



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

May 8, 2019

ENGINE EXAMINATION FIELD INSPECTION REPORT - WPR19LA125

This document contains 14 embedded photos

Accident: WPR19LA125
Location: Sequim, WA
Date: April 28, 2019
Aircraft: Boeing A75N1, N68825
NTSB IIC: Jack Vanover

Participants

Jack Vanover
Aviation Accident Investigator
National Transportation Safety Board

Eric Guterrez
Air Safety Investigator
National Transportation Safety Board

Donald Bacon
Aviation Safety Inspector
Federal Aviation Administration
Des Moines, WA 98198

History of Flight

On April 28, 2019, about 1337 Pacific daylight time, a Boeing A75N1 biplane, N68825, was substantially damaged when it was involved in an accident near Sequim, Washington. The airline transport pilot and the sole passenger sustained minor injuries. The local personal flight was operated in accordance with Title 14 Code of Federal Regulations Part 91.

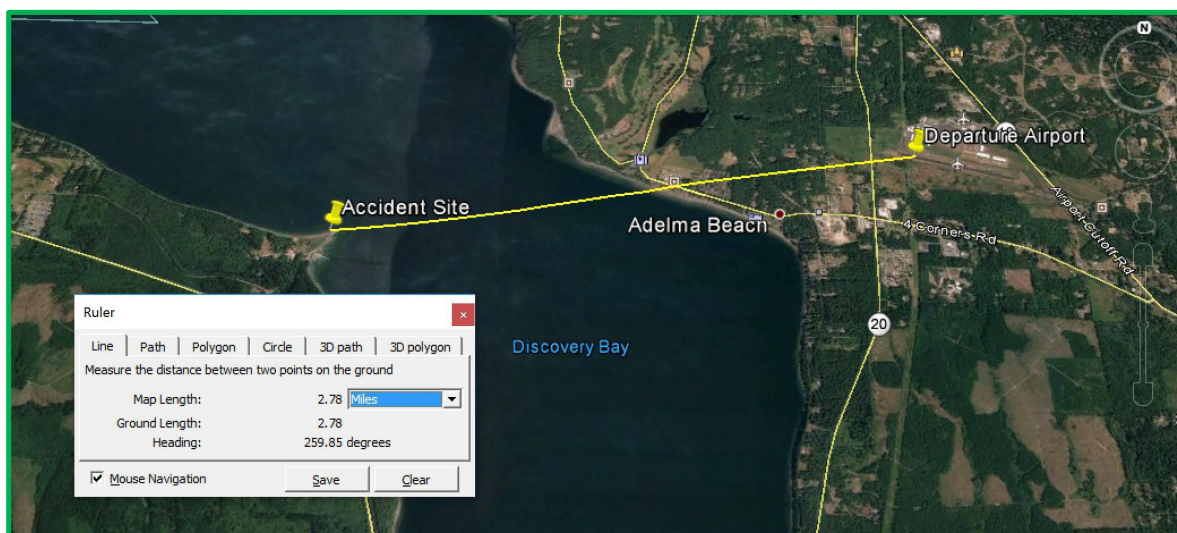


Figure 1: view of accident location

Aircraft Information

The tandem two-seat, fixed-gear biplane, serial number 75-5708, was powered by a Continental W670-6A, 220-hp engine and equipped with a wooden Sensenich PC No INE TCNo 546, serial number AB4797, two-blade fixed-pitch propeller. Review of maintenance records revealed that an annual inspection was completed on August 1, 2018, at a recorded tachometer reading of 555.4 hours, and engine time since major overhaul of 143.2 hours. The tachometer reading during the examination was 560 hours.

