



## EASA Safety Information Bulletin

**SIB No.:** 2009-19  
**Issued:** 18 June 2009

**Subject:** Standard Practices - Turbine Engines Critical Parts Cleaning

**Ref. Publications:** Federal Aviation Administration (FAA) Special Airworthiness Information Bulletin (SAIB) NE-09-34 dated 8 June 2009.

**Description:** The FAA published the above-referenced advisory document (which is attached as pages 2 and 3 of this bulletin) to advise owners, operators and certified repair facilities of turbine aircraft engines of the potential of uncontained failure of critical rotating parts due to aggressive grit blast cleaning during routine maintenance.

After reviewing the available information, EASA supports the recommended actions contained in FAA SAIB NE-09-34.

Since this is a 'generic' subject that addresses all turbine engines, irrespective of the State of Design (origin) of the engine, the SAIB cannot be considered as a 'State of Design' advisory. However, the mistaken impression may exist that these recommendations apply only to engines of US origin. For that reason, EASA has decided to explicitly apply these recommendations to all turbine engines.

This SIB is published to ensure that all owners, operators and certified repair facilities of turbine aircraft engines installed on aircraft registered in European Union Member States or associated countries, are made aware of these recommendations.

Where the FAA SAIB specifies to "*forward information documenting the damage to the original engine manufacturer and the FAA Engine Certification Office*", prevailing European regulations indicate that reporting (when required) must be done to the Competent Authority and the approval holder of the affected product (engine type design).

**Applicability:** All turbine engines, installed on any aircraft.

**Contact:** For further information contact the Airworthiness Directives, Safety Management & Research Section, Certification Directorate, EASA.  
E-mail: [ADs@easa.europa.eu](mailto:ADs@easa.europa.eu).



**SAIB:** NE-09-34

**Date:** June 8, 2009

**SUBJ:** Standard Practices/Structures – Engine Critical Parts Cleaning

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

## **Introduction**

This Special Airworthiness Information Bulletin (SAIB) advises you, registered owners, operators, and certificated repair facilities of **turbine aircraft engines** of the potential of uncontained failure of critical rotating parts due to aggressive grit blast cleaning during routine maintenance. Airworthiness Directive (AD) 2009-10-08 was issued May 4, 2009, to address an uncontained engine event that occurred on a Pratt & Whitney PW2000 engine that was attributed to aggressive grit blast cleaning of a turbine disk. Further FAA review determined that this problem may also exist on other turbine engines if proper procedures are not followed. 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.

