

If you can't bring the airplane to the blast cabinet...

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The Problem:

A large United States Air Force base needed to shot peen the ID of landing gear components. Landing gear undergoes tremendous stress, especially when it's attached to a heavily laden military plane touching down on a primitive runway in some faraway land. After a set number of flights, or after an especially rough landing, maintenance personnel disassemble the landing gear and repair any damage. Before re-assembly, critical components must be shot peened to factory spec — a pretty straightforward project.

But the customer hoped to peen one critical part without removing it from the aircraft. The area to be peened is located 7 to 10 feet off the tarmac, just below the belly of the plane. And the customer was concerned about leaving steel shot lying about the flight line. Loose shot might get sucked into engines or blown about by aircraft exhaust, possibly injuring personnel or damaging property.

The area to be peened is the inside of a circle measuring 15 inches in diameter by 4 inches deep. It needs to be peened to an intensity of 0.010 to 0.014 on the A strip.

This is a relatively straightforward application, well, except that the part is attached to an airplane. Imagine trying to shot peen the inside of a large wedding band suspended 10 feet off the ground.

Production rate is not at issue. The savings would come from the time and labor not spent removing and re-installing this large component.

Sample processing with the actual part was impractical, so we made a circular band as our test fixture and attached an Almen block to the inside. Using a Baiker rotating nozzle, we processed the part in a cabinet in our lab to demonstrate that the equipment could achieve the desired peening intensity.

The challenge would be getting that Baiker nozzle out to the flight line and up into the air, then capturing the shot.

The Solution:

We combined a few technologies, mounting the Baiker nozzle and its controller to a Clemco Super Comet (formerly the ZERO BNP 300-4A).

The Super Comet is a portable closed-circuit pressure blast system that includes a 150-cfm media reclaimer and dust collector. In standard configuration, the Super Comet comes with a shrouded blast-and-recovery head.

Herb's Solutions



Herb Tobben creates solutions to customer problems at ZERO's Sample Processing facility.

We replaced that head with a pair of domed disks that covers both openings of the area to be shot peened. This creates the "blast enclosure."

The disk with the blast system attaches to one side of the landing gear, and an oscillator moves the rotating nozzle through the ID of the part.

The disk with the vacuum recovery system is attached to the other side of the landing gear to draw the shot back to the reclaimer.

To get all this apparatus up in the air, we beefed up the Super Comet's frame and attached larger wheels, then we mounted a telescoping arm that raises and lowers with a hand crank. The operator raises the blast and recovery system, and clamps it to the landing gear.

The Baiker control module regulates rotation speed, while conventional electrical components control blast duration and nozzle oscillation. The combined systems ensure precise, repeatable shot peening.

We even shipped the test fixture with the blast system, so maintenance personnel can periodically process test strips to verify the process.

With little modification, this system could be adapted to precisely shot peen internal components on a variety of aircraft, machinery, and structural steel.

Got a question about shot peening, abrasive blasting, or sample processing? Clemco can help. Call 636 239-8135 or submit your request online at www.clemcoindustries.com.

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