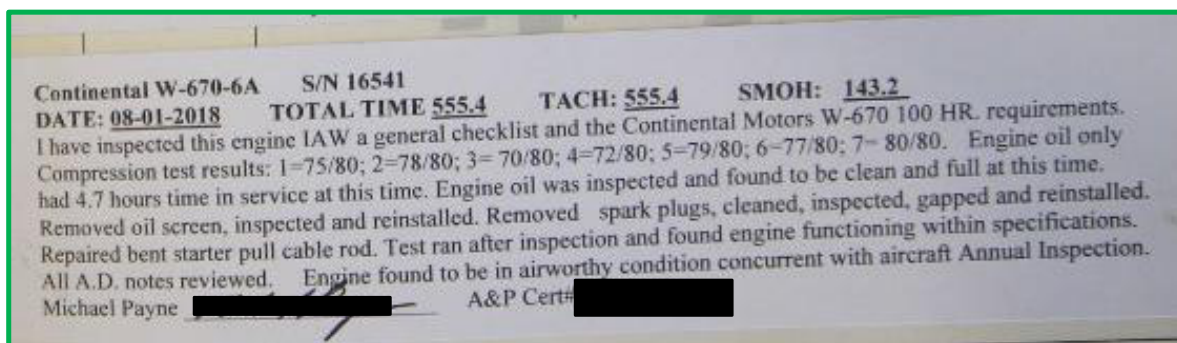


Figure 2: last annual inspection record

The engine was overhauled by Hollaway Repair Station on April 3, 2004 and installed on April 27, 2004.

This engine was completely dissassembled. All Steel components were Magnafluxed and all Aluminum parts were Zyglow inspected. All dimension are with in factory new limits. The cylinders were Nu-Chrome plated by West Coast Cylinder. The Magnetos were overhauled by Bartlett Magnetos. The carburetor was inspected and found serviceable. The engine was assembled using roller bearings front and rear. This was done under STC SE00946LA. The engine was then run on the test stand for 3.2 Hours. The screans were inspected no metal was found. This engine has been found to be airworthey.

Figure 3: excerpt from 2004 engine overhaul 337

Prior to examination

The examination of the engine was performed in a hangar on 059 on May 8, 2019. Government oversight was provided by the NTSB IIC and the FAA IIC.

Both wings and empennage were either damaged during the accident sequence or during the recovery process.

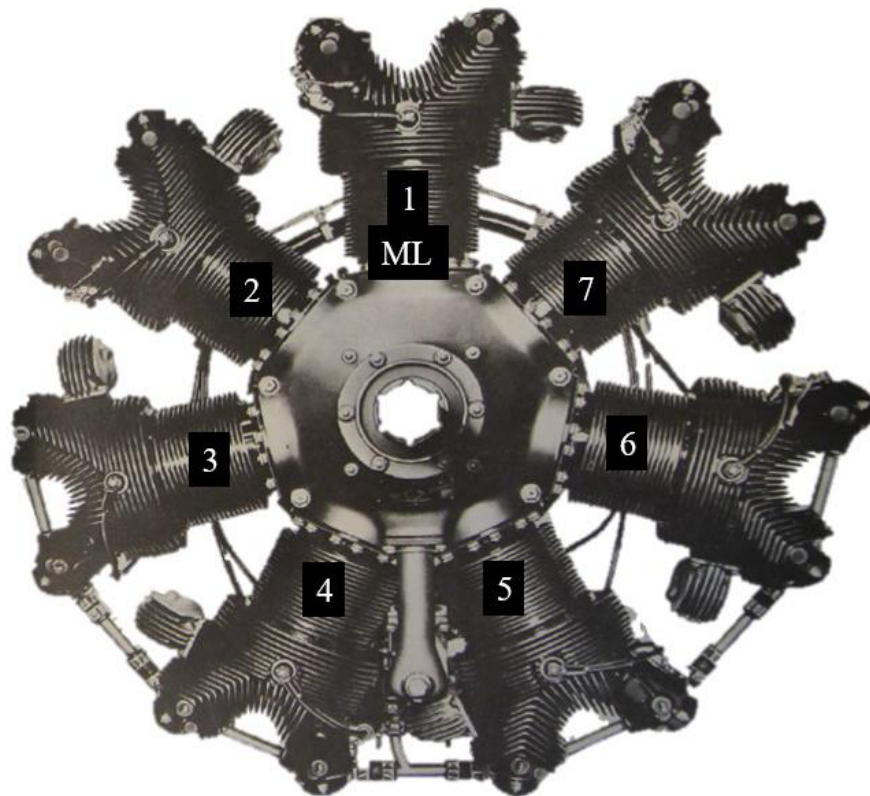


Figure 4: cylinder and master link (ML) location

Prior to the examination the owner of the airplane removed the high-pressure oil screen assembly. Metal flakes were observed on the outside of the screen.

