



ERA19FA071

Atlanta, Georgia

December 20, 2018

Citation 560 – N188CW

NTSB ENGINE EXAMINATIONS REPORT

April 1, 2019

PARTICIPANTS IN THE EXAMINATION

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HISTORY OF FLIGHT

On December 20, 2018, about 1210 eastern standard time, a Cessna C560, N188CW, was destroyed when it impacted a field after takeoff from Fulton County Airport-Brown Field (FTY), Atlanta, Georgia. The air transport pilot and three passengers were fatally injured. The airplane was owned and operated by Chen Aircrafts LLC. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the flight. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91 and had an intended destination of Millington-Memphis Airport (NQA), Millington, Tennessee.

RIGHT ENGINE INFORMATION

Engine Manufacturer: Pratt & Whitney Canada
Engine Model Number: JT15D-5A
Right Engine Serial Number: 108319
Recent Inspection: Overhaul – TT 10,978.1 hours

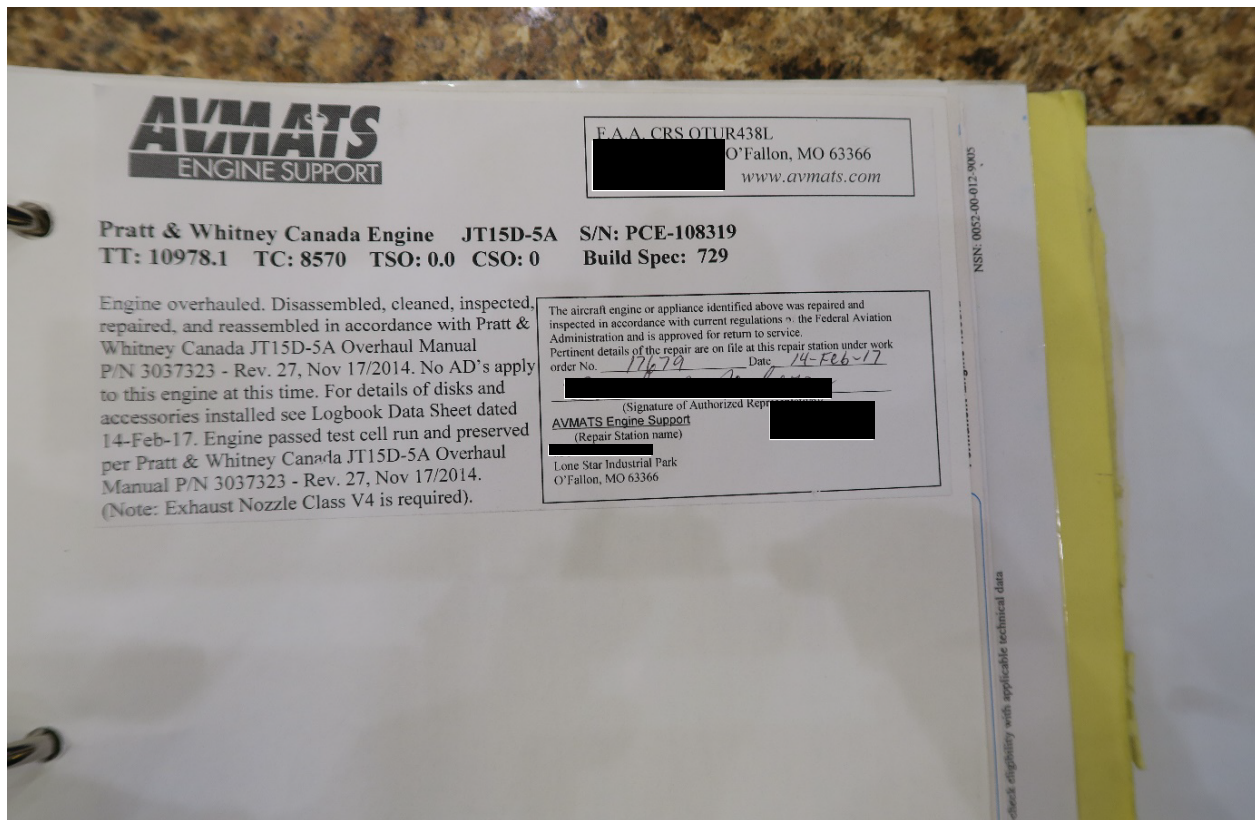


Figure 1. View of most recent right engine maintenance.

RIGHT ENGINE

The engine was received crated and sealed. After removal of the crate, the engine was examined, and the engine cowling was removed.



Figure 2. View of right engine after being removed from the crate.

The inlet cone was removed and rotation scoring was noted on the forward facing part of the cone. The fan was removed and all blades were bent in the opposite direction of travel. In addition, several blades exhibited leading edge gouging and one blade was impact separated. Thermally damaged airframe insulation was noted in the front inner compressor stator.



Figure 3. View of right fan with all blades bent the opposite direction of travel.

The front inner compressor and bypass stators were removed. Several boost rotor blades exhibited leading edge gouging. The low compressor shaft could be rotated by hand after the stators were removed. The boost rotor was removed and debris was noted on the rear inner compressor stator. The boost keys were sheared on the low compressor shaft. Rotational scoring was noted on the trailing edge of the boost blades.



