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Computer Aided Metrology Systems Are Required To Implement The Predictive Shim Process

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2014 CMSC Abstract

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Shims are used to compensate for the variation in aircraft assembly. The 787 has (3) intensely complex assemblies, joining the Fuselage Sections, Attaching the Wings to the Fuselage, & the Vertical Stabilizer installation.

These assemblies need shims created before the parts actually arrive for Final assembly.

Joining the Fuselage Sections, attaching the Wings to the Fuselage, & the Vertical Stabilizer installation, in a timely manner, is critical to supporting the aggressive 787 program's production rate. The digitally measured (Laser Radar, Laser Tracker, Laser Scanner, and or Digital Photogrammetry) interface surface data is sent to the Predictive Shim Program. This process does a "virtual fit" of the (2) interfacing parts and produces the "filler" model to close the gap. This "filler model" or shim data is sent to the "Shim Crib" where Numerical Control machines produce the actual shims. These STP compatible "Shim Models" are also created with Additive Manufacturing (3D printing) technology today.

The 787 Heads Up Display (HUD) calibration process is now using the Predictive Shim Program to final set the Heads Up Display's connection to the 787 Aircraft.

Thanks to our current CAMS technology, custom shims and "Best Fit"fuselage circumferential splice parts can be created with 3D printing (Additive Manufacturing) technology.

Boeing patent # US 7,756, 321