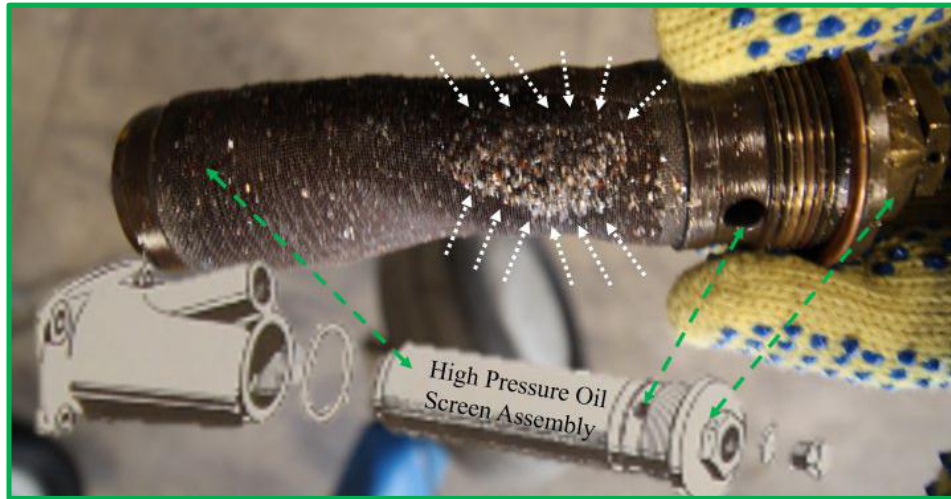


Figure 5: high pressure oil screen assembly

One propeller blade was observed broken about 6 inches from its hub; no other damage was noted to the engine prior to the examination. Oil residue was observed on all surfaces around the engine and fuselage.

Cockpit Observation

The airplane tachometer reading was about 560 – tenths recording could not be read.

The elevator was observed set at 5° nose down.

Engine Examination

The primary ignition leads were removed from the front and back spark plugs. The spark plugs were removed from all cylinders. No. 2 cylinder from and back spark plugs were observed to have been carbon fouled. No. 4 and 5 front and back spark plugs were covered in oil.

The following is a list of the type of spark plug found in the front (F) and back (B).

1B, 2B and 3B are Champion-REM38S

1F, 3F, 4B, 5B, 6B and 7B are Champion-REM40E

2F and 5F are Tempest UREM40E

4F, 6F and 7F are Autolite UREM38E



Figure 6: view of front spark plugs



Figure 7: view of rear spark plugs

Oil was noted at the airlifter housing base. When the airlifter was removed, oil was observed inside. An examination of the air filter intake revealed oil on the outside of the intake screen.

Compressed air (≈ 30 LBS) was applied to the oil system and found to bleed from the base of the crankshaft and forward engine case area.

