NDI APPLICATION NOTE

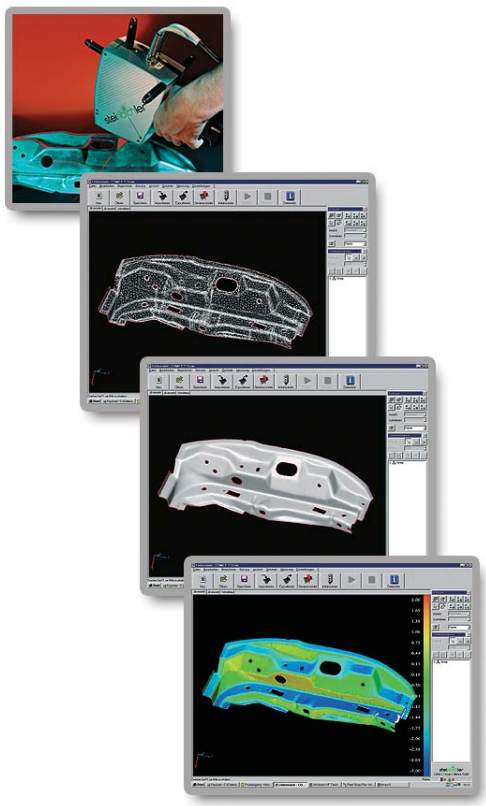
REVERSE ENGINEERING USING HANDHELD LASER SCANNER

PROBLEM

Not all designs are based on conventional forward engineering principles. For many reasons, the physical model, tooling or part itself maybe the only source of information available to design engineers. Without precise mathematical CAD models, it becomes extremely difficult to produce supporting documentation, inspection routines, and NC cutter paths for tooling. Whenever CAD data is unavailable to fully define a part's geometry, Reverse Engineering is required.

SOLUTION

Quickly bring physical parts into the digital domain. Create high-quality engineering surfaces in CAD using 3D measurement data captured by the T-SCAN handheld laser scanning system. Use the scan data to clean up, modify, sculpt and reconstruct surfaces to fully define a part's geometry in various CAD/CAM environments.



With the T-SCAN handheld laser scanner, operators simply walk around large parts or assemblies and perform freeform scanning. The handheld scanner is as simple to use as a paintbrush. By freely waving the handheld scanner over the part, surface measurements are rapidly acquired to produce dense point clouds, defining the part's geometry. Because it is not physically attached to another measurement system, the scanner can be easily positioned to ensure exceptional coverage of the part. This unrestricted freedom and range of motion is achieved by using the Certus optical position sensing system to constantly measure the position and orientation of the handheld laser scanner during the scanning process. The Certus ensures that all measurements are reported in a common frame of reference.

PRODUCT

The best products to assist you with your Reverse Engineering needs include:

- NDI OPTOTRAK PROseries Measurement System.
- Steinbichler T-SCAN, an OPTOTRAK-based Handheld Laser Scanning System.

BENEFITS

- Truly portable and easy to set up.
- Optically tracked, allowing for greatest range of movement.
- No laser beam to accidentally block during scanning.
- Non-contact scanning allows for measurement of precious artifacts and soft materials.
- Collect data at faster rates than conventional measurement techniques.
- Inspection software and tactile probes also available for Part-CAD-Inspection.

INDUSTRIAL APPLICATIONS

By attaching targets to any object, you can measure or track its position and orientation. Using convenient digitizing probes you can also capture 3D surface points easily. NDI technologies offer many possible solutions, some of which include:

Coordinate Measurement

- Part-to-CAD inspection
- Reverse engineering
- Assembly verification
- Fixture verification
- Offline programming
- Real-time 3D/6D feedback
- Cell alignment

Dynamic Tracking

- Part positioning/alignment
- Vibration analysis
- Part deformation
- Part dynamics
- Structural testing
- Guided assembly
- Door and Closure Testing

With over 10,000 installations in more than 30 countries worldwide, NDI technology provides the accuracy and reliability our customers have come to trust. Let us help you determine the NDI product best suited to solve your most demanding measurement problem.

NDI
103 Randall Drive
Waterloo, ON, Canada N2V 1C5

Phone: +1 (519) 884-5142
Toll Free: +1 (877) 634-6340
Global: + (800) 634-634-00
Fax: +1 (519) 884-5184

NDI EUROPE GmbH
Fritz-Reichle-Ring 2
D-78315 Radolfzell
Germany

Phone: + 49 (77 32) 939 19 00
Global: + (800) 634 634 00
Fax: + 49 (77 32) 939 19 09

NDI ASIA PACIFIC
Room 2603, 26th Floor
Office Tower, Convention Plaza
1 Harbour Road
Wanchai, Hong Kong

Phone: + (852) 2802 2205
Fax: + (852) 2802 0060

info@ndigital.com
www.ndi.ca

Printed April 2006 NDI P/N 8300184