

inspect

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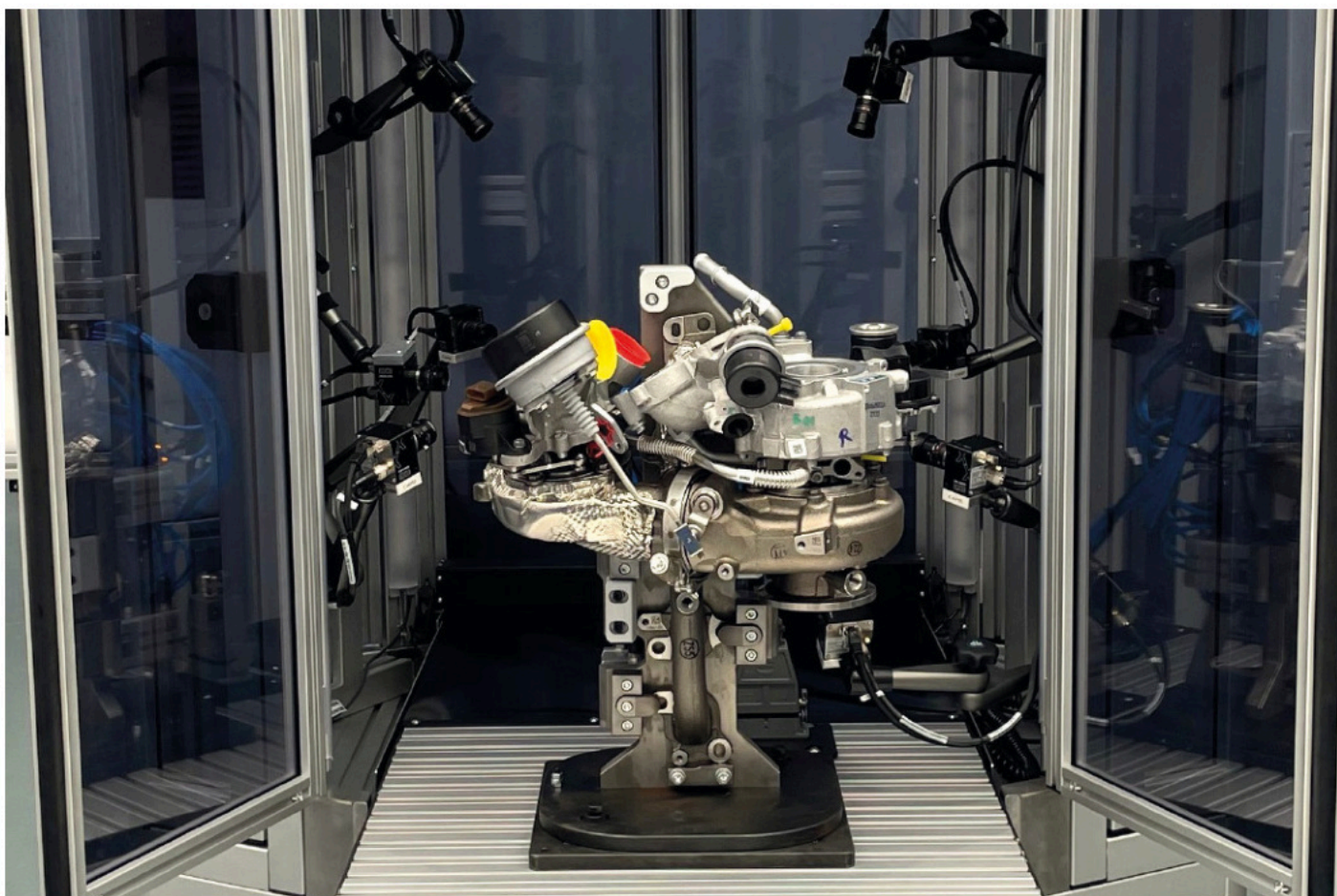
UNOFFICIAL ENGLISH TRANSLATION

The original article was published in German in inspect, a trade magazine published in Germany. Prepared for CRETEC. The German original remains the reference.



Automated end-of-line inspection of turbochargers

Original publisher artwork, logos and advertisements are retained in their original language.



The eight 5 MP cameras, each with a high-resolution field of view, enable complete all-round 3D inspection of the turbocharger assemblies.

Automated end-of-line inspection of turbochargers

Modular machine-vision system with robot integration optimises quality assurance

An automotive supplier replaces manual turbocharger inspection with a flexible, automated system using machine vision and robotics. The modular cell provides a compact, versatile solution with high precision, simple operation and integrated documentation.

