

Renishaw calibration systems essential as 'déjà vu' hits rebuild specialist Murrall & Lang

In 1989, Leeds-based Dana Spicer needed a large, heavy duty CNC machining centre, to mill, drill, and bore the ends of 2-metre long axle beams, for heavy off-road vehicles. The ideal machine, with a bed length of 5-metres, would allow pendulum machining, thereby increasing production. However, new machines of this type were costly and resulted in the company approaching rebuild specialist Murrall & Lang for a solution. Ten years later, it was 'déjà vu' for the Birmingham-based company, when it welcomed the opportunity to once again re-manufacture the machine, but this time employing the capabilities of Renishaw's calibration and machine tool performance testing systems.

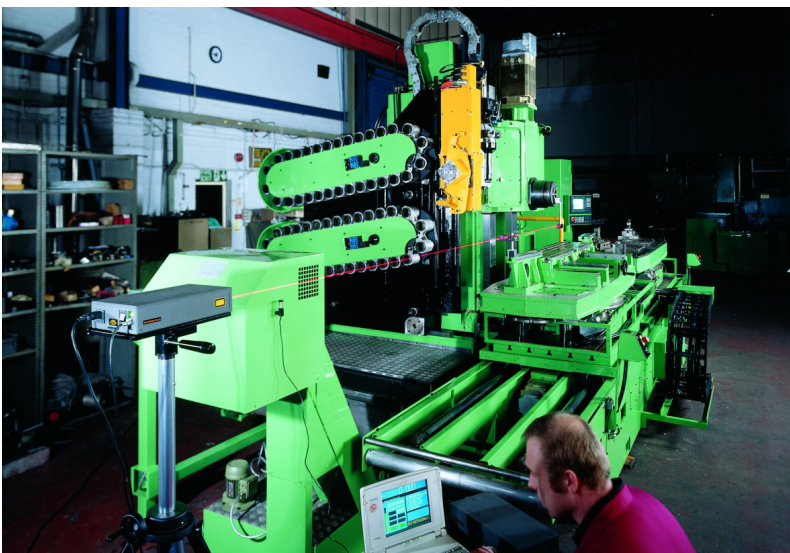
The initial rebuild

Murrall & Lang had already modified a 2-metre machining centre to accommodate pendulum machining in the summer of 1989 and convinced Dana Spicer of the cost benefits. With a contract signed, a Cincinnati 20HC 2500 (2½ metre) travelling-column horizontal machining centre was found in the USA that would machine these parts, if equipped with a suitable front base.

The volume of the axle components dictated that a pallet shuttle system would be economic, allowing unloading and loading whilst machining continued. To accommodate this, Murrall & Lang designed a special shuttle table with two index tables and fixtures, and a CNC movement of 2.5m from one position to the other. Suitable guarding protected the operator. Therefore, in addition to the usual horizontal axes of X (2500 mm), Y (1000 mm) and Z (600 mm) and the shuttle axis, the machine has two indexing axes giving a total of 6 CNC axes. This configuration was arrived at after joint discussions when the machine was first modified in 1990.

Ten years later....

After producing axles for nearly a decade and having questioned the ability to maintain the machine, Dana Spicer - having once again considered new products, which still proved very costly - decided to have the machine re-manufactured by Murrall & Lang for a second time. Having experienced the benefits of Renishaw's QC10 ballbar systems in the 1990's, Murrall & Lang had no hesitation in utilising this technology and purchasing Renishaw's ML10 laser calibration system to aid the re-manufacture 'as new', of the Cincinnati HMC for a second time.



ML10 laser calibrating a rebuilt Cincinnati machining centre- rebuild specialist Murrall & Lang could only achieve the accuracy required by Dana Spicer using ML10

Partner, Bob Murrall explained. “We had successfully produced a machine to Dana Spicer’s tolerance specifications in 1990 using a second-hand Hewlett Packard (HP) calibration system from a leading supplier. Today, that equipment is neither cost-effective nor comparable to the technological capabilities of the Renishaw systems.”

“It was our experience of the QC10 ballbar system, that led us to invest in the ML10 laser calibration equipment,” added Mr Murrall. “The ballbar is so reliable, it automatically identifies, quantifies and prioritises machine tool errors. In seeing it used here, many of our customers, including Dana Spicer, have subsequently invested in the technology.”

Complete rebuild

The Y2K re-manufacturing process included a complete mechanical rebuild, with all worn parts being reconditioned or replaced, a complete rewiring, the fitting of new digital axis and spindle drives, and a new Siemens 840D CNC control. The process took less than six months and fully met customer specification. To improve reliability, the customer wanted to maintain accuracy by axis calibration and compensation. This required the use of the Renishaw laser calibration system; part of Murrall & Lang’s quality control system.

“When you are re-manufacturing a machine, your alignments should be well within achievable levels of adjustment, allowing the alignments set by the original manufacturer to be achieved. In fact, the QC10 ballbar and ML10 laser system allow us to achieve tighter tolerances than was possible when the machine was first manufactured. Whatever we attain here, we can reproduce at the customers’ premises. The Renishaw ML10 laser calibration system is portable, easy to use and has built-in temperature compensation, allowing our customers to machine components far more accurately than once possible,” continued Mr Murrall.

