

# National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23FA286

## **ENGINE EXAMINATION SUMMARY REPORT**

Factual Report

March 26, 2025

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## **A. ACCIDENT**

Location: Glendive, Montana  
Date: 07/28/2023  
Time: 1410 Local  
Airplane: N2442; A VAN NIEROP RISEN 915iS

## **B. PARTICIPANTS**

IIC Scott Johnson  
NTSB AS-WPR  
Coeur d' Alene, Idaho

Subject Matter Expert Jordan Paskevich  
Rotax-Rotech Flight Safety  
Vernon, British Columbia, Canada

## C. DETAILS OF THE EXAMINATION

### 1.0 Engine Inspection

The engine was removed and transported from the accident site by the Glendive airport manager for storage for transport. NTSB international shipping to Canada was lengthy. The engine was shipped to Rotech Motor Ltd, at the Vernon Regional Airport, Vernon, British Columbia, in Canada. The follow-up examination was conducted on March 26, 2025, with the NTSB-IIC and Rotax investigator in attendance. The shipping box was undamaged in Canada.



**Figure 1 Crated Engine**

Model number: ROTAX 915 iS A 3  
Serial number: 9133788  
Production Year: 09.11.2021

The propeller assembly remained attached to the crankshaft propeller flange. The reduction gearbox had one of two blades cut off for shipping and the other sheared off from impact damage. The airplane and engine sustained post impact fire which consumed most of the airplane.

The left side of the engine appeared to have been exposed to less heat than the right side of the engine. The non-Rotax radiator had been relocated at the rear of the engine with a turbocharger and remained attached to their mounting points and were fire damaged. The intake system and turbocharger line were consumed by post impact fire. The ignition system was damaged and consumed by post impact fire. A portion of the engine support structure remained attached to the engine mounts.

The reduction gearbox assembly appeared in good condition. The oil filter, oil tank and oil cooler all had impact damage. The oil lines were fire damaged but were connected to their attachment points. Oil was observed dripping from the bottom of the engine. In maneuvering the engine about ¼ quart of oil was collected. The coolant radiator and lines had impact damage but remained attached to their connection points.



**Figure 2 Engine with reduction gearbox attached**

## 2.0 Engine Examination

### Spark plugs and ignition:

The spark plugs were removed from each of the cylinders. The spark plug electrode areas had normal amounts of combustion deposits and coloring. The ignition system (ignition modules/coils, wires) was substantially damaged and partially consumed by the post-impact fire.



**Figure 3 Cylinder spark plugs**

### Fuel system:

The fuel feed line to the fuel injection rail and the fuel return line from the fuel pressure regulator were consumed by the post-impact fire. The fuel injectors remained attached to the intake manifolds; however, they were damaged from the post-impact fire. The fuel injector power wires were damaged from the post-impact fire.

### Lubrication system:

The oil pump was damaged from the impact, and the oil filter was displaced from the oil pump and damaged by the post-impact fire. The oil tank remained attached and connected; however, it was damaged from the impact.

Oil lubrication was found throughout the engine, and there were no signs of oil starvation or an oil system issue. The oil lines were still connected to their respective connection points; however, they were damaged by the post-impact fire. The oil cooler was crushed and substantially damaged by the impact.



**Figure 3 Cylinder removal**



**Figure 4 Hardness Test**

#### Cylinder and Cylinder head:

The valve covers were removed from the cylinder heads.

The cylinder heads were removed from the engine and examined. No anomalies were found with the cylinder heads, as they appeared to be in good physical condition.

Evidence existed of engine over temp limit issues that the pilot was sorting out with the manufacture. A hardness test was conducted on the cylinder heads. All the cylinders passed the test. The excessive temperatures the engine experienced were as a result of post-impact fire.

#### Cooling system:

The coolant radiator was damaged from the impact, and the coolant lines were damaged by the post-impact fire. The coolant system was breached, and there was no evidence of coolant within the system.

The cylinder heads were liquid-cooled and passed the hardness test, indicating that the cooling system was functioning prior to the impact.

## Exhaust system:

The exhaust and turbo system were relocated from its original stock position. The exhaust and turbo system sustained substantial damage from the impact. The four exhaust pipes were covered by heat wrap.

## Gearbox:

The propeller assembly was attached to the crankshaft propeller flange. Only one of two of the composite propeller blades remained and was fractured at the propeller hub with the other cut off for shipping. The cut blade had 2/3 of it burned during the post-impact fire. This evidence likely suggests the engine was developing power at the time of impact.

The reduction gearbox was in good physical condition and rotated easily without binding. The gearbox was removed and inspected. The internal gearset appeared to have been adequately lubricated, and there were no signs of pre-impact mechanical failure.



**Figure 5 Engine with reduction gearbox removed**

Crankcase, crankshaft and camshaft:

The crankcase was inspected and found to be in good physical condition with no anomalies observed. The crankshaft was inspected and found to be in good condition, with no signs of damage from oil starvation or excessive heat.

The crankshaft rotated with ease once interference from the reduction gearbox was cleared. The camshaft was examined and was found to be in good condition, with no evidence of oil starvation or excessive wear/pitting on the cam lobes. No anomalies were discovered with the crankcase, crankshaft, or camshaft.

ECU Data:

The Engine Control Unit (ECU) was fire damaged, and no data was extracted.

### **3.0 Summary of Engine Examination**

The engine sustained significant damage during impact and post-impact fire. There were no preaccident mechanical failures or malfunctions found with the engine that would have precluded normal operation.

Submitted by:

Scott Johnson  
Air Safety Investigator