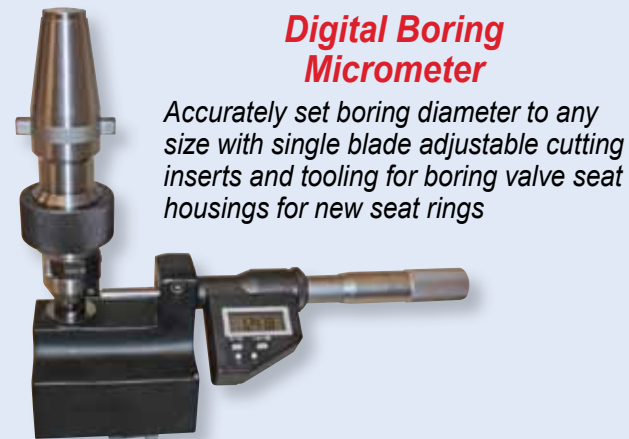
Set seat pocket cutters to proper diameter

Valve CONCENTRIC Measuring Gage



Spring loaded V supports allow valve stem to be rotated around it's own centerline and valve seat run out to be measured with a precision gage .0001" (.002mm) per division. A second dial gage can be used to check that the valve stem has no run out or bend.

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

Valve Seat CONCENTRIC Measuring Gage



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

Standard Equipment

Standard Equipment Includes:

- ACTIVE SPINDLE - Spherical Pneumatic Automatic Alignment System built into the Spindle for fast location of the pilot into the Valve Guide and Accurate Centering (Patent Pending)
- Air Float Work Head with Foot Pedal Control
- Heavy Duty Spindle - Diameter 3.150" (80mm) Hardened and Ground with 8" (200mm) of hand wheel 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
- Work head tilts up to 15 degrees in both directions for canted angle valve guides
- Digital Electronic Level for Quick alignment of Valve Guides and Spindel Centerline
- Universal Heavy Duty Bolt Down 360 degree Roll Over Cylinder Head Fixture - Roll-over fixture air floats on table which makes multi valve set up very easy .
- Holder Kit for heads that Roll Over Fixture is not able to clamp - 2-piece frame - adjustable for different length heads
- Flexible, compact Halogen work light mounted on Work Head
- Tool Storage Cabinet with 3 Drawers mounts on the machine and swivels for ease of use
- Built in Vacuum Tester Kit includes hose and 7 pads



CNC Servo High Torque Spindle Motor allows automated heavy duty cutting for difficult jobs such as boring out valve seat inserts and housings, and drilling, reaming and tapping.

SG9A Specifications

Valve Seat Diameter	.550" - 4.724" (14mm - 120mm)
Maximum Cylinder Head Length (with 360° rollover fixture)	44" 1118mm
Maximum Cylinder Head Length (with diesel fixture)	50" 1270mm
Spindle Diameter	3.150" 80mm
Spindle Speed	Variable to 800 rpm
Maximum Spindle Stroke	8" 203mm
Maximum Tilt (either side of zero)	15 degrees
Distance from Table to Spindle	19.5" 495mm
Maximum Cylinder Head Length (with 360° rollover fixture)	40" 1270mm
Maximum Cylinder Head Length (with optional fixture)	Unlimited
Electrical Requirements	208/220 volt, single phase, 15 amp, 50/60 Hz
Air Requirements	90/100 psi 6 Bar
Spindle Motor	5 HP/3.75 kW CNC Servo
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	61" wide x 25" deep x 75" high 1549mm x 635mm x 1905mm
Shipping Weight	2800 lbs 1258 kg

Specifications and design subject to change without notice.

