

**ROTTLER**  
THE CUTTING EDGE

# P69AHD

## 5 Axis Multi Purpose CNC Machining Center



Digitizing,  
Programming and  
Porting Cylinder  
Heads and  
Manifolds



Machining Equipment  
Created for Performance  
Racing & Engine  
Remanufacturing.

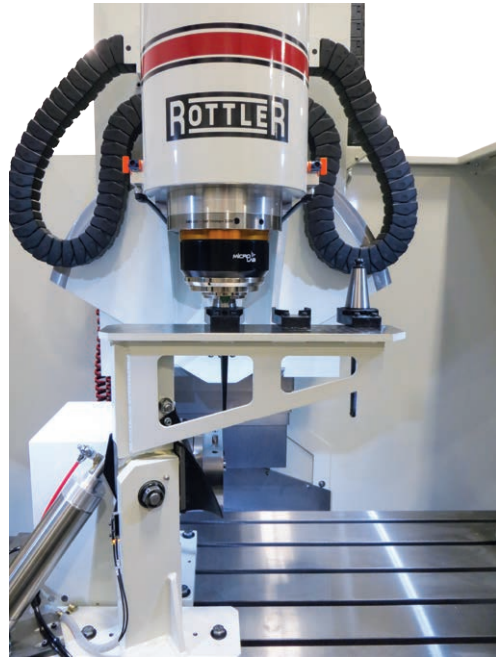
So Advanced, It's Simple.

Machine Engine Blocks – Boring,  
Surfacing, Line Boring, Lightening  
and much more....

# P69AHD 5 AXIS MULTI PURPOSE CNC MACHINING CENTER

## 5TH Axis Spindle Motor Locking Brake

The 5th Axis has an automatic built in brake that locks the spindle motor in position for heavy cutting operations such as cast iron engine block boring and surfacing plus heavy cutting when manufacturing parts from solid billet.

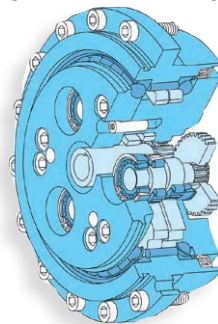


## High Torque Spindle Motor

The High Torque Spindle Motor offers substantially increased torque and power to cut massive ductile cast iron cylinder heads much faster yet will still run 10,000RPM for fast cutting of aluminum cylinder heads.

## Rotary Vector Gear Reducers

Rotary Vector Gear Reducers (or Cycloidal gear drive) give less than 1 arc/min on the 4th and 5th axis, reducing wear, extending life and boasting near zero backlash. This ensures perfect blending where tool paths meet inside the port. They also incorporate angular contact bearings for greater load bearing support.

