

Transportation Fact Sheet

GOM's mobile optical metrology systems are used to control quality in train wagon building, reduce ship downtime during maintenance and repairs, and to improve driver comfort in utility vehicles by locating sources of unwanted vibrations.

Scan-Xpress offers its sales and service experience and support in the railway engineering, shipbuilding and utility vehicles sectors.

- **Railway Engineering**

Train Building Body-in-White

Manufacturers of modern rail vehicles need to guarantee sustainable mobility over the entire lifetime of their railroad cars. Today's coaches combine attractive design with technical innovation, and deliver optimal operational performance coupled with maximum reliability, availability, maintainability, safety, environmental protection and cost-efficiency.



GOM's portable metrology systems support production controls and inspection of repairs and maintenance performed on railroad car bodies. They analyse inspection criteria that include body-in-white levelling to ground and wheel set, wall perpendicularity, and dimensions and distortions for door and window openings. GOM's TRITOP^{CMM} system handles:

- Measurement of 3D coordinates
- Verification against CAD
- Measurement of dimensions and angles
- Measurement of standard geometries and mounting elements (threads, cylinders, edges, etc.)
- Inspection sections

The ATOS full-field 3D digitizer is the system of choice when verification of an entire carriage surface is required.

Quality Control on Train Wagon Bogies

Another typical application for GOM's TRITOP^{CMM} system is verification of welded bogies for coaches. These swivel trucks are used in many European trains and are assembled at different locations throughout Europe. Therefore, each swivel truck needs to be measured and delivered with a measuring protocol. Using the



TRITOP^{CMM} system, one person can typically inspect a bogie and create a measuring report within forty minutes. An automatic evaluation routine aligns the measured data with the nominal data, calculates any deviations, and prepares and prints the final measuring report.

- **Shipbuilding**

Reverse Engineering for Repair and Overhauls

Today an intelligent combination of knowledge, experience and craftsmanship is required to make ship construction and maintenance successful, safe and financially viable. Precision and cost-efficiency in the shipbuilding industry can be enhanced with high-end CAD programs and optical measurement systems. GOM's TRITOP^{CMM} digital measurement



system supports the rapid manufacturing of spare parts with modern CAD/CAM systems and CNC machines, reducing the time ships spend in dry dock from months to just days. Optical 3D metrology from GOM is used to improve the efficiency and precision of repair and reconstruction work in this sector.

Hull Assemblies and Interior Compartments

Using GOM's TRITOP system represents not only a major breakthrough in efficient and accurate 3D modeling of hull assemblies. The system measures not only the outside body shell but also generates measurements on small interior compartments that are not readily accessible. Since spaces within the ship's hull are often extremely narrow, obtaining reliable measurements can be a major challenge.

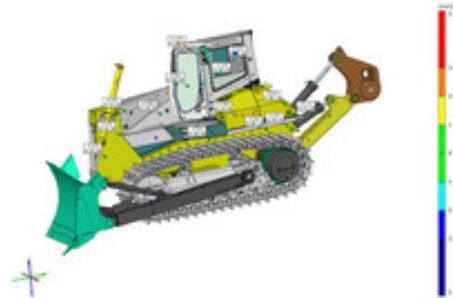


However, GOM systems can be used to create a 3D design of the compartment geometry within a few hours. The 3D data is then used as direct input for CAD systems, making units easy to design, build and integrate smoothly into existing compartment structures.

- **Utility Vehicles**

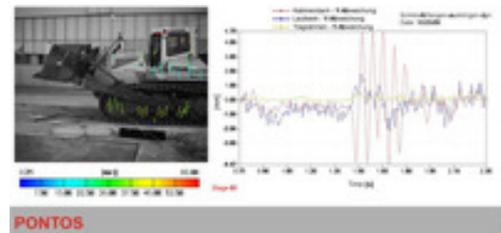
Shape and Dimension Control

GOM's portable TRITOP^{CMM} system supports 3D coordinate measuring on objects of almost any size. It is ideally suited to verify the geometry and dimensions of machinery and utility vehicles. Measured 3D coordinates can be aligned with a CAD model to reveal any deviations from the design and to identify problems such as warp and bending. The fast and flexible measuring system can be operated by a single person and allows on-site verification of shapes and dimensions, without having to move vehicles into a garage. As the results are stored digitally, distances, angles, GD & T, etc., can always be subjected to further analysis at a later stage.



Vibration Analysis

GOM's PONTOS deformation measurement system analyses the behaviour of vehicles in operation to detect sources of unwanted vibrations. Vehicles can be observed in real time under different conditions, under varying mechanical loads, temperatures or speeds. The system supports



online analysis of deformation, displacement, acceleration, speed and trajectories, replacing conventional extensometers and acceleration sensors. PONTOS is the system of choice for root cause analysis of vibrations to optimize passenger comfort and safety.