

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN24FA028

ENGINE EXAMINATION

April 2, 2025

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. ENGINE EXAMINATION.....	3
C. SUMMARY.....	3
D. DETAILS OF THE EXAMINATION.....	3
1.0 ENGINE.....	4

A. ACCIDENT

Location: McCook, NE
Date: October 30, 2023
Time: 1200 CDT
1700 UTC
Airplane: Piper PA46-350P

B. ENGINE EXAMINATION

IIC	Jason Aguilera NTSB Aurora, CO
Party Member	Johnathon Hirsch Piper Aircraft
Technical Advisor	Mike Hodge Pratt & Whitney Canada

C. SUMMARY

Follow-up engine examination for N510KC.

D. DETAILS OF THE EXAMINATION

1.0 Engine

The accident airplane had been modified via supplemental type certificate for the installation of a Pratt & Whitney Canada PT6A-21, s/n PCE-PE0698. After the airplane was recovered, the engine was separated from the fuselage for examination. The engine was placed on an engine hoist and disassembled.



Figure 1 Engine Prior to Disassembly

The power section and gas generator could not be rotated by hand. Once the power section module was separated, the gas generator section would rotate normally. There was evidence that the power turbine vane ring center bore had machined to compressor turbine disk.



Figure 2 Power Turbine Section

The compressor turbine section had evidence of rotational scoring on both the upstream and downstream sides of the disk. All blade remained attached and the trailing edge of the blades had secondary impact damage.



Figure 3 Compressor Turbine Disk

The gas generator oil magnetic chip detector was removed and found to be clean. The fuel filter and P3 filter were removed and found to be clear of debris. All P3/PY lines were properly secured, torqued, and safety wired. There was evidence of moisture in one of the P3 lines.

The power turbine disk had rotational scoring on both the upstream and downstream sides of the disk. Multiple blades were fractured with varying heights, all showing evidence of overload fractures. The blades were displaced rearward in the disk.



Figure 4 Power Turbine Disk

The reduction gearbox was removed from the exhaust duct and continuity was present to the accessory sub assembly.

The fuel control unit and fuel pump were removed from the engine. The FCU was compromised and the internal components exposed, but all portion remained attached together.



Figure 5 Fuel Control Unit and Fuel Pump Assembly

The airframe fuel filter, oil filter, and fuel pump filter were all removed and found clear of contaminants.

The power section was further examined. The coupling between the PT shaft and 1st stage sun gear fractured/compromised and rotational could not be obtained through the rotor balancing assembly.

The RBG chip detector was removed and found clean.

The compressor bleed off valve was found in the open position. The piston could be moved freely and had environmental debris on its surface.

Impeller vanes viewed through the bleed slot with a borescope showed rubbing on the blade tips and environmental debris in the area.



Figure 6 Impeller Vanes

The fuel nozzles, ignitors, and combustion chamber were removed from the gas generator, with no defects noted. Environmental debris was found in the large exit duct.

No anomalies were detected with the engine during the examination. The FCU and fuel pump will be sent to P&WC for further examination. The propeller governor will be sent to Woodward for further examination.

Submitted by:

Jason Aguilera
NTSB, Investigator-in-Charge