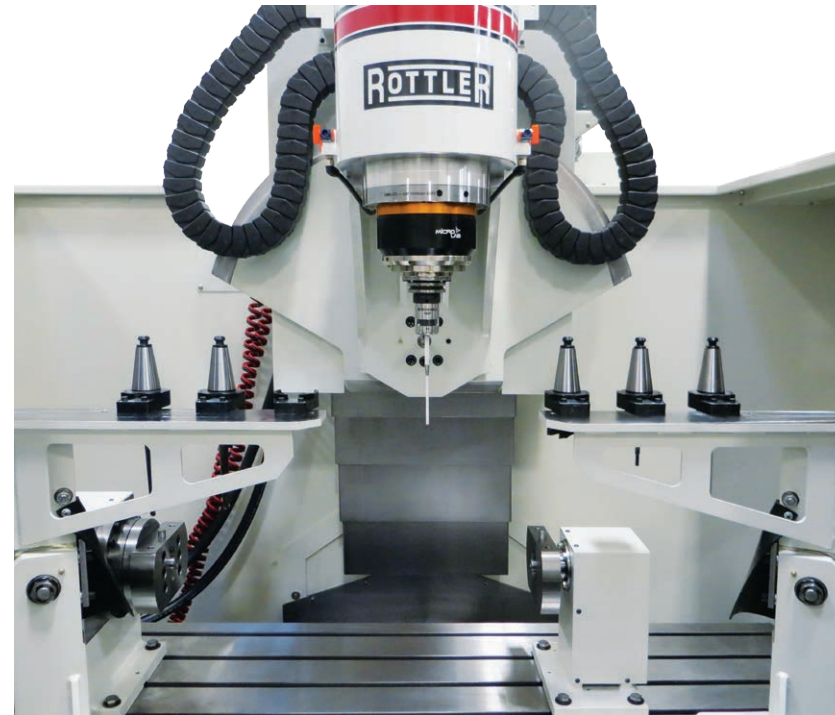


## Precision Machining

The P69AHD has fast rapid movements and cutting speed with infinite look-ahead capabilities. A common V8 head can be ported in as little as 1.5 hours – intake, exhaust and combustion chamber. Our high speed spindle is built directly into the 5th axis of the machine with the center of the cutting tool on the same center as the 5th axis to increase speed and accuracy. The 5th axis is capable of tilting 60 Degrees in each direction for a full 120 degree range of motion.

## Automatic Tool Changer

Rottler's P69AHD has 2 optional ATC Automatic Tool Changers – each holds 3 CAT40 tools, to allow the operator to use tools specifically designed to cut combustion chambers or cut the area around valve seat rings along with different length lollipop tools for those hard to reach areas in the port. This gives the operator the ability to walk away and come back when head is completely finished.



## 5th Axis is Center of Ball Cutter

Allows +/- of 60 degrees on 5th axis to access all port geometry. X axis does not chase the 5th axis motion making the P69AHD extremely accurate and ports identical.

## BISS Encoders

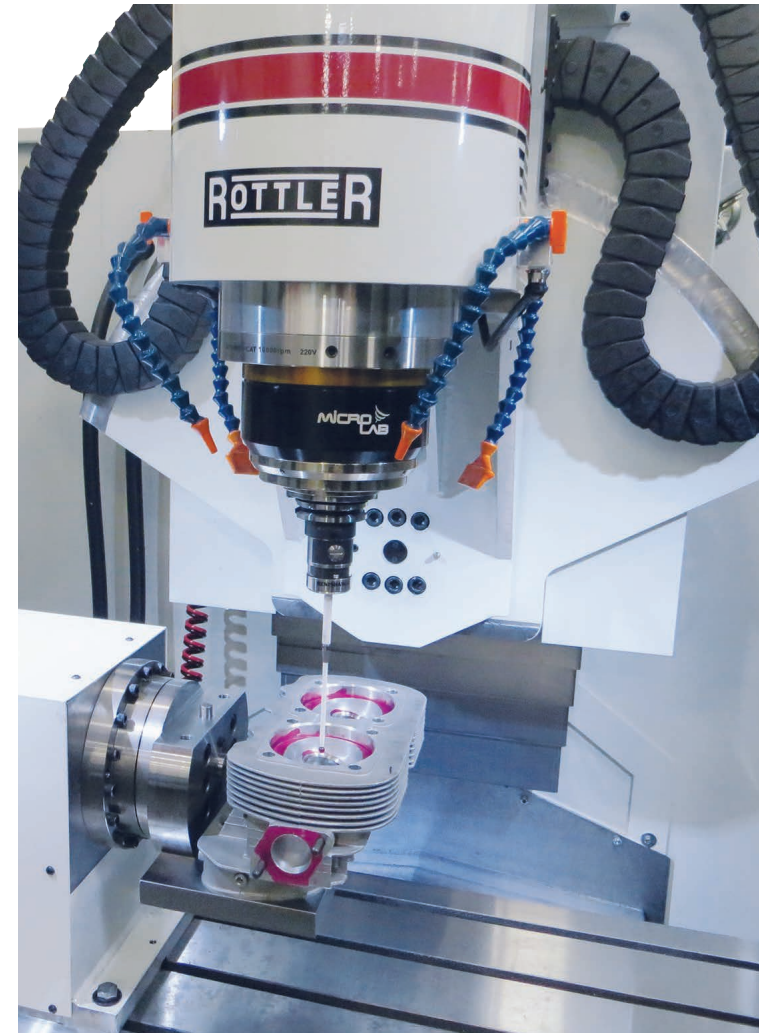
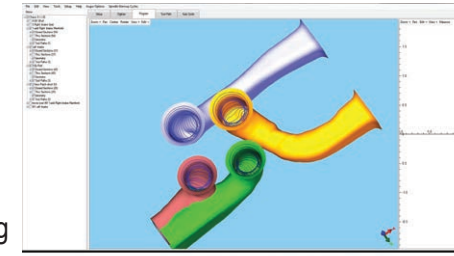
The new technology servo motors have BISS encoders which offer higher resolution for increased accuracy. BISS encoders eliminate any limit switches and do not require homing at start up saving time and increasing reliability.