Figure 4. Trailing edge view of boost turbine.

The automatic fuel shutoff valve linkage was in the extended position, which indicated that the fuel shutoff was in the fuel off position, which would stop the fuel flow to the fuel nozzles.

The rear compressor stator was removed and debris was noted in the gas path of the intermediate case.

The impeller could be rotated and debris was noted on the impeller blades.

The exhaust case was removed to access the hot section of the engine. The low-pressure turbine could be rotated by hand and debris was noted on the blades. Furthermore, scoring was noted on the trailing edge of the third stage turbine blades.



Figure 5. Trailing edge view of third stage turbine. Note debris and rotational scoring.

The second stage turbine, third stage stator, and third stage turbine were removed and remained attached to the low turbine shaft. The shaft was separated from the forward section of the low turbine shaft and exhibited a torsional fracture. The second stage low turbine stator was removed and rotational scoring was noted on the forward and aft portions. The trailing edge of the first stage high turbine blades exhibited rotational scoring.



Figure 6. View of second stage turbine and separate shaft.

The throttle body remained attached to the engine. The throttle setting was noted at 90%.



Figure 7. View of throttle setting at 90%.

The fuel filter was removed and no debris was noted in the filter.

The oil filter and oil pressure adjustment valve were impact separated from the engine. The oil filter was removed and the filter was not obstructed.

The fuel/oil heat exchanger was impact separated from the engine.

LEFT ENGINE INFORMATION

Engine Manufacturer: Pratt & Whitney Canada

Engine Model Number: JT15D-5A

Left Engine Serial Number: 108305

Recent Inspection: Engine Minor Inspection – TT 7329.7

Hill Aircraft & Leasing Corp
Atlanta, Georgia 30336
Phone: [redacted]
FAA Repair Station [redacted]

HK HILL AIRCRAFT & LEASING CORP

Date: 7/09/2018; Aircraft: N188CW; Type: CITATION 560; S/N: 560-0148; Hobbs:; Total Time: 7329.70; Engine 1 Type: , S/N:; Time:; Turbine 1, H/S Time: , Cycles: 0; Engine 2, Type: , S/N:; Time:; Turbine 2, H/S Time: , Cycles: 0; Work Done At - Airframe Time: 7329.70,, L/G Cycles: 6044, Shop Order #: MAI-18-03534

Discrepancy: 2
COMPLIED WITH #1 ENGINE VISUAL INSPECTION OF IB & OB EXCITERS. OPS CHECK GOOD. WORK DONE IAW PRATT AND WHITNEY MM 74-10-01.

Discrepancy: 6
COMPLIED WITH #1 ENGINE MINOR INSPECTION. WORK DONE IAW PRATT & WHITNEY M.M., P/N 3037322. NO DISCREPANCIES AT THIS TIME.

Discrepancy: 999
I certify that the above stated maintenance and/or inspection was performed in accordance with 14CFR91.409(f)(3) per Manual P/N ML-C-560 Rev# 5 and is Approved for Return to Service

Signed [redacted] FOR CRS# [redacted] Date 7-9-18

Figure 8. Most recent maintenance on left engine.

LEFT ENGINE

The engine was received crated and sealed. After removal of the crate, the engine was examined, and disassembled for further examination.

The left engine oil filter and oil pressure adjustment valve were impact separated from the engine. The oil filter was removed and was not obstructed.

The fuel control, fuel pump, and bleed valve controller were impact separated. The fuel filter was removed and no debris was noted.

The automatic fuel shutoff valve linkage was in the extended position, which indicated that the fuel shutoff was in the fuel off position, which would stop the fuel flow to the fuel nozzles.

The forward section of the engine was impact damaged and several of the fan blades were impact separated.



Figure 9. View of Left Turbofan.

The exhaust case was removed and rotational scoring was noted on the trailing edge of the third stage low turbine. Rotational scoring was also noted on the second stage shroud. Debris and dirt was noted on the inside of the engine near the third stage turbine. The low turbine shaft was separated and exhibited a torsional fracture.



Figure 10. View of left engine shaft fracture.

The second stage stators and second stage turbine were removed and scoring was noted on the second stage stator. The trailing edge of the first stage high turbine blades exhibited rotational scoring. Debris was noted inside the engine case below the first stage high turbine.



Figure 11. Trailing edge view of first stage turbine. Note debris inside engine and rotational scoring on turbine.

The inlet cone was removed and rotational scoring was noted on the forward section.

The boost turbine was examined and several blades were bent in the opposite direction of travel. All but two of the number 1 bearing housing bolts were separated. The inlet cone shaft was bent and could not be rotated.



Figure 12. View of boost turbine. Note blades bent the opposite direction of travel.

Leading edge gouging was noted on several blades of the impeller. Fan shaft and the HP rotor had limited rotation.



Figure 13. View of left engine impeller.

SUMMARY

The examination revealed that there were no anomalies with the engines that would have precluded normal operation.

FUTURE ACTIVITIES

The engines will be returned to storage at Atlanta Air Recovery in Griffin, Georgia, and kept with the accident airplane in preparation for the release of the wreckage by the National Transportation Safety Board IIC.