Optional Equipment

Part Number	Description
Rottler UNIPILOT Tool Holders for use with UNIPILOTS SG9 & SG9A only	
UPT5100	UNIPILOT Toolholder (Patent Pending), range 0.787" - 2.360" (20 - 60mm) with TH2000-2002 (for 3/8" 9.52MM Shank UNIPILOT system)
UPT5300	UNIPILOT Toolholder (Patent Pending), range 1.570" - 3.150" (40mm - 80mm) with TH2003 - 2004 (for 3/8" 9.52MM Shank UNIPILOT system)
Rottler Live Pilot Tool Holders for use with Live Pilots SG9 & SG9A only	
R5000CL1	Toolholder, range: .551" - .866" (14mm-22mm) with TH1999 (for 6.00mm Shank Live Pilots)
R5100CL1	Toolholder, range 0.787" - 2.360" (20mm - 60mm) with TH2000-2002 (for 3/8" 9.52mm Shank Live Pilots)
R5300CL1	Toolholder, range 1.570" - 3.150" (40mm - 80mm) with TH2003-2004 (for 3/8" 9.53mm Shank Live Pilots)
Tip Holders For Multi Angle Valve Seat Cutting (using RCA630 Insert - minimum diameter will vary with other inserts/tips)	
TH1999	Tip Holder, Range with UPT600 Unipilot and R5000CL1 Toolholder: .570" - 1.250" (14.48mm-33.52mm) Cutting Insert for minimum range)
TH2000	Tip Holder, Range with UPT5100 Unipilot or R5100CL1 Toolholder: .800" - 1.395" (20.32mm - 35.43mm) Cutting Insert for minimum range)
TH2001	Tip Holder, Range with UPT5100 Unipilot or R5100CL1 Toolholder: 1.00" - 1.800" (25.4mm - 45.72mm)
TH2002	Tip Holder, Range with UPT5100 Unipilot or R5100CL1 Toolholder: 1.190" - 2.200" (30.22mm - 55.90mm)
TH2003	Tip Holder, Range with UPT5300 Unipilot or R5300CL1 Toolholder: 1.270" - 2.360" (32.26mm - 60mm)
TH2004	Tip Holder, Range with UPT5300 Unipilot or R5300CL1 Toolholder: 1.850" - 3.150" (47mm - 80mm)
TH2005	Tip Holder, Range with UPT5300 Unipilot or R5300CL1 Toolholder: 2.625" - 4.724" (66.7mm - 120mm) Special order
Cutting Inserts/Tips	
Rottler has a wide range of Multi and Single Angle Cutting Inserts for all applications. Special profile inserts are available on order.	
Cutting Insert Sharpener for Multi Angle Inserts	
BWS02	Diamond Wheel Cutting Tip Sharpener
Tip Holders for Valve Seat Housing Counterboring using Rottler RT211 & RT212 Triangular Boring Inserts	
TH2000-00	0 Degree Triangular Insert Tip Holder. Range with UPT600 or R5000CL1 .1.055"-1.400" (27mm - 36mm) with UPT5100: 1.27"-1.58" (32mm - 40mm)
TH2001-00	0 Degree Triangular Insert Tip Holder. Range: 1.100"-1.570" (28mm-42mm) with UPT5100 or R5100CL1 Toolholder.
TH2002-00	0 Degree Triangular Insert Tip Holder. Range: 1.600" - 2.458" (40.64mm - 60.43mm) with UPT5100 Unipilot or R5100CL1 Toolholder.
TH2003-00	0 Degree Triangular Insert Tip Holder. Range: 1.640" - 2.200" (41.65mm - 55.88mm) with UPT5300 Unipilot or R5300CL1 Toolholder.
TH2004-00	0 Degree Triangular Insert Tip Holder. Range: 2.220" - 2.850" (56.38mm - 72.40mm) with UPT5300 Unipilot or R5300CL1 Toolholder.
TH2005-00	0 Degree Triangular Insert Tip Holder. Range: 3.160" - 4.000" (80.26mm - 101.60mm) with UPT5300 Unipilot or R5300CL1 Toolholder. Special Order. 10, 20, 30, 35, 45 degree Single Angle Triangular Insert Tip Holders available.
Fixed Diameter Double Cutting Insert Milling Heads for Valve Seat Housing Counterboring	
FMH	Fixed Double Replaceable Insert Milling Heads - Counterbore diameter 1.00" - 2.375" available in increments of 1/16" (.125") (Requires Milling Head driver)

Part Number	Description
RS105	Milling Head Driver for Fixed milling head cutters for .625" ID milling head body.
RS560	Milling Head Driver for Fixed milling head cutters for .562" ID milling head body.
Universal Tooling for Rottler R1 Spindle Taper	
SAD500R1	Spindle Adapter for 1/2" (12.70mm) Shank Diameter Tools, reamers, drills, etc includes 2 locking set screws
SAD375R1	Spindle Adapter for 3/8" (9.525mm) Shank Diameter Tools, reamers, drills, etc includes 2 locking set screws
R1MT2	Spindle Adapter for Morse #2
R1MT3	Spindle Adapter for Morse #3
PC375R1	Universal 3-Jaw Chuck including Spindle Adapter
COLLET-KITR1	Collet Chuck Kit including retaining nut, wrench and range of collets.
Micrometers Setting Fixtures & Measurement Tools	
DSP	Tool setting Device with Interchangeable Point
BM	Boring Micrometer, Digital Reading Inch and Metric (.800" - 2.80") for .375" (9.52mm) and 6.00mm (152.40mm) shank toolholders
6-1SETTINGFIX	6-in-1 Measuring Fixture (Pilot Dia, Valve Stem Dia, Set Dia. of multi angle inserts, Set counterboring insert dia, Set adjustable milling head cutters, Check valves and pilots for bend).
VSG102-375	Precision Valve Seat Concentricity Gage for .375" 9.52mm Pilot Shank (Must Order .0001" or .002mm dial indicator)
VSG102-6mm	Precision Valve Seat Concentricity Gage for 6.00mm Pilot Shank (Must Order .0001" or .002mm dial indicator)
502-11-39L	Dial indicator (.002mm resolution) METRIC
502-11-39D	Dial indicator (.0001" resolution) INCH
Special Fixtures, Clamps and Parallels	
DUALHEFIXT	Center Cradle support system for dual V6/V8 cylinder head clamping
DIESELFIX	Diesel Fixture for large in line cylinder heads, includes 1 pair Parallels 12" X 6" (305mm X 152mm) Requires 1 set Clamp Towers 7242T
7242T	Set of 2 Low Profile Clamp Tower assembly
650-3-34	2-1/2" (63.50mm) wear pads, 1 pair (For large cylinder heads using Clamp Tower 7242T to hold the hold the Cylinder Head)
7618	Large Cylinder Head Clamping Fixture (CAT 3406E, Detroit 60 series, etc)
CANTEDFIX	Canted Fixture for leveling Canted cylinder heads on any fixed pilot Seat and Guide Machine
Miscellaneous Tooling	
CDR312	Combo Core drill / Reamer .312" Pilot with .375" diameter Shank to bore for standard 1/2" OD valve guides
CDR343	Combo Core drill / Reamer .343" Pilot with .375" diameter Shank to bore for standard 1/2" OD valve guides
CDR375	Combo Core drill / Reamer .375" Pilot with .375" diameter Shank to bore for standard 1/2" OD valve guides
VSD100-Kit	Valve Seat Driver Kit Includes: Seat Driver Body, 5 Dual seat Ring Adapters, 5 Solid Tapered Pilots
VGD-Kit	Valve Guide Driver Kit including .312", .343", .372" and 7mm Valve Guide Drivers (requires air hammer - not available from Rottler)
VGTC-Kit3	Valve Guide top cutter Kit with 1/2" straight Shank include 5/16", 11/32" & 3/8" pilots

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