## Large Spindle Taper

CAT40 spindle taper gives more rigidity and allows faster machining time and improved surface finish

## Windows Touch Screen Control

Allows the end user to jog between machine functions easily via touch screen. The software is context sensitive meaning only actions required by the current job are visible. This reduces learning curve and clutter on the screen. Like other elements of the software, available actions can be modified for specific customer needs.



## Coolant Nozzles

Convenient coolant nozzles allow for a flood of coolant in the hard to reach areas that prevent clogging of cutting tools.

## Large Coolant Tank with Rollers

Large 35 gallon (132 liter) coolant tank rolls out the front of machine for easy fast cleaning.

## Chip Auger

Automatically removes chips from enclosure and deposits them in wheeled disposal cart.

## PC Based Single Processor Control System

Highly interactive and very responsive there is no communication lag between the user interface and the machine. The P69 is able to perform complex and sophisticated functions that are only possible within PC.

## Near Zero Backlash on XYZ Axis

Overall accuracy allows operator to accurately match the hand ported sample and ensures ports will line up with no steps. **No hand work necessary!**

## Direct Drive Ball Screws

Direct drive ball screws on XYZ axis offer near zero backlash for more accurate machining of heads and accurate positioning eliminating backlash problem

## Servo Motors with BISS Encoders

The P69AHD has the latest technology servo motors with BISS encoders offering 100 times finer resolution compared to previous models. BISS encoders eliminate any limit switches and do not require homing at start up saving time and increasing reliability.

## Digitizing Probe

Our automatic digital probing feature utilizes the industry standard Renishaw Radio probe. Our Windows based intelligent software will save digitizing time by mapping the port without a predefined template which eliminates the time consuming process of probing the port multiple times for accuracy. Other systems typically require a predefined template which can only be acquired by digitizing the same port multiple times.

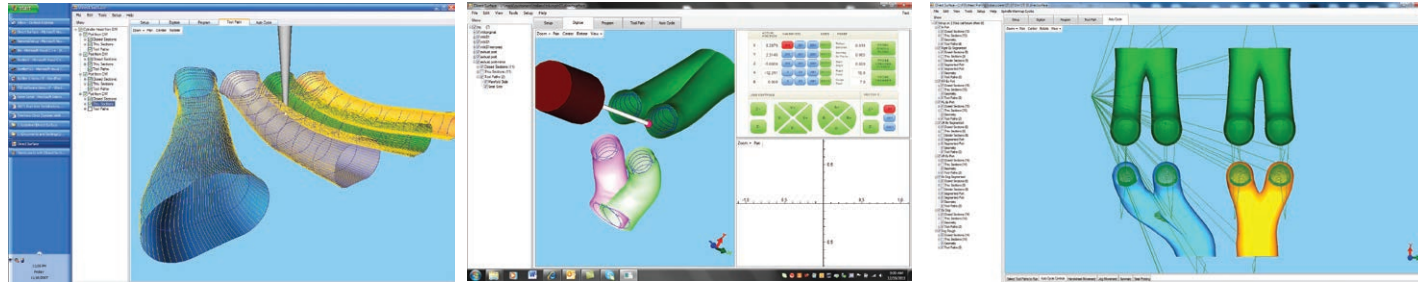
Rottler Software digitizes in full 5 axis simultaneously producing "clean" data with no requirement to manually delete data where the probe "shanked out." Once you digitize with your P69AHD, the data is ready to run a port. The machine operator is able to digitize and duplicate a port in 30 minutes without the added hassle of expensive CMM required by the competition.

## Engraving

Logos and additional info can be engraved on the side of cylinder head during porting process.

