



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

July 23, 2021

ENGINE EXAMINATION SUMMARY

WPR21LA173

This document contains 3 embedded photos.

A. ACCIDENT

Location:	Santa Fe, New Mexico
Date:	April 22, 2021
Aircraft:	N378CT Flight Design GMBH, CSTW light sport
NTSB IIC	Albert Nixon

B. PARTICIPANTS

Albert Nixon
Senior Aviation Accident Investigator
National Transportation Safety Board
Federal Way, WA

Ray Romero
Aviation Safety Inspector
Federal Aviation Administration
Albuquerque, NM

Jordan Paskevich
Rotech Flight Safety Inc.
Chief Accident Investigator
Rotax Aircraft Engines
Vernon B.C., Canada

C. SUMMARY

Examination of the engine was accomplished at a hanger located at the Santa Fe Municipal Airport, (SAF) Santa Fe, New Mexico. The postaccident examination of the engine revealed a leak in the oil line from the oil tank to the oil pump. No additional preimpact anomalies or malfunctions were found that would prelude normal operation.

D. DETAILS OF THE INVESTIGATION

1.0 Engine Examination

The engine was attached to the fuselage and all the accessories were attached and appeared intact. The only damage observed was to the propeller. The propeller remained attached to propeller flange. Observation of the composite three-bladed propellor revealed that one blade was separated, about 8 inches from the hub. The other two blades sustained leading-edge damage.



Figure 1: Engine as viewed from the front left side.

Manual rotation of the crankshaft was attempted by rotating the propeller but was unsuccessful due to internal binding. No external damage was noted on the engine. No breaches of the coolant and oil system was initially observed. The rocker covers were removed, and the valves springs and rocker arms showed that a minimal amount of oil was contained within the rocker covers. The magnetic plug was removed and examined. Examination revealed that an excessive amount of magnetic material was captured by the plug. All 8 spark plugs were removed, and examination revealed no anomalies and normal wear indications. The fuel pump was removed, and examination revealed no anomalies. The propeller hub was then removed from the gearbox flange. The gearbox was removed, and examination revealed a small piece of material consistent with bearing material was contained within the gearbox.

The gearbox propeller shaft was rotated by hand within the gearbox and the movement was not smooth. No internal damage was observed on the internal components of the gearbox. The coolant checked full and then the system was drained, and no anomalies were noted. The No. 2 cylinder head was removed and the valves, cylinder head, were examined and no anomalies were noted. Minimal oil was contained in the No. 2 cylinder. The No. 1 cylinder head was removed and examined, and no anomalies noted. The Nos. 1 and 2 cylinders were removed and examined; the cylinder walls appeared dry; however, no scoring or metal transfer was observed.

The oil filter was removed. The filter was observed to be an aftermarket, non-approved filter by Rotax. Additionally, minimal oil was contained within the filter. The oil pump was removed disassembled and examined. Examination was revealed no anomalies and when the oil pump was manually rotated, oil was dispersed from the oil pump outlet. The oil pressure line from the oil tank to the oil pump, which supplied oil to the engine, was examined. Examination revealed that once compressed air pressure was introduced into the line, a leak was observed where the oil line was resting against the exhaust manifold.

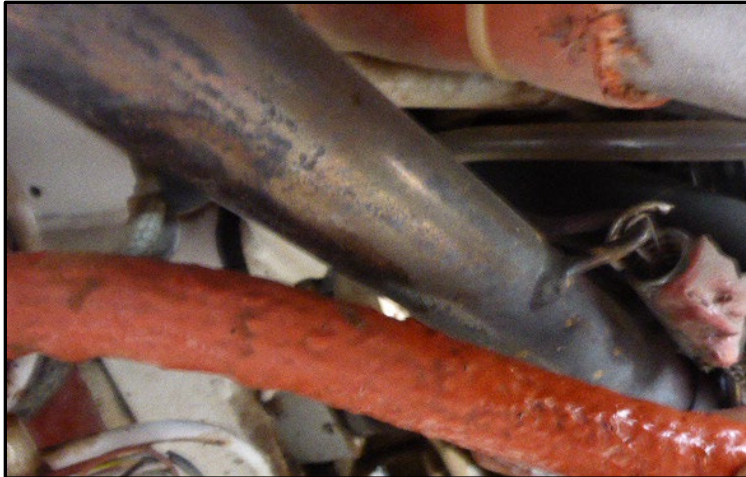


Figure 2: Oil line resting against exhaust manifold.



Figure 3: Oil line damaged by resting against exhaust manifold.

Submitted by Albert Nixon