The existing end-of-line station - the final complete quality-assurance stage for automotive turbocharger assemblies - needed further automation and greater efficiency. Previously, two employees per shift in three-shift operation applied labels, inserted plugs, scanned IDs and carried out visual quality checks. Finally, the turbocharger assemblies were placed in trays in shipping boxes, with an image recorded for each one.

The existing process, which included several manual tasks, had to become more efficient, automated and sustainable. This applied both to the concept with an active robot and to the contingency concept for a robot fault. A cycle time of less than 100 seconds was specified for the entire process.

Flexible, time-saving concept

At the end of the production line, an

Key points at a glance

To improve efficiency, manual end-of-line quality control of turbochargers has been replaced by an automated system. A robot handles the components, while a modular inspection station with several cameras performs the visual checks. The flexible QBIC cell concept combines compact construction and easy access with machine vision, robotics and AI, enabling high automation and precision. Finally, the inspected components are documented and packed for shipment.

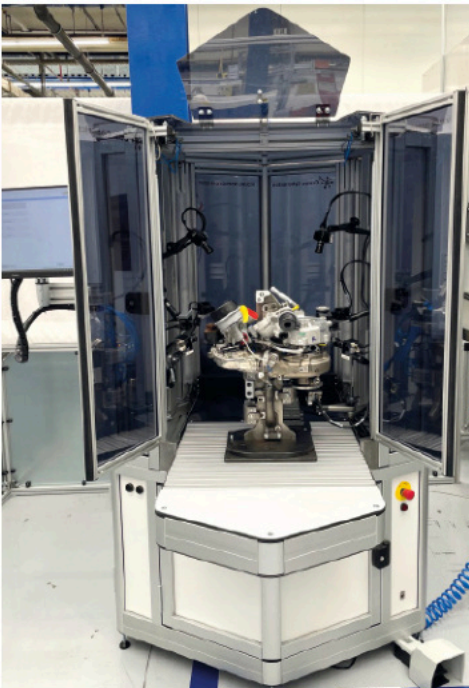
employee applies a label to the turbocharger and scans its ID. This starts the robot, which picks up the turbocharger, presents it to the employee for plug insertion and positions it in the QBIC inspection cell. Four 5 MP cameras above and four below capture the complete unit spatially and use machine vision to inspect a wide range of features. The robot then places the turbocharger in the box. An existing vision system captures the unit there for the final photographic documentation. Every box reaching the end customer thus contains inspected, defect-free goods.

Cretec has maintained an intensive, continuous exchange of experience with the global automotive supplier for years, through a series of delivered vision systems. Joint development also produced the Turbo-PCS communication system, in which the machine-vision applications on the production lines are fully integrated.

Space-optimised all-rounder

The consistently modular QBIC cell architecture provided a compact solution to this complex vision task, either stand-alone or integrated, with high flexibility and automation. QBIC already demonstrates its advantages during the feasibility study by simplifying demanding requirements and solution approaches. The robotics, control, data-analysis and communication modules are integrated directly into an autonomous system.

Good access for greater flexibility



The modular QBIC cell architecture enables a compact, stand-alone or integrated solution to this complex vision task, with high flexibility and automation.

Company in detail

Cretec GmbH

Cretec GmbH, based in Büdingen, Hesse, develops, manufactures and sells industrial machine-vision modules and complete solutions, code-reading systems, intelligent LED lighting, cobot/robot vision and integrated artificial-intelligence algorithms. A particular focus is networked digital communication on Industry 4.0 platforms, from OPC UA to machine-to-machine payments using IOTA. Compact construction, powerful hardware and software, robustness in harsh industrial environments and, above all, ease of use characterise the solutions. The extensive product portfolio is complemented by efficient expertise in industry-specific applications with short development times.

The patented hexagonal design of the QBIC platform provides excellent access from all sides and great flexibility in designing particularly space-saving, mobile system solutions. Integrated retractable wheels allow it to be transported quickly for delivery or relocation and connected compactly to other QBIC units.

Integration options include electrical equipment, controls, a high-performance PC, cameras, the VisionTube code verifier, a cobot or robot, different vision modules, intelligent lighting, a large touchscreen monitor, communication modules for OPC UA, IOTA and neural networks.

A mains-independent power supply maintains operation even during a power failure, preventing data loss. Integrated high-performance PCs also make these system solutions suitable for complex AI tasks using deep learning.

Applications

Complete QBIC solutions cover a broad range of applications: pick-and-place, registration and classification tasks, ID codes, inspection, 2D and 3D measurement, surface inspection, decision-making and sorting processes.

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