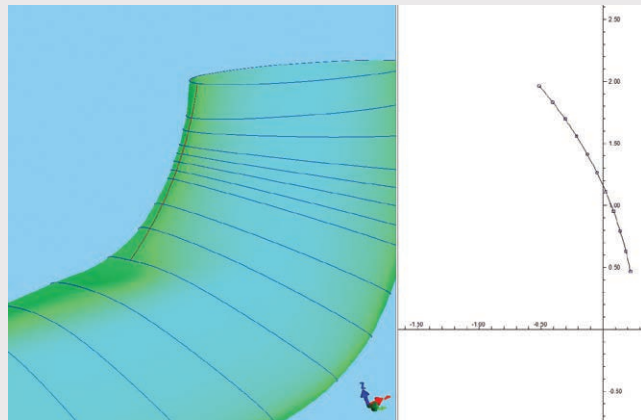


# SOFTWARE & BENEFITS

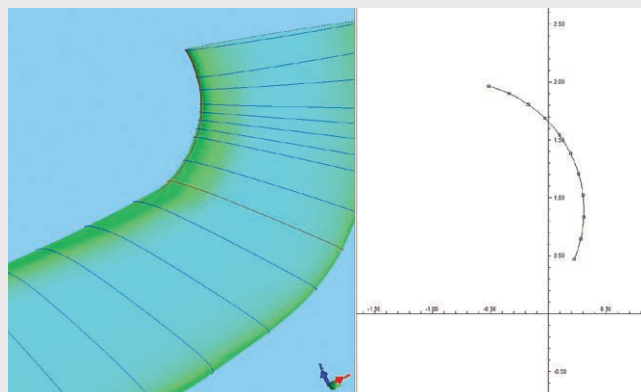


## 3D Arc Feature

The 3D Arc Feature allow operators to program an arc "through" the port and "around" the port. This is especially useful in the short turn of a port to mathematically define critical shapes. Using these features, changes to the 3D port can be made in seconds and is a useful tool in helping to develop the maximum flow in a port.



Arc with large radius



Arc with small radius

**It takes seconds to change the port between these two shapes and the machine is ready to run.**

The Rottler P69AHD 5 axis CNC head porting machine is a revolutionary comprehensive solution. Our user friendly touch screen Direct Surface software handles the entire porting process from start to finish. No outside software tools are needed, drastically reducing the learning curve and time spent on training.

## Advanced Rottler Software Allows Operator to View Cross Sectional Dimension of Port Area and Volume

Software can calculate cross section area to ensure that actual cross section area is calculated as port shape changes

With P69AHD software why hand port the first head? You can digitize the cast head and then use P69AHD software to modify ports rather than grinding by hand.

Beautifully machined ports are accurate to **one thousandth of an inch** and require no hand work. Rottler's advanced port manipulation tools allow quick and easy "at the machine" modification of three dimensional data.

## Advanced Direct Motion Software Tools

Allows manipulation of port design and minimizes digitizing time. This allows operator to pick up data once and modify the design on the screen. Operator can modify hand ported design if necessary.

## Standard PC Hardware and Software

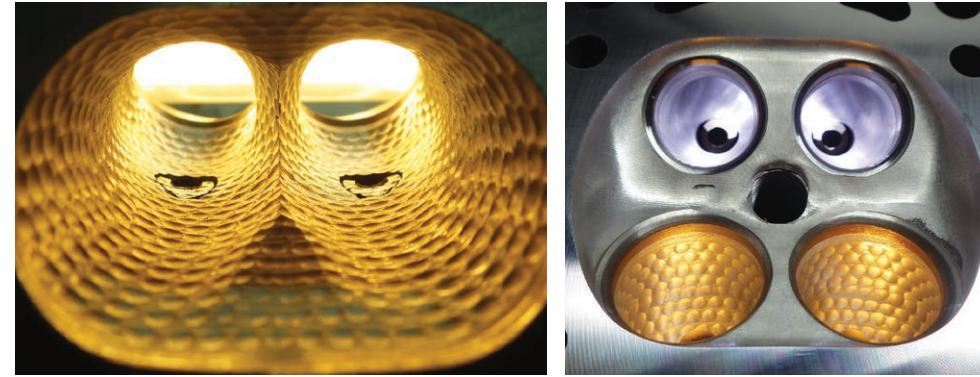
Offers the highest performance, can be networked, easily upgradeable and repairable.