Probing for variations

At Dana Spicer, the 20K hp Cincinnati machine, with spindle speeds of 3300 rpm, is fed by two 30-tool chain-based magazines. Axle beams are machined from forgings which tend to vary in size due to the forging process. To obtain the best metal conditions, once the component is mounted in the fixture, a spindle mounted Renishaw MP700 high accuracy probe is used to check length and rotation. Corrections are applied automatically to find the component centre, and if necessary to rotate the program dimensions, so as to produce the best component from the forging.

“The rebuild option allows a company to purchase a specific machine at a third of the cost of a new machine. More importantly, the accuracy of Renishaw calibration systems allows us to guarantee achievable tolerances better than the initial machine tool specification,” concluded Bob Murrall.

www.renishaw.com/calibration

This page is intentionally left blank

Renishaw plc

New Mills, Wotton-under-Edge,
Gloucestershire GL12 8JR
United Kingdom

T +44 (0) 1453 524524

F +44 (0) 1453 524901

E uk@renishaw.com

www.renishaw.com

RENISHAW 
apply innovation™

About Renishaw

Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Products include:

- Dental CAD/CAM scanning and milling systems.
- Encoder systems for high accuracy linear, angle and rotary position feedback.
- Laser and ballbar systems for performance measurement and calibration of machines.
- Medical devices for neurosurgical applications.
- Probe systems and software for job set-up, tool setting and inspection on CNC machine tools.
- Raman spectroscopy systems for non-destructive material analysis.
- Sensor systems and software for measurement on CMMs (co-ordinate measuring machines).
- Styli for CMM and machine tool probe applications.

Renishaw worldwide

Australia

T +61 3 9521 0922

E australia@renishaw.com

Austria

T +43 2236 379790

E austria@renishaw.com

Brazil

T +55 11 4195 2866

E brazil@renishaw.com

Canada

T +1 905 828 0104

E canada@renishaw.com

The People's Republic of China

T +86 21 6180 6416

E china@renishaw.com

Czech Republic

T +420 548 216 553

E czech@renishaw.com

France

T +33 1 64 61 84 84

E france@renishaw.com

Germany

T +49 7127 9810

E germany@renishaw.com

Hong Kong

T +852 2753 0638

E hongkong@renishaw.com

Hungary

T +36 23 502 183

E hungary@renishaw.com

India

T +91 80 6623 6000

E india@renishaw.com

Indonesia

T +62 21 2550 2467

E indonesia@renishaw.com

Israel

T +972 4 953 6595

E israel@renishaw.com

Italy

T +39 011 966 10 52

E italy@renishaw.com

Japan

T +81 3 5366 5316

E japan@renishaw.com

Malaysia

T +60 3 5631 4420

E malaysia@renishaw.com

The Netherlands

T +31 76 543 11 00

E benelux@renishaw.com

Poland

T +48 22 577 11 80

E poland@renishaw.com

Russia

T +7 495 231 16 77

E russia@renishaw.com

Singapore

T +65 6897 5466

E singapore@renishaw.com

Slovenia

T +386 1 527 2100

E mail@rls.si

South Korea

T +82 2 2108 2830

E southkorea@renishaw.com

Spain

T +34 93 663 34 20

E spain@renishaw.com

Sweden

T +46 8 584 90 880

E sweden@renishaw.com

Switzerland

T +41 55 415 50 60

E switzerland@renishaw.com

Taiwan

T +886 4 2473 3177

E taiwan@renishaw.com

Thailand

T +66 2 746 9811

E thailand@renishaw.com

Turkey

T +90 216 380 92 40

E turkiye@renishaw.com

UK (Head Office)

T +44 1453 524524

E uk@renishaw.com

USA

T +1 847 286 9953

E usa@renishaw.com

For all other countries

T +44 1453 524524

E international@renishaw.com

RENISHAW HAS MADE CONSIDERABLE EFFORTS TO ENSURE THE CONTENT OF THIS DOCUMENT IS CORRECT AT THE DATE OF PUBLICATION BUT MAKES NO WARRANTIES OR REPRESENTATIONS REGARDING THE CONTENT. RENISHAW EXCLUDES LIABILITY, HOWSOEVER ARISING, FOR ANY INACCURACIES IN THIS DOCUMENT.

©2011 Renishaw plc. All rights reserved.

Renishaw reserves the right to change specifications without notice.

RENISHAW® and the probe emblem used in the RENISHAW logo are registered trademarks of Renishaw plc in the UK and other countries.

apply innovation, Productive Process Pyramid, Productive Process Patterns, Productivity+, AxiSet, Rengage, Trigger Logic, ToolWise, Sprint, MicroHole, PassiveSeal and SwarfStop are trademarks of Renishaw plc.

All other brand names and product names used in this document are trade names, service marks, trademarks or registered trademarks of their respective owners.



H - 5650 - 3026 - 01

Part no. H-5650-3026-01-A