

# Absolute Service



Headquarters-Lorain, Ohio

**ABSOLUTE  
MACHINE TOOLS**

GO WITH THE **A**-TEAM



Technical Center-Mason, Ohio



Technical Center-Livonia, Michigan

Absolute helps machine shops and manufacturing facilities improve their production processes to be more competitive in today's tough global environment. For 30+ years, the company has built its reputation on unsurpassed applications engineering support, after-sale service and training, and invaluable Preventive Maintenance Programs (PMP) and services.

Absolute believes that finding the right machine tool supplier is just as critical to the metal cutting process as securing the right machine. Today, machine tool suppliers are more like solutions providers in helping companies engineer solutions that deliver profitable results for their production and applications processes. We work closely with tooling companies and software developers to ensure that tooling and software truly optimize machine performance. We also offer the most innovative Preventive Maintenance Programs in the industry. These programs allow us to help manufacturers increase machine tool productivity by increasing output efficiency, uptime, and profit margins, while avoiding expensive repairs and costly downtime.

Contact Absolute Machine Tools by calling 800-852-7825 or email [service@absolutemachine.com](mailto:service@absolutemachine.com) to learn how our comprehensive Preventive Maintenance Programs can help your business boost productivity and increase profitability!



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**Preventive Maintenance  
& Service Programs**



## Level and Square Alignment

### Faro

Absolute has added the **Faro ION Laser Tracker** to their metrology equipment list. The Faro can be used for in-line measurements, high speed dynamic measurements, and high accuracy machine calibration. ION's internal Absolute Distance Meter (ADM) and Interferometer are the most sophisticated and accurate lasers used and can accomplish scanning even when the target is in motion. This coupled with the Faro CAM2 software allows our technicians to calibrate your machine and generate reports showing you the exact machine geometry and positional accuracy in a true 3D environment.



### FARO's Distance Measurement Performance:

#### ADM

Resolution: 0.5µm  
Sample Rate: 10,000/sec  
R0 Parameter (MPE): 16µm  
Range: 0-55m

#### Interferometer

Resolution: 0.158µm  
Accuracy (MPE): 4µm + 0.8µm/m  
Max. Radial Velocity: 4m/sec  
R0 Parameter (MPE): 16µm



#### Angle Measurement Performance

Angular Accuracy (MPE): 20µm + 5µm/m  
Max. Angular Velocity: 180°/sec  
Precision Level Accuracy: +/-2 arc seconds

### Hamar

Absolute Machine Tools uses its own **Hamar L-743 Triple Scan Laser Alignment System** to measure a machine's surface flatness, squareness and straightness. This system is also equipped with a tool that allows us to fix alignment problems in a fraction of the time needed with conventional tools. The L-743 Triple Scan Laser Alignment Tool typically allows you to check the entire machine with one setup, before you begin an alignment. This quick analysis, where every part of the machine is checked to the same coordinate system, assures that stack up errors are reduced and all alignment problems are quickly identified.

- The Hamar L-743 laser features the flattest laser plane in the world that is flat to 1/2 an arc second (0.00003"/ft or 0.0025 mm/m) in a 360° sweep and 1/4 arc second in a 90° sweep (0.000015"/ft or 0.001 mm/m)



## Pitch Error Compensation

Absolute Machine Tools also offers pitch error compensation measuring and reporting for any CNC machine tool. Measuring and calibrating motion systems (linear) on CNC machine tools is critical for accuracy and finish resulting in quality parts production. Absolute uses the **Renishaw XL-80 Laser Interferometer** to measure linear accuracy assured to ±0.5 ppm. Readings can be taken at up to 50 kHz, with a maximum linear measurement speed of 4 m/s and a linear resolution of 1 nm, even at maximum speed. All measurement options (not just linear) are based on interferometric measurements, giving confidence in the accuracy of the data recorded. We also perform Circular Pitch Error Compensation measuring and reporting of rotary axis positioning using **Renishaw's XR-20-W Rotary Axis Calibrator**. Rotary axis compensation is vitally important to machine tool accuracy, such as rotary tables and spindle axes, resulting in ultimate profitability. Measurement accuracy of ±1 arc second is achieved.

### Pitch Error & Circular Measuring Features/Benefits:

- Laser frequency accuracy ±0.5 ppm (parts per million) over 3 years is achieved by thermal control of the laser tube's length to within nanometers.
- Linear measurement accuracy ±0.5 ppm over the whole environmental range i.e., from 0°C - 40°C (32°F - 104°F) and 650 mbar - 1150 mbar. Readings can be taken at up to 50 kHz, with a maximum linear measurement speed of 4 m/s and a linear resolution of 1 nm; even at maximum speed.
- Integrated USB means there is no requirement for a separate laser-to-PC interface.
- XR-20-W measures accuracy of ±1 arc second in rotary axis positioning.