## All Inclusive Flexibility

Our all-inclusive system ensures that the end user never has to transfer design data from computer to computer or convert data between separate software programs saving time and avoiding hassle.

Our versatile software allows importing and exporting of designs between most common CAD/CAM software programs. This means Rottler customers are able to utilize previous knowledge and experience if familiar with another program such as Surf Cam or MasterCam.

# EXCLUSIVE DIMPLING FEATURE



Customers using the unique Rottler software are able to dimple ports in certain areas reporting a 1½ - 2% increase in horsepower of non-dimpled ports. Not only are you gaining horsepower but you are preventing your competition from copying your exact port.

## Exclusive Dimpling Pattern

Do you know why golf balls have dimples? To make them fly farther! By dimpling the surface of a golf ball you eliminate surface area thus reducing drag of the air across the ball. By dimpling a port in the cylinder head you can also reduce drag of the air going across the face of a port thus improving airflow. In tests of identical cylinder heads bolted on the same short block the dimpled ports reported an increased in horsepower on the dyno over heads that weren't dimpled.



*We purchased a Rottler P69 about 4 years back and are very happy with the complete turn-key package from the beginning. The demo and sale were great, the installation and training were excellent and we were digitizing and porting heads after only 2 days! The software is amazing – digitizing and programming is so fast that we can do 1 off heads much faster than hand porting. We can easily do advanced things like design our own port shapes and measure things like volume and cross section area. Our machine has done hundreds of heads and has proven to be very reliable without any problems. The Rottler service and support is excellent!*

*We recently ordered a new P69AHD and are excited to soon be using the increased spindle torque for more advanced and complicated projects like manufacturing our own new heads. We also ordered a SG9HP and VR12 so that we will have the best machinery available to produce our championship winning cylinder heads."*

**–Tony Bischoff, BES Racing Engines, Guilford, Indiana, USA**

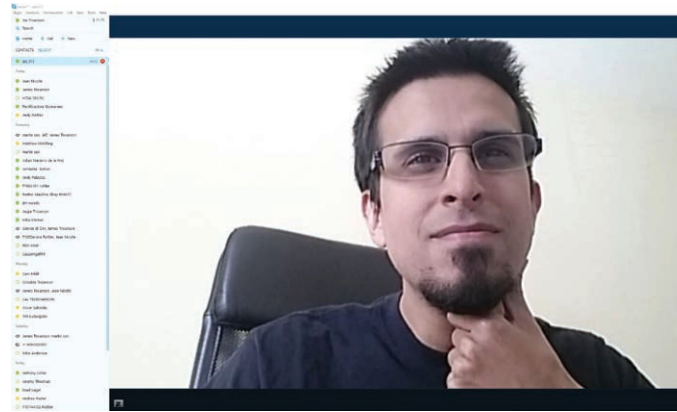
# PORT WORK EXAMPLES DONE ON THE P69AHD MACHINE



## Internet Support

Rottler offers cutting edge internet support direct from your machine to the factory. Our cutting edge internet support even enables us to "Log In" and remotely control your machine from our factory if necessary.

Shop too busy or noisy for talking? The pre-installed Skype™ application gives you instant messaging capabilities with Rottler Factory Technicians.