## **Background**

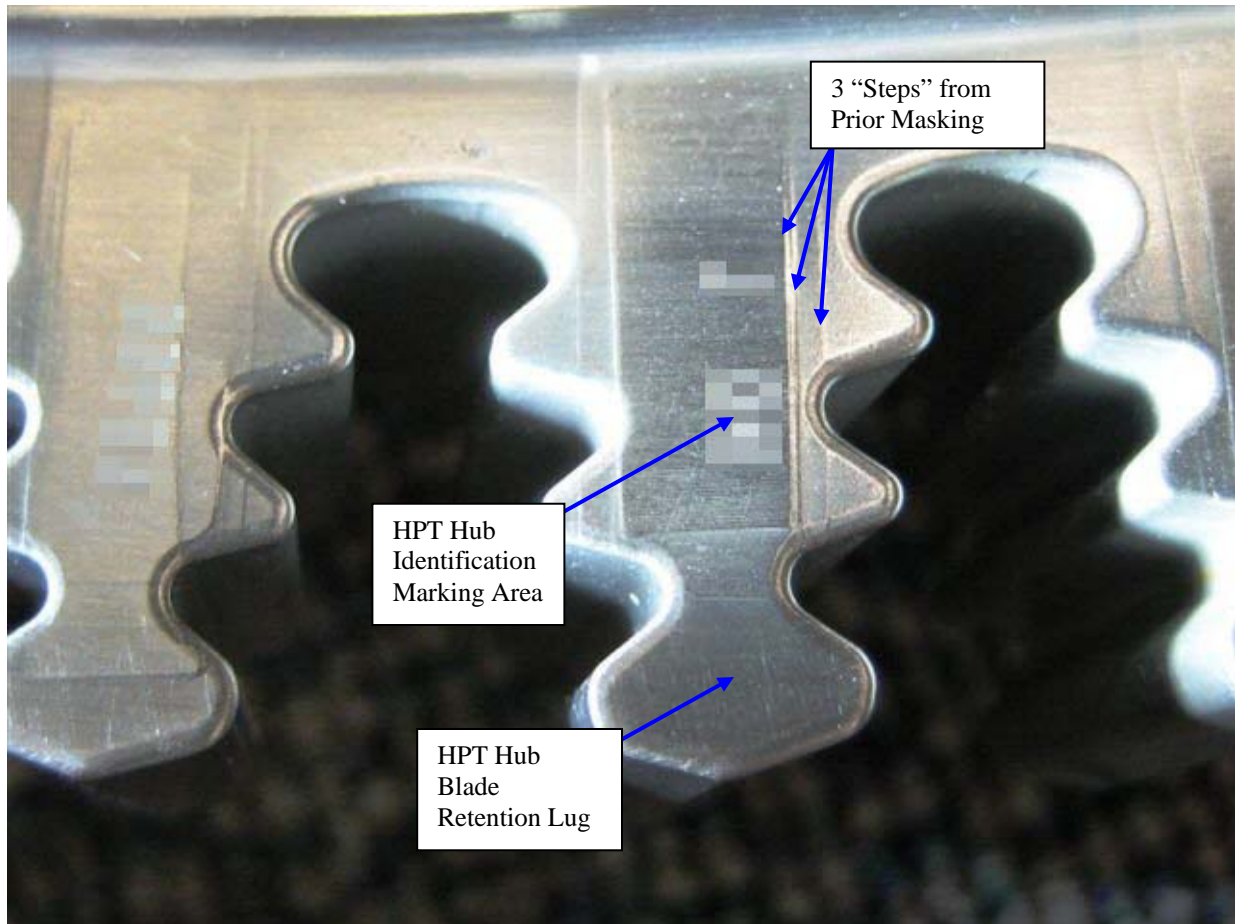
On August 6, 2008, a Pratt & Whitney model PW2037 turbofan engine experienced an uncontained failure of the high-pressure turbine (HPT) 2<sup>nd</sup> stage hub during takeoff. The root cause of the failure was determined to be associated with aggressive grit blast cleaning of the HPT hub at the prior shop visit. The aggressive grit blast removed an excessive amount of material in the hub blade retention lugs, which resulted in a significant increase in stress levels due to uneven loading transmitted by the turbine blades. High stresses resulted in cracking and separation of multiple blade retention lugs of the HPT hub and release of the HPT 2<sup>nd</sup> stage blades. The investigation concluded the root cause of the HPT hub failure to be due to a dimensional discrepancy of the hub blade retention lugs caused by aggressive grit blast cleaning. Further study of the grit blast cleaning procedure showed that excessive material removal can result if the manufacturers recommended control parameters are exceeded. This could also result in similar circumstances on other turbine engine parts that use a grit blast cleaning procedure.

## **Recommendations**

1. Turbine engine repair stations that currently perform grit blast cleaning procedures on critical rotating parts of turbine aircraft engines, should perform a complete and detailed review of their current processes and procedures to ensure they meet the original engine manufacturers intent and include all applicable Warnings and Cautions. This review should also focus on the critical control parameters that can cause excessive material removal (e.g. stand-off distance and dwell time) to ensure they are being controlled properly.
2. Turbine engine repair stations should incorporate recurrent training programs for personnel that perform grit blast cleaning procedures.
3. Turbine engine repair stations should train inspectors and other appropriate personnel to be able to identify turbine engine critical rotating parts that might have been aggressively grit blasted. A visual inspection of part marking areas may provide evidence of potential aggressive grit blasting. If a “step” exists in the part marking area, the part may have been aggressively grit blasted (the step is a result of prior masking of part identification markings prior to performing grit blast cleaning, a typical standard shop practice). The sample photo in

Figure 1 shows a turbine disk that was aggressively grit blasted three times (3 individual “steps” can be seen in the photo).

4. Parts which exhibit this “step” condition, as described in recommendation 3 above, should not be returned to service until a thorough evaluation is performed (which may include an extensive dimensional inspection of the part).
5. Anyone discovering suspected aggressive grit blasting on turbine engine critical rotating parts should forward information documenting the damage to the original engine manufacturer and the FAA Engine Certification Office.



**Figure 1 – HPT Hub Showing Evidence of Aggressive Grit Blast**

**For Further Information Contact**

Mark Riley, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: mark.riley@faa.gov; telephone (781) 238-7758; fax (781) 238-7199.