

AFRC

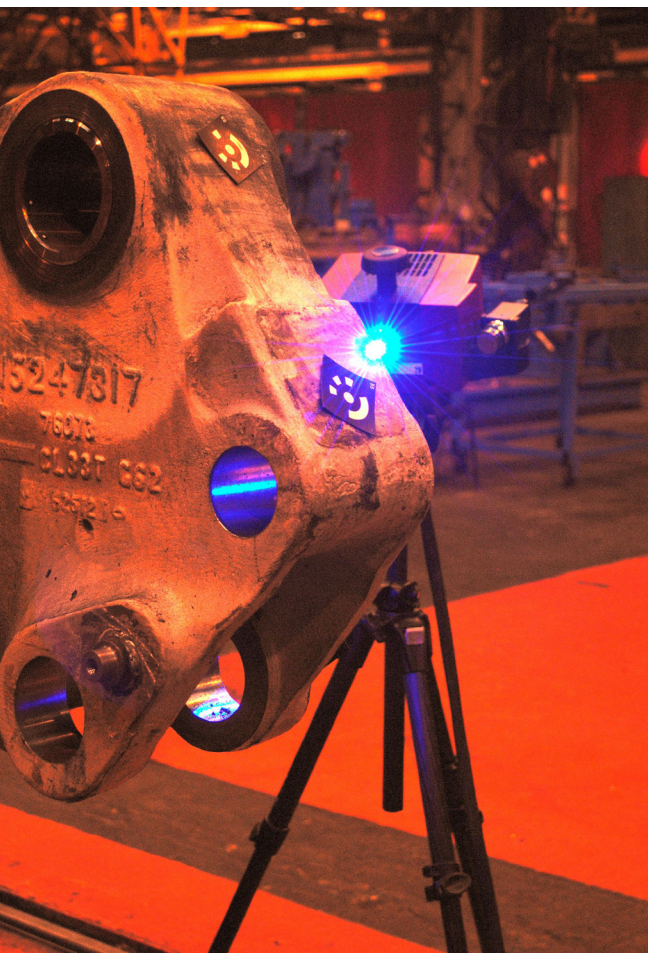
ADVANCED FORMING RESEARCH CENTRE

UNIVERSITY OF STRATHCLYDE



Advanced Forming Research Centre

Terex



Project Background

Terex Equipment Ltd manufactures rigid and articulated off-road dump trucks.

Terex invited the AFRC to host a technology demonstration at the company's Motherwell facility to explain how state-of-the-art 3D scanning technology could enhance manufacturing of large precision components and assemblies, such as the vehicle chassis, and speed-up the inspection process.

Problem

The manufacture of chassis for large vehicles, such as dump trucks, requires the production and precision alignment of a number of constituent parts. Accurate measurement of the interface points is crucial to ensure safety and quality across the assembly process, and is a key driver in production performance.

Conventional methods of geometric evaluation - to accurately measure how different parts fit together with varying dimensional tolerances - currently involves manual measurement and inspection of each component, at different locations, in the facility. This can take around five days, adding cost and risk to the overall production process.

Terex chose the AFRC to demonstrate how its state-of-the-art techniques and production knowledge could be applied to improve fabrication on the production line, without interrupting operations.

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What we did

The AFRC has extensive experience of optical measurement solutions and technologies for 3D coordinate measurement. A combination of two GOM systems was used at the demonstration to define all the key features of a dump truck chassis.

The GOM TRITOP Optical CMM system is a mobile measurement system which accurately defined the 3D coordinates of the chassis data points. It quickly and precisely calculated the 3D displacements and deformations of each component and compared those to the nominal CAD model.

Using blue light technology, the lightweight GOM ATOS Compact Scan with optical probe system, digitally recreated the various geometries of the key bore features of the chassis into a 3D model representation. Advanced hardware is combined with integrated, powerful software for scanning and inspection. Like TRITOP, the data can be used to take precise measurements or for CAD comparison.

Result

The GOM TRITOP system produced a graphical representation of the deviation of more than 300 points on the chassis. This evaluation and inspection process took less than half a day and clearly demonstrated to Terex that the use of GOM 3D scanning technology can reduce assembly line assessment by around 90%.

This removes manual involvement and allows fast, full inspection within the production cycle ensuring that the correct interaction of complex assemblies can be maintained with minimal interruption to production, lowering costs and risk to safety.

The AFRC demonstration clearly showed to Terex that advanced optical measurement solutions and technologies for 3D coordinate measurement can improve the efficiency and time taken to carry out inspection and ultimately cut expenditure from the assembly line process.



Contact us

Advanced Forming Research Centre
University of Strathclyde
Email: info@afrc.org.uk
Tel: +44 (0)141 534 5200
www.afrc.org.uk