## Ballbar Circularity Inspection & Tram Testing

Absolute Machine Tools has been offering ballbar testing for many years using the **Renishaw QC20-W Ballbar System**. Ballbar testing is important when cutting a circle. The measurement of the circle after it is cut may not exactly match the path that was programmed into the CNC due to inaccurate machine geometry, servo error, and/or wear of the machine tool. These problems can result in the actual cut shape of the circle to deviate from the programmed path. The ballbar testing system accurately measures the actual circular path and compares it with the programmed path which allows our technicians to quickly pinpoint the mechanical or electrical problem with the machine tool, and recommend corrective action.

### Circular Inspecting & Tram Data Analysis Includes:

- The customer has a choice of several report formats according to international standards (e.g. ISO, ASME) and comprehensive Renishaw diagnostics (including volumetric analysis) with a number of different screen views and links to the online help manual.
- Many reports can be customized and the final results used for written reports using the built-in "cut and paste" facility.
- Ensure accurate parts, first time, from CNC machines.
- Reduce machine down-time, scrap and inspection costs.
- Demonstrate compliance with machine performance and quality management standards.
- Implement fact-based predictive maintenance.



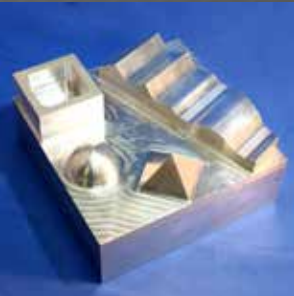
## Servo Tuning for CNC Controls

Fine-tune your machining center for precision and speed! Servo tuning is an important control issue that affects the performance of a machining center in high speed applications. Basic servo tuning can bring about a significant increase in machine performance by switching servo gains and other parameters based on an end user's tolerance and finish requirements.

Most servo tuning is experience-based and very few people can do it. Absolute's highly skilled technicians work with hundreds of parameters. They examine CNC systems and machine mechanics and study the results. We use sophisticated equipment such as a ballbar or laser to measure a specific qualitative result and fine-tune that result to match the response of the servo motors in a perfect environment.

Absolute has the capability to servo tune CNC machine tools on the end user's floor during installation. This ensures the end user gets a machine that performs to their expectations immediately.

Want to learn more about servo tuning? Ask Absolute and we'll show you how servo tuning reduces cycle times, improves finishes, and yields a high quality product. Your machine will be optimized to your applications and specific needs. Save money and be more competitive with servo tuning!



# Three Preventive Maintenance Programs

## Excellent Value



- Pull back way covers and clean chips
- Check for pneumatic leaks and wear
- Check for proper way lube distribution
- Change way oil & clean tank up to 2 gallons
- Change gearbox cooling oil
- Check and adjust air pressure
- Check way oil lines for leaks; replace or tighten if necessary
- Check and adjust backlash
- Check levelness with .0005"/12" levels
- Report general condition of machine

## Extended Service



- Pull back way covers and clean chips
- Check for pneumatic leaks and wear
- Check for proper way lube distribution
- Change way oil & clean tank up to 2 gallons
- Change gearbox cooling oil
- Check and adjust air pressure
- Check way oil lines for leaks; replace or tighten if necessary
- Check and adjust backlash
- Check levelness with .0005"/12" levels
- Report general condition of machine
- Adjust gibs on X, Y, and Z axes
- Check spindle run-out and bearing temperature
- Check machine condition and set backlash with ballbar

## Premiere Package



- Pull back way covers and clean chips
- Check for pneumatic leaks and wear
- Check for proper way lube distribution
- Change way oil & clean tank up to 2 gallons
- Change gearbox cooling oil
- Check and adjust air pressure
- Check way oil lines for leaks; replace or tighten if necessary
- Check and adjust backlash
- Check levelness with .0005"/12" levels
- Report general condition of machine
- Adjust gibs on X, Y, and Z axes
- Check spindle run-out and bearing temperature
- Level, tram, and square machine (billed at current hourly rates)
- Check machine condition and set backlash with ballbar\*
- Laser-calibrate machine\*; pitch compensate three axes

\*Available as a separate service

**Note:** Additional parts or service, if needed, at extra cost. Customer responsible for purchase/disposal of way oil. Prices vary depending on size and type of machine.