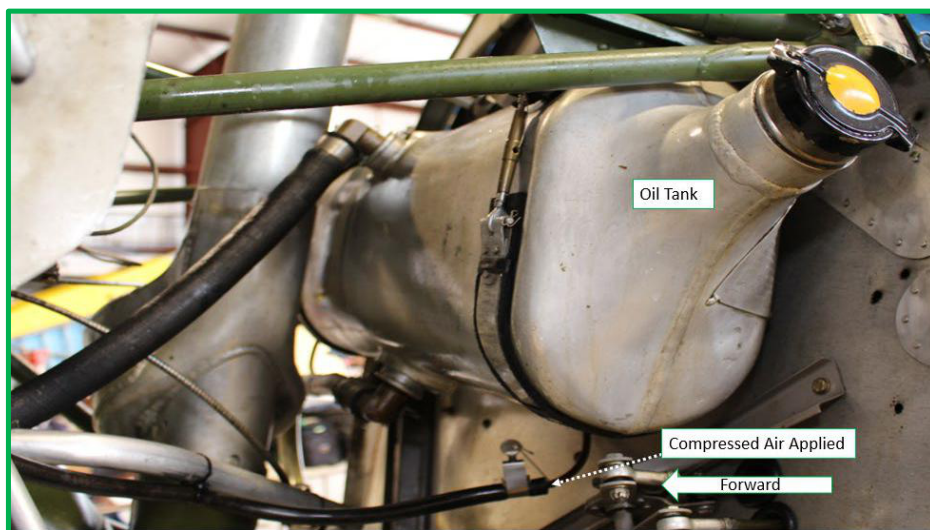


Figure 8: compressed air was applied to the oil system

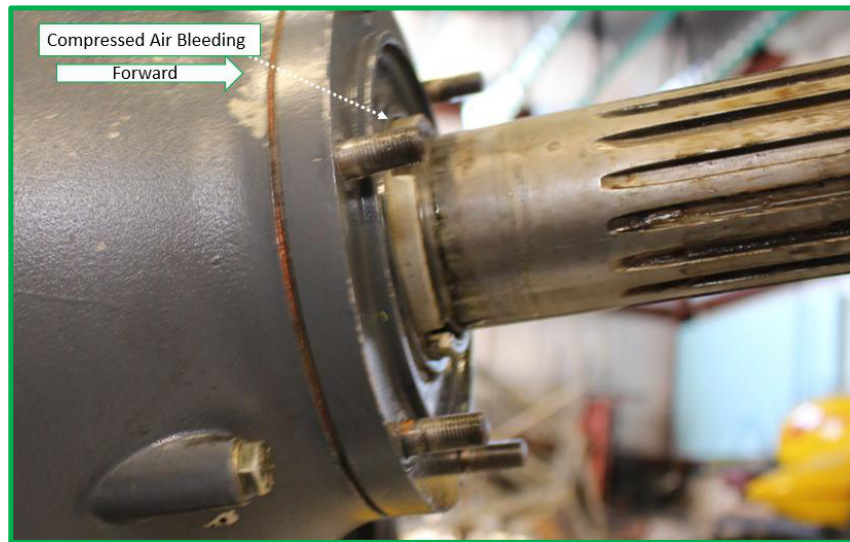


Figure 9: compressed air bleed point

The No. 3 cylinder was removed, which revealed a failure of the crankshaft

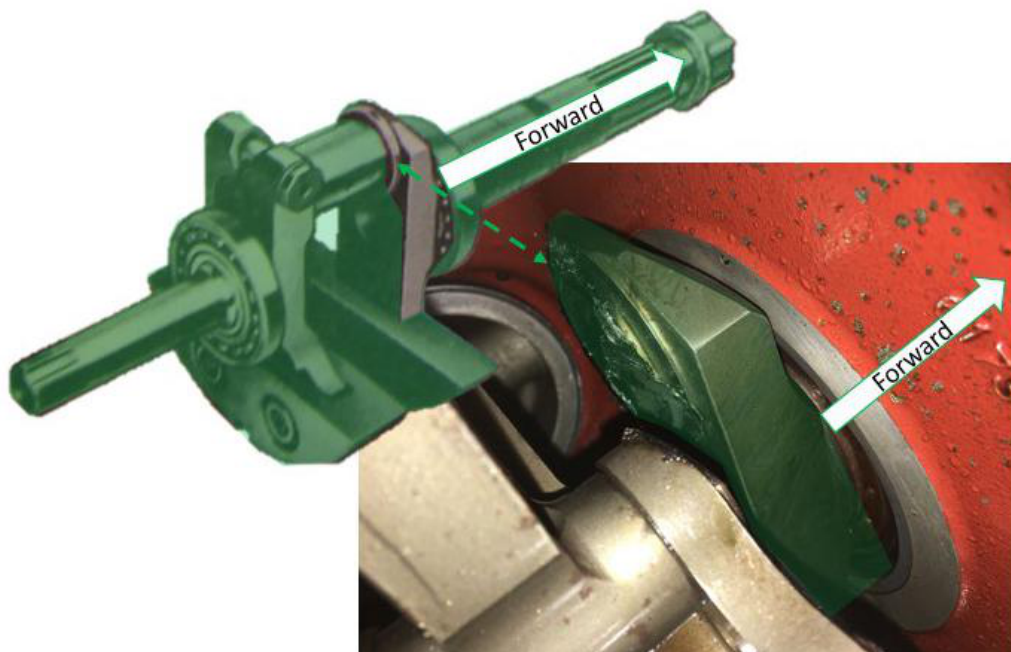


Figure 10: view of crankshaft failure

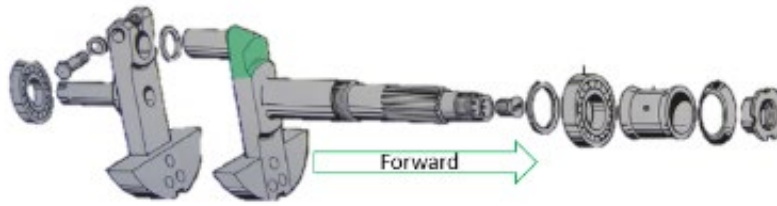


Figure 11: view of failure in relation to crankshaft

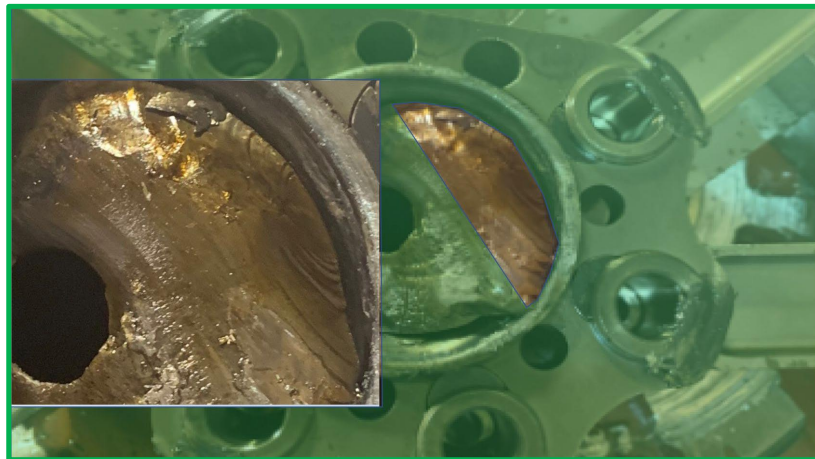


Figure 12: view of failure area

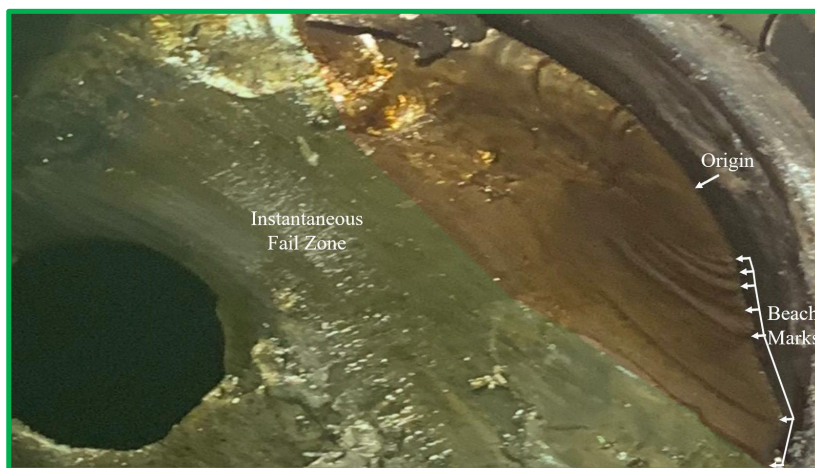


Figure 13: view of beach marks and origin of failure

According to the Continental W670 Overhaul Manual, Section 10, page 55, 1(c), the use of magnaflux inspection is mandatory for all steel parts in the engine, except ball bearings, spring and austenitic steel valves.

According to the engine maintenance records, on April 3, 2004, the engine was disassembled, and all parts were magnafluxed.

INSPECTION & MAINTENANCE RECORD		
DATE	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED AGENCY & CERTIFICATE NO.
4/3/04	3.2	This engine was completely disassembled. All steel parts were Magnafluxed all Aluminum Parts were Dyed and inspected. All dimensions are within in new limits. The engine was assembled using Roller Bearings front & Rear under STC SE009446LA This engine was run on TLE Test Stand for 3.2 Hrs. Sensors were checked no metal was found This engine has been found to be Airworthy Repair Station [REDACTED]

figure 14: excerpt of engine maintenance record entry of magnaflux of all steel parts