

Report of Findings

Date of accident: October 21st 2022
Location of accident: Tyler Texas, USA
Aircraft registration: N86GV
Aircraft type: Vans RV12
Engine type and S/N: Rotax 912ULS-2 S/N 6780081
NTSB file number: U/K
Date of Report: May 11th 2023
File number: 2022-027

Original Accident Location:

Tyler Texas

Preliminary engine inspection:

Inspection carried out at: Air Salvage of Dallas

Date of inspection: May 11th, 2023

Persons in attendance

- Jordan Paskevich – Rotech Flight Safety – Rotax
- Fritz Bayer – ASI – FAA
- Dan Montie – ASI - FAA

ENGINE

Rotax Engine Model Number: Rotax 912ULS 2

Rotax engine serial number: 6780081

OVERVIEW

See NTSB Preliminary Report

Initial condition of Engine as presented prior to detailed inspection

- The aircraft has suffered significant damage.
- The engine has become detached from the aircraft and firewall.
- The Rotax 912ULS engine has sustained substantial damage.
- The engine is covered in mud.
- The carburetors and intake manifolds have been displaced from the engine.
- The fuel pump has broken off at its base.
- The exhaust system is partially separated from the engine.
- The oil filter has broken off at the oil pump.
- The ignition system has incurred impact damage.
- The oil cooler and oil lines have been breached.
- The coolant system has also been breached.

Detailed Engine Inspection

Spark Plugs & Spark plug Caps

- The spark plugs have sustained impact damage.
- The spark plugs used were NGK DPR8E.
- All plugs have white electrodes and are in good condition.
- The plug wires have been damaged and pulled away from the spark plug boots as a result of the impact.

Ignition System

- The ignition system has been damaged as a result of the impact.
- Due to the condition of the system, it was not possible to conduct any testing.
- The spark plugs did not show any indications of issues related to the ignition system.

Fuel System including carb inspection and fuel lines

- The carburetors were not available for examination.
- The fuel lines were also not available for examination.

Fuel supply including fuel pump

- The mechanical fuel pump has been broken off at its base and was not available for examination.

Lubrication system

- The oil tank and oil lines were not available for examination.
- The oil cooler was also not available for examination.
- The oil system has been breached as a result of the impact.
- There is no evidence of oil starvation detected.

Cylinder and cylinder head

- The cylinders and cylinder heads were removed and inspected.
- The combustion chambers were found to be filled with Foreign Object Debris (FOD) resulting from the impact, specifically mud and water.
- No anomalies were detected in the cylinders or cylinder heads that would hinder normal operation.

Cooling system

- The water pump remains intact and undamaged from the impact.
- The coolant lines have been breached, and the expansion chamber was not available for examination.
- The coolant radiator was also not available for examination

Air Filter system

- Not present for examination

Exhaust system

- The exhaust system has sustained damage as a result of the impact.
- The exhaust muffler can was not available for examination.

Gearbox

- The gearbox was removed and internally examined.
- The gearbox has suffered frontal impact damage, causing the propeller shaft to be pushed aft into the crankcase.
- The small gear located within the gearbox made contact with the crankcase, resulting in visible metal transfer.
- A swiping motion indicated that the engine was running at the time of impact.

Crankcase and crankshaft

- An attempt to rotate the crankshaft was unsuccessful due to the engine's submersion in water, resulting in internal corrosion.
- No anomalies were observed with the crankcase or the crankshaft.

Summary

An investigation into the aircraft accident involving registration N86GV, a Vans RV12, reveals significant damage to the aircraft and engine. The engine was found detached from the aircraft and firewall, with various components damaged. The carburetors, fuel pump, exhaust system, oil filter, ignition system, oil cooler, and coolant system were all impacted. The spark plugs showed damage, but no issues with the ignition system were detected. The fuel system, lubrication system (including oil tank and lines), and air filter were not available for examination. The cooling system suffered breaches in the coolant lines, and the coolant radiator and expansion chamber were not accessible. The gearbox experienced frontal impact damage, indicating the engine was running during the incident. Although the crankshaft could not be rotated due to water submersion and internal corrosion, no anomalies were observed in the crankcase or crankshaft.

Evidence of Engine Running at Time of Impact:

Based on visible metal transfer observed during the examination of the gearbox, it was determined that the small gear within the gearbox made contact with the crankcase. The swiping motion of the metal transfer indicated that the engine was running at the time of impact. This evidence suggests that the engine was operational during the accident.