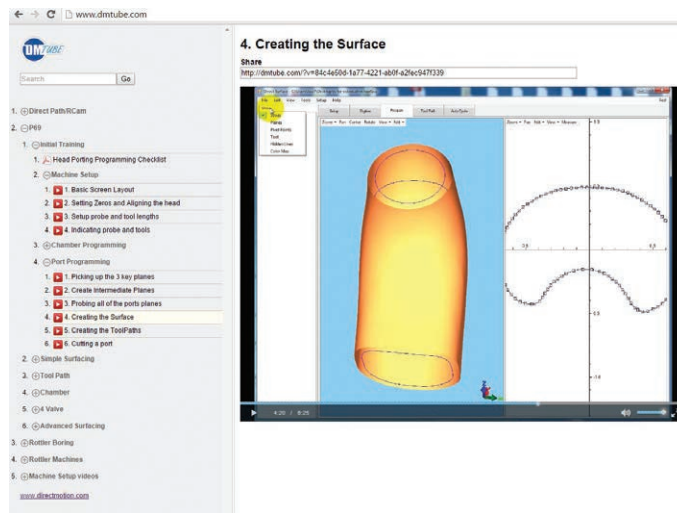


## Video Chat and Instant Messaging

Skype™ and a webcam are installed on the P69AHD for video conferencing, instant messaging and internet support. This feature gives you instant, direct contact with Rottler right on the machine without even making a phone call. The standard webcam comes pre-installed so that Rottler technicians can see exactly what you are seeing. This saves a tremendous amount of time when trying to answer questions.

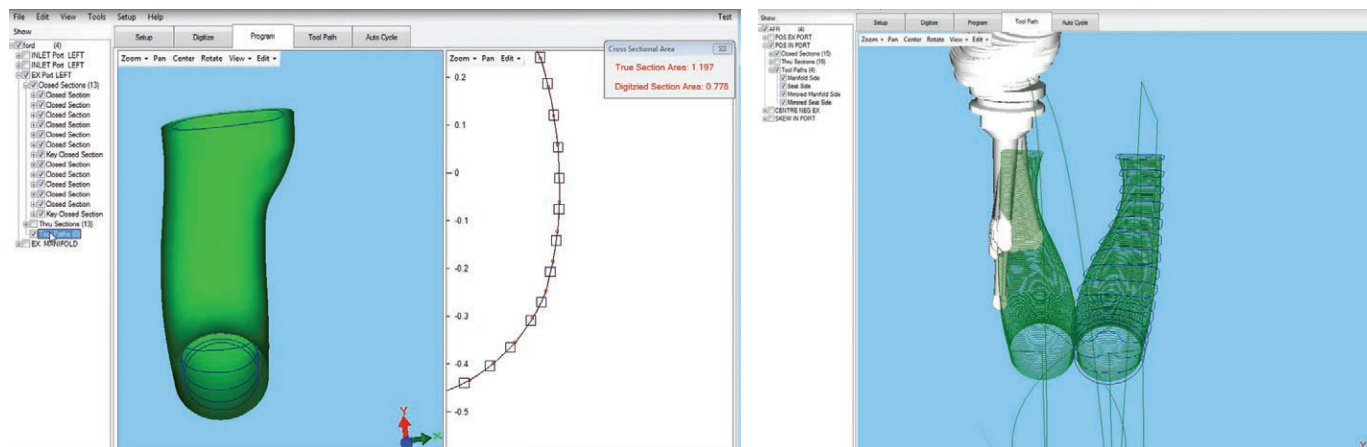
[www.rottlertube.com](http://www.rottlertube.com)

An extensive library of video tutorials is available online 24 hours a day. Many customers find that they can get quick answers to their questions regarding the P69AHD with the use of this library without even contacting Rottler for support. Tutorials are added with each software enhancement.



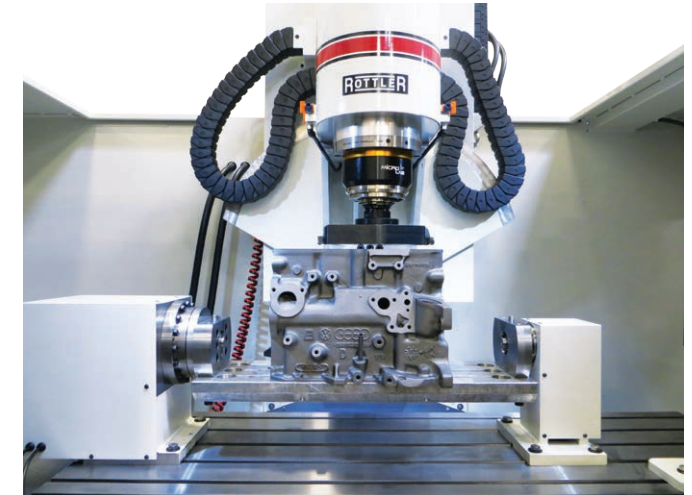
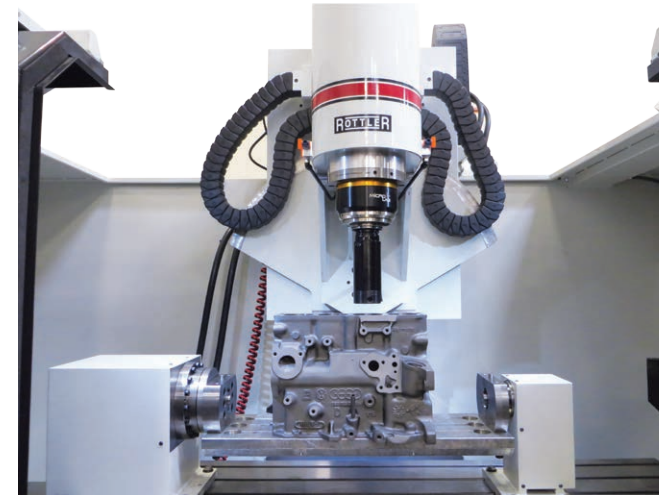
## Free Software and Functionality Updates

