

Report of Findings

Date of accident: March 11 2017
Location of accident: Oakdale CA
Aircraft registration: N2621T
Aircraft type: Challenger 11
Engine type and S/N: Rotax 582 Mod 99 S/N 4172984
NTSB or TSB file number: WPR17FA077
Date of Report: May 2 2017
File number: 2017-009

Original Accident Location;

- Oakdale Municipal Airport (O27), Oakdale, California

Preliminary engine inspection

Inspection carried out at: Plain Parts near Sacramento, CA.

Date of inspection: May 2 2017

Persons in attendance

Oversight by NTSB/FAA personnel:

- NTSB Aviation Accident Investigator, Mr. Andrew Swick from the Western Pacific Region.
- RFS Chief Accident Investigator, Mr. Jordan Paskevich from British Columbia, Canada

ENGINE

Rotax Engine Model Number: Rotax 582 Mod 99

Rotax engine serial number: 4172984

OVERVIEW

See NTSB Preliminary Report for details

Initial condition of engine as presented prior to detailed inspection

- Engine found separated from aircraft and damaged from post-impact fire
- Engine still attached to engine mount of aircraft
- Propeller Belt drive system (pulley's & mount) still attached to engine (Belt consumed by post-impact fire)
- Exhaust system still attached to engine and appears undamaged from post impact fire
- 3 blades from the propeller broken off approximately 12" from hub. All blades broken off evenly from rotational impact and severely damaged from post impact fire.
- Ignition system consumed by post-impact fire
- Coolant system (radiator and hoses) consumed by post-impact fire
- Electrical system (magneto and flywheel pick up) consumed by post-impact fire
- Ignition housing broken and damaged from post-impact fire.
- Carburetors displaced from engine and carb sockets consumed by post-impact fire
- Induction system severely damaged from post impact fire and partially consumed by fire.
- Two of the three broken propeller blade tips (approximately 12" in length) were undamaged by fire and showed signs of rotational impact damage on the leading edge. The 3rd blade was not present during examination.
- All 4 spark plugs were damaged from post impact fire.

Detailed Engine Inspection

Spark Plugs & Spark plug Caps

NOTE: PTO (Power take-off) is the combustion chamber (cylinder) closest to the propeller. MAG (Magneto) is the combustion chamber (cylinder) closest to the magneto side of engine.

NOTE: Two spark plugs per cylinder. #1 and #2 PTO spark plugs share the same combustion chamber (cylinder), as does #3 and #4 MAG spark plugs share the same combustion chamber (cylinder).

- NGK Iridium BR8ETX Fine Point spark plugs installed (Non-Standard). Standard spark plugs for this engine is NGK BR8ES with non-removable resistor cap.

#1 PTO spark plug gap – 0.020

#3 MAG spark plug gap – 0.020

#2 PTO spark plug gap – 0.020

#4 MAG spark plug gap – 0.020

- All spark plugs were damaged from the post impact fire.
- PTO #1 spark plug, MAG #3 & 4 Spark plug electrodes showed normal burn pattern, good fuel to air ratio (not overly rich or lean) and not oil fowled.
- PTO #2 spark plug appeared wet with a black (dark) electrode.

Ignition System

- The ignition system was consumed by the post impact fire and could not be examined.

Fuel System including carb inspection and fuel lines

- The fuel system including both MAG & PTO carburetors and fuel lines were consumed by the post impact fire and could not be examined.

Fuel supply including fuel pump

- The fuel supply including the fuel pump was consumed by the post impact fire and could not be examined.

Lubrication system

- The fuel lubrication system i.e., Oil tank, oil injection system and oil lines were consumed by the post impact fire and could not be examined.

Cylinder and cylinder head

- The cylinder head was removed from the MAG & PTO cylinders and examined for condition and conformity. Other than fire damage from the post impact fire, no anomalies were seen with the cylinder head.
- The tops of the pistons were examined and found to be in good condition with no anomalies seen.
- The cylinders were removed and the pistons were fully examined. No anomalies were seen with the pistons.
- The cylinders were examined and found to be in good condition with good cross hatching and no signs of oil starvation, excessive heat or metal transfer.
- Oil lubrication could be seen throughout the engine.

Rotary Valve

- The rotary valve cover was damaged from the post impact fire. The cover was removed and the rotary valve was examined for condition. No anomalies were seen with the Rotary valve system.

Cooling system

- The coolant system was consumed by the post impact fire and could not be fully examined. No anomalies were seen with the remaining components of the cooling system i.e. Water pump, coolant elbows, coolant chambers in the cylinders and cylinder heads.

Air Filter system

- Consumed by the post impact fire. Could not examine.

Exhaust system

The exhaust system was removed and examined. No anomalies were seen with the exhaust system.

Gearbox

This aircraft was not equipped with a Rotax gearbox. The aircraft manufacture requires the use of an aftermarket belt drive system. No anomalies were found with this belt drive pulley system. The belt was consumed by the post impact fire and was examined.

Crankcase and crankshaft

The crankshaft could not be rotated due to the post impact fire damage of the crank case. Examination of the crankshaft was done through the connecting rod ports. Other than fire damage, no anomalies were seen with the crankcase or crankshaft.

Summary:

No mechanical I anomalies were found of the available engine and its components during the examination. Evidence that the engine was running at the time of the accident could be seen on the remaining propeller blades that were found separated from the wreckage.