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Eddy Current Tie Bolt Inspection System Outperforms Other Testing Methods by Jerry Atkinson

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Aircraft wheel tie bolts are extremely safety-critical, so airlines strive to us the best available test methods to locate potential problems. Traditionally, magnetic particle testing or penetrant testing methods have been used to test both steel and inconel tie bolts, but a new study showed that eddy current testing of tie bolts outperformed other nondestructive testing methods.

Since aircraft wheel tie bolts are safety-critical, soairlines continually strive to employ the best available test methods to locate potential problems. A new eddy current Tie Bolt Inspection Systemnow used by major airlines and wheel and brake shops has proved to outperform penetrant, magnetic particle, and ultrasound testing. Tests proved the Tie Bolt EC Test System could detect smaller flaws than other NDI methods, which missed many flaws because some bolts were not cleaned well enough. Grease and dirt seeped into the crack prevented accurate visual inspection. When the Tie Bolt Inspection System was used, however, bolts did not have to be as well cleaned for accurate testing. Eddy current testing of the threads also proved more reliable than some methods because of bolt deformation. Since not all bolts are the same, this caused inaccurate or unreliable readings on certain bolt types.

The Tie Bolt Inspection System offers other advantages as well. The twin-roller flatbed allows quick inspection cycles for each bolt. The eddy current probe included in the system was specifically designed to detect flaws in both steel and inconel bolts. No other probe is required.  The robust probe tested more than 12,000 bolts during its field trials. The system also features a go/no-go alarm set that is operator independent. The robust and highly sensitive eddy current probe also has been proven to detect smaller defects than the other NDT methods.

The Tie Bolt System takes up less space than magnetic particle and penetrant testing systems, enabling the operator to perform the inspections in the production line, where it best fits for productivity. A modest 2-foot Ã— 3-foot area with AC power is all that is needed. Productivity can be increased, smaller flaws can be detected more reliably, cost is lower, there are no chemicals to be disposed of, and bolts can be discarded during inspection instead of on the ramp while in service. Whatâ€™s more, since ET alone is required, training need only be done for one NDT method.

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