All Rottler P69AHD machine owners receive free software updates for the life of the machine. Whenever there is new software or functionality the customer receives an automatic, free update. There are no buy-in costs or maintenance fees typically associated with CAD programs.



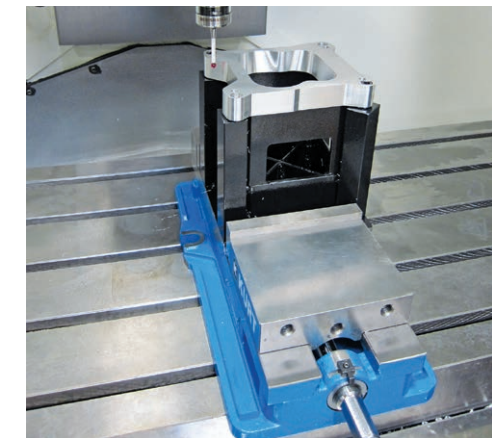
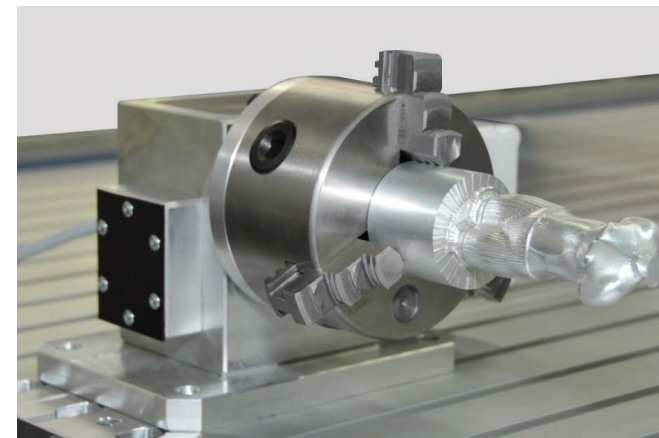
Examples of screens from training videos

The Heavy Duty High Torque Spindle Motor with 5th Axis Brake allows Cast Iron Engine Blocks to be machined. Operations such as probing, boring, surfacing, O-Ring grooving, chamfering and general CNC machining can be done.



