ABERLINK
Innovative Metrology

Case Study

Automotive Case Study 09/2016

Company: Controlled Power Technologies

Axiom too

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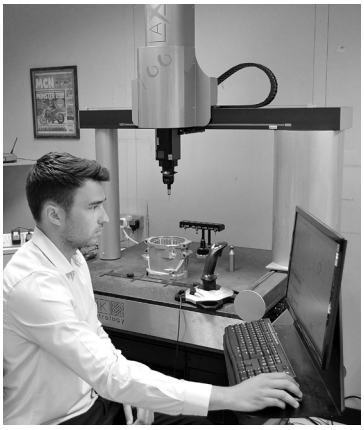

The adoption of EU legislation to limit average CO2 automotive emissions and an increasing focus on emission reduction in the US means that the need for carbon abatement is rapidly growing in importance. Coupled with rising fuel prices, company car tax now being determined by CO2 emission levels and the increasing costs of diesel powertrains, there is now stronger demand than ever before for the introduction of cost-effective, fuel efficient technologies. A leader in the field of automotive CO2 reduction technology is Controlled Power Technologies (CPT).

CPT is an independent, clean-tech, company, based at Laindon, Essex and in Coventry, West Midlands, with subsidiaries in Germany and the USA. CPT specialises in the development of cost-effective CO2 reduction measures for the global automotive industry that avoid major redesign of the powertrain or vehicle electrical system. Core competencies include low voltage power electronics, advanced control software and the application of low voltage switched-reluctance machines (SRMs) to gasoline and diesel powertrains - providing innovative mild hybrid vehicle solutions.

CPT is focused on bringing its liquid-cooled Cobra, SpeedStart, SpeedTorq and Tigers technology to mass market readiness. Based on the same core SRM architecture, Cobra is a high speed (70,000rpm) motor for electric supercharger applications which shares the same platform as the Tigers high speed (70,000rpm) high temperature tolerant generator for the recovery of thermal and kinetic energy from fast flowing exhaust gases. SpeedTorq is a 20,000rpm SRM designed for low voltage (<60V) mild hybrid applications in the driveline, thereby complementing the SpeedStart engine mounted starter generator. While Cobra is focused on trucks and buses, SpeedStart, Tigers, and SpeedTorq applications are aimed at a wide variety of cars and commercial vehicles.

The advanced nature of CPT's products and the high rpm speeds they operate at dictates that all critical components have extremely demanding dimensional tolerances. To help ensure that the required levels of manufacturing precision are adhered to the company administers a stringent quality control system. As the demand for CPT's products is rapidly growing, to allow the company's inspection function to keep pace with increased production investigations were recently made into the availability of high precision, rapid acting advanced measuring systems. The solution to CPT's quest for both accuracy and speed of inspection was found in the Axiom too Coordinate Measuring Machine from Aberlink.

CPT Manufacturing Engineer, Remie Hayter explained, In addition to their designs, the CO2 reduction ability and the reliability of our products is based on the accuracy of their component parts. Although we have a range of precise measuring equipment, when the need occurred to inspect certain geometrical features we have been using external inspection resources. As our production levels have now ramped-up the need for a more efficient, universal component inspection method became more urgent.

"Back in February, as several of the leading metrology companies were exhibiting at the Southern Manufacturing and Electronics exhibition, we decided to visit and search for a solution to our measuring needs. Whilst at the show we were able to communicate our specific needs to exhibitors and to view in-depth practical demonstrations of a number of Coordinate Measuring Machines. This allowed us to make comparison between each CMM. Having decided that the CNC version of Aberlink's Axiom too provided the accuracy, speed and ease of use that we required, we were pleasantly surprised to learn that the Aberlink CMM was also the least expensive of the options that we considered.

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"Now installed, our operators soon mastered the Axiom too's intuitive controls and software. Our Aberlink CMM is able to precisely measure each of the geometric features on all of our components and to provide rapid feed-back to production. In addition we use the Axiom too to verify the accuracy of received components in our Goods Inward Department; we also use the Axiom too as an invaluable aid for our R&D department.

"As well as delivering the required levels of accuracy to ensure the continued high precision on of components, the speed of our CNC driven Aberlink CMM and its impressive automatic measuring capabilities will enable it to keep pace with our anticipated future levels of production."

Available in manual and CNC variants, the Axiom too is the best-selling CMM from the largest UK owned Coordinate Measuring Machine manufacturer. Aberlink's Axiom too CMM can truly be described as the complete inspection centre; impressive measuring accuracies are achieved through the use of the latest metrology techniques and advanced in-house manufacturing methods. The Axiom too has an aluminium bridge with a very low thermal mass, rendering it ideal for use either in controlled environments or within less than perfect shop-floor conditions. Thanks to the CMMs' use of advanced materials, reduced inertia results in class leading speed of operation. For increased accuracy air bearings of optimised stiffness are employed on all axes, whilst a granite Y Beam allows preloading of bridge bearings in both directions. Borrowed from the Aerospace industry, the CMM's sturdy component support consists of an advanced granite/aluminium honeycomb construction, provides natural damping and further improving the machine's thermal properties. Despite the Axiom too's generous measuring volume 640x600x500 or 640x900x500, the machine occupies a relatively small footprint.

The Axiom too utilises Aberlink's famous, intuitive 3D software. A welcome bi-product of any Aberlink CMM inspection routine is that a simultaneous picture of the measured component is created on the computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, are then picked off as required. In essence this 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is the easiest to use CMM software currently available, as a result a complete novice is usually able to perform relatively involved measurement routines after just 5 minutes training.

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