



**SAIB:** NE-16-22

**SUBJ:** Turbine Engine Combustion Section – JT8D Series Turbofan Engines **Date:** September 2, 2016

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*This is information only. Recommendations aren't mandatory.*

## **Introduction**

This Special Airworthiness Information Bulletin (SAIB) alerts you, owners, operators, and certificated repair facilities of airplanes equipped with certain **Pratt & Whitney Division (P&W) JT8D series turbofan engines**, that there is a potential for these engines to experience increased low-pressure turbine (LPT) stage 4 blade failure. At this time, the airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Regulations (14 CFR) part 39.

The blade failure may be caused by repaired combustion chambers that were returned to service outside of published repair limits. Affected engines are all JT8D-209, -217, -217A, -217C, and -219 turbofan engines with combustion chambers that were repaired by Aircraft Technology Inc. (ATI), Hollywood, FL, USA (FAA repair station certificate no. ETQR115L /EASA certificate no. 4108).

## **Background**

P&W JT8D turbofan engine LPT stage 3 and stage 4 blades are sensitive to a 9-per-rev resonant vibration caused by the 9 individual combustion chambers. This condition results in wear of the shroud “Z” notch. The wear reduces vibration dampening provided by the inter-locking blade shrouds at stage 3 and stage 4 leading to high-cycle fatigue blade fracture. P&W issued Alert Service Bulletin JT8D-A6224, Revision 6, dated May 3, 2007, detailing a torque-check inspection of the stage 3 and stage 4 LPT blades. The FAA mandated repetitive torque inspections of the 3<sup>rd</sup> stage and 4<sup>th</sup> stage LPT blades for shroud notch wear in AD 2011-07-02 (76 FR 16526, March 24, 2011).

We have received reports of combustion chambers, part numbers 803114 and 803115, suspected of being returned to service outside of published repair limits. Repair limits are defined in P&W JT8D-219 Engine Manual Section 72-41-14, Inspection /Check Table 801. The repaired combustion chambers are suspected to have resulted in multiple engine failures on JT8D-219-powered airplanes operated by a major U.S. air carrier. All of the failures resulted in safe landings. Investigation revealed that combustion chambers repaired by ATI had oversized M, Q, R, and W gaps. Testing correlated this condition to an increased excitation of the LPT stage 4 blade, causing:

- increased wear of the shroud “Z” notch,
- reduced vibration damping, and
- increased high-cycle fatigue fracture rate of the LPT stage 4 blade.

The failures occurred between 5,000 to 7,000 hours after installation of the affected combustor chambers. As a mitigation plan to detect notch wear, the affected U.S. air carrier reduced their torque inspection interval to 4,800 hours of service. Their mitigation plan has been successful to date.

Affected engines may exhibit poor exhaust gas temperature (EGT) margin; however, restored EGT margin does not necessarily ensure engines using ATI combustion chambers are not affected.

## **Recommendations**

1. The FAA recommends that you review your engine service records to determine if the engine contains combustion chambers repaired by ATI between June 2005 and October 2012.
2. If the engine contains combustion chambers repaired by ATI between June 2005 and October 2012, we recommend that you perform the initial torque inspections specified in AD 2011-07-02 at a decreased interval as determined by your field experience and approved Continued Airworthiness Maintenance Program. Continue to perform the repetitive inspections at the intervals determined by the inspection results of the AD.
3. We also recommend that you remove the suspect combustion chambers at the next opportunity and inspect the chambers in accordance with the P&W engine manual.

## **For Further Information Contact**

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## **For Related Service Information Contact**

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