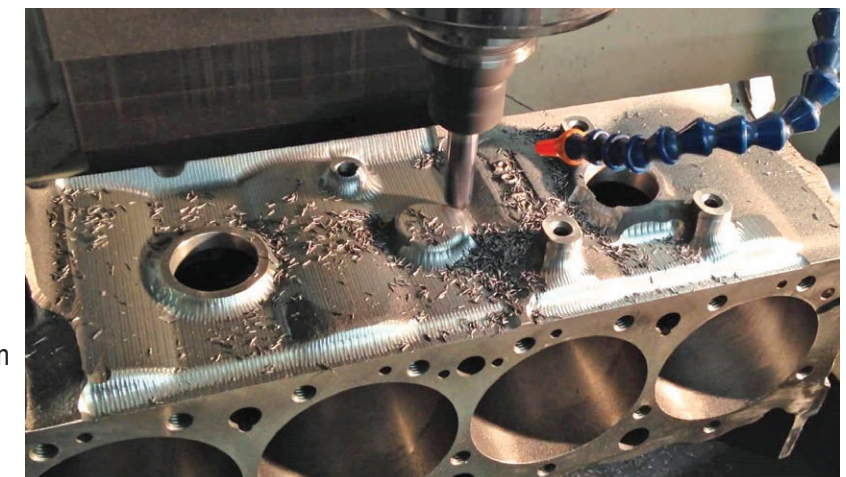
## MULTI PURPOSE CNC MACHINING CENTER

Create all kinds of parts using Rottler CAM (Computer Aided Manufacturing) – cylinder heads from billet or casting, manifolds, spacers, adapters, impellers, carburetor and throttle body – make anything you can imagine!



## CNC Lightening

Lightening parts such as blocks and main caps requires simultaneous movement of 4 or 5 axes for complete lightening programs. The P69AHD is able to complete advanced block lightening for maximum weight reduction.



# STANDARD EQUIPMENT

- Heavy Duty 12ft.lb (16Nm) High Torque Liquid Cooled Integral CAT40 Taper Spindle Motor
- **Standard Software System included with the machine:**
- Port and Chamber CAD/CAM software to quickly manipulate port dimensions, view cross section area, calculate volume, create surfaces, create tool paths and machine ports and chambers. Requires CNC program - either ADP-PROBE digitizing system or Rottler CAM as detailed below.
- After an order is placed, the training videos on [www.RottlerTube.com](http://www.RottlerTube.com) must be studied before Rottler training technician travels to the machine for onsite training. Operators must continue to view these training videos after training to keep up to date with operation of the control and up to date with the latest features.
- Internet connection to the machine computer must be provided and connected at all times during the use of the machine. This is required for service support. The control sends information to Rottler service department.
- Customer must have laptop with videocam for software and programming support.
- Highly Interactive & Very Responsive PC Based Single Processor Control System by Direct Motion Control Technology
- Standard Windows User Interface with Animated Training & Remote Diagnostics
- CNC Touch Screen Control, Windows Operating System with Intel Processor, Networking and Internet Connection included.
- Internet enabled with the ability for a technician to "take over" the machine for remote training and diagnostics from anywhere in the world
- Programming and Machine Operating through 19" (500mm) extra bright touch screen
- Precision Digital Readout, .0001" (.002mm) Resolution
- Accuracy ensures Ports will Line Up with No Step - No Hand Blending Required
- 120 Degree Range of Motion on 5th Axis
- Custom Specialized Cutters and Tool Holders Minimize Run Out, Chatter, Noise, Clogging
- High Spindle Speeds (up to 10,000 RPM)
- High Feed Rates of 100 IPM (2.5MPM) with Integrated Design & Sophisticated Look Ahead Software
- Rotary Vector Gear Reducers in 4th and 5th Axis for extended life and near zero backlash
- Direct Drive AC Servo Motors on all 5 axis - no belts
- Servo Motors with BISS Encoders
- Fully Enclosed with Sliding Doors and Coolant System with chip auger and roll out chip cart

## P69AHD SPECIFICATIONS

MADE IN U.S.A.

	AMERICAN	METRIC
Length Capacity (cylinder head)	43"	1054mm
X Travel	40"	1016mm
Y Travel	20"	508mm
Z Travel	24"	610mm
5th Axis Rotation	120 degrees - 60 degrees either side of vertical	
Spindle Taper	CAT40	
Spindle Rotation	0-10,000 RPM	
Spindle Motor Torque	12 Ft.Lb	16Nm
Table Size (5 T-Slots)	20" x 59"	508mm x 1498mm
Rapid Travel X, Y, Z Axis	540 ipm	11.4 mpm
Feed Rate	0 - 100 ipm	0 - 2.54 mpm
Electrical requirements	208/240V, 50A, 3PH, 50/60Hz	
Air Requirements	90-100 psi	6-6.6 BAR
Machine Weight	12,500 lbs.	5670 kg
Shipping Dimensions	93" x 135" x 101"H	2,3m X 3,4m X 2,56mH
Paint Color Code	RAL9002 (Grey White)	

Specifications and design subject to change without notice.

May 2016

[www.rottlermfg.com](http://www.rottlermfg.com)

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