APPLICATION DATASHEET

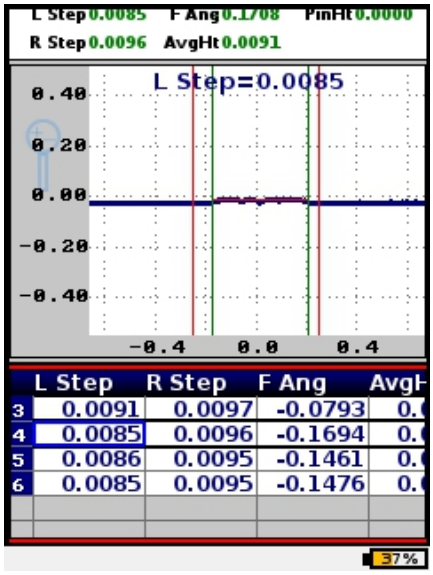
Fastener Height / Pin Protrusion

INSPECTION PROBLEM

Fasteners on the exterior of aircraft must be flush to the surface within a certain tolerance. A fastener that protrudes above or one that is driven below the adjacent surface may adversely affect performance in flight.

Mechanical devices measure the height at one single point on the fastener head and an operator must position the stylus many times on one fastener just to find the highest point. This can be a very time-consuming process. 3D mapping of the surfaces is not feasible; it requires expensive equipment, is very time-consuming and the equipment is not practical to use on the flight line.

REQUIREMENTS



Measurements – The height and depth of the fastener relative to the surrounding surface must be measured to within thousandths of an inch. Fasteners that measure outside the tolerance range for height or depth must be identified immediately. The read-out must flag any out-of-spec conditions so the operator can mark the fastener or take corrective action.

Instrument – Fasteners are located all over the outer skin of the aircraft, on the fuselage, wings and tail. The measurement instrument must not only be portable, but also lightweight so the operator can inspect any accessible fastener on the plane. A measurement cannot take more than a few seconds because there are hundreds of fasteners to be inspected. Documentation may be required for all measurements or for only those that are out-of-spec.

LASERGAUGE® SOLUTION

LASERGAUGE® SYSTEM

Depending on the diameter of the fastener and the resolution required, an HS702 sensor with either a 1.2" or 1.9" field-of-view is recommended. This DSP sensor displays the profile of the fastener head in real-time on the LCD so that the operator can make sure that the sensor is positioned correctly over the fastener.

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MEASUREMENTS

Measurements are automatic. The operator positions the laser stripe over the fastener and releases the trigger. The edges of the fastener are identified, and the height and/or depth are calculated for both the fastener's left edge and right edge relative to a surface line-fit.

Each measurement takes approximately less than two seconds to complete and to display the results in the data table. SPC or tolerance limits can be specified and any measurements that are outside the spec range are shown in red. The data table is automatically saved for documentation of the measurements taken.

ADVANTAGES REALIZED

Time Savings – Hundreds of fasteners can be inspected in a matter of minutes, and the measurements automatically documented.

Cost Savings – Due to its speed and portability, one LaserGauge® system can be used to support several repair facilities saving the cost of duplicate equipment.

Accurate & Repeatable – With sensor resolution in the thousandths of an inch, measurements are much more accurate than conventional methods.

RELATED APPLICATIONS

ANGLE

The angle of the head of a rivet, screw, bolt or other fastener relative to adjacent surfaces may indicate improper installation. Even though the head is within flushness tolerances, an exaggerated angle can be of importance to aerospace and space vehicles.

FILL

After a countersink is drilled and a fastener is inserted, a dielectric fill material is then placed over the fastener head and sanded to the surface flushness. The sensor can measure the height/depth of the fill material relative to the surface, both before and after sanding, sealing or finishing.

LMI
Linear Measurement Instruments, Corp.

101 North Alloy Drive, Fenton, MI 48430 USA
Sales@lmicorporation.com
810.714.5811
www.lmicorporation.com