



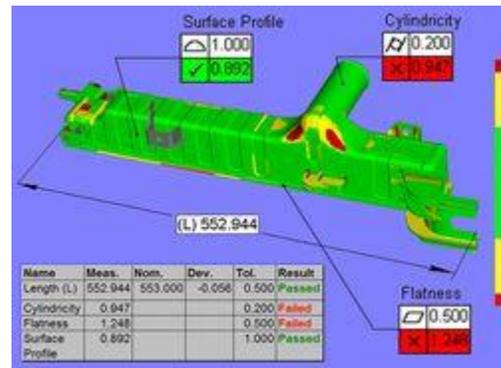
3D Scanning for Automotive Parts: More Timely than Ever

Today's automotive parts are more complex than those manufactured even a decade ago. A number of factors are driving this complexity, but **the challenge is clear: it's increasingly difficult to properly inspect and measure auto components using traditional methods.**

What's Fuelling Auto Part Complexity?

Radiator tank inspection using 3D scan data from ShapeGrabber and Geomagic Qualify software.

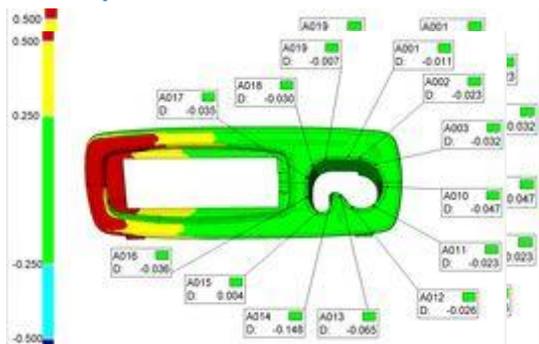
With compound curves and multiple features, today's auto components – be they body panels, chassis components, under-the-hood or interior components – have ever more complex shapes.



This is largely driven by these factors:

- **Aesthetics:** Today's consumers expect their cars to be aesthetically pleasing – both inside and out. This has led to more curvaceous and innovative part designs that can take on a variety of shapes.
- **Ergonomics:** To prevent strain on the body, cars are incorporating design features that make it easier and more comfortable to drive and interact with a vehicle, such as dash boards that curve to “wrap” around the driver, providing easier access to controls.
- **Smaller Footprints:** To improve fuel economy, car manufacturers are miniaturizing components to fit more equipment into smaller spaces. As a result, part shapes are becoming smaller and more complicated.
- **Technology:** Car manufacturers are making more complex parts because they can. Thanks to the capabilities of plastics as well as 3D CAD and 3D CAM systems, it's easier than ever to create new shapes and innovative components. Modern manufacturing methods also allow companies to produce these complex shapes cost effectively.

The Implications



Car door insert inspection using 3D scan data from ShapeGrabber and Geomagic Qualify software. Complex auto parts present new challenges to manufacturers. Many find that the traditional methods for ensuring quality (such as calipers, gauges and automated touch-probe measurement) are not always feasible for accurately and cost-effectively measuring complex modern part shapes. If an auto maker can't ensure that a part meets its spec, that part's benefits are lost – no matter how innovative or ergonomic it may be.

3D Laser Scanning: Inspecting Complex Auto Parts

Increasingly, automotive part manufacturers are turning to 3D laser scanning to inspect even complex-shaped components thoroughly and quickly. Comprehensive 3D scan data of a part's entire surface geometry can be acquired in just minutes, then compared to a CAD file or to a known good part.



ShapeGrabber Ai810 3D Scanner system with plastic radiator tank on rotary scan table (photo on left)

Automated 3D scanner systems can also produce full-color tolerance maps (color-coded 3D images used to quantify the deviation of the part's shape from CAD specifications) for quality control inspections on metal and plastics parts of all kinds.

3D laser scanners offer a number of immediate advantages to the automotive industry:

- **They are fast.** 3D laser scanners are many times faster than CMMs, gauges and calipers and they can conduct automatic or first-article inspection in minutes. Whether a manufacturer is troubleshooting warpage, identifying fit problems, or evaluating tool and die wear, an automated 3D laser scanner can reduce both inspection time and cost.
- **They are easy to use.** Laser scanners are industrial – not scientific – instruments and are designed to be used by operators on the line. In most cases, operators simply need to place a part on the scanning table and push a button to begin the scan.
- **They are cost effective.** While new to many in the auto industry, 3D laser scanning is a mature technology (we've been pioneering it at ShapeGrabber for 17 years) that is competitively priced and delivers a solid ROI. By virtualizing multiple inspection gauges on a single ShapeGrabber scanner, for example, manufacturers can cut costs in a number of areas while increasing production efficiencies and satisfying quality requirements.
- **They are accurate.** 3D laser scanners are built to handle complexity. Laser scanner systems leverage the accuracy and speed of lasers to precisely render every feature of an object into a three dimensional model. The model can then be inspected for defects, further augmented or reproduced as is. Regardless of how complex the object's shape may be, 3D laser scanners can capture every metric – not just a few points.

Driving Efficiency

Automotive manufacturers looking for a speedy and simple measurement and inspection system can benefit greatly from the use of a laser scanner system. With the ability to accurately inspect and measure today's complex-shaped automotive parts, 3D laser scanners offer a fast, efficient and reliable solution for measuring automotive parts that would otherwise be too time consuming, costly, or simply impossible to measure.