

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA23LA037

AIRWORTHINESS FACTUAL REPORT

October 6, 2023

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. AIRWORTHINESS FACTUAL REPORT.....	3
C. SUMMARY.....	3
D. DETAILS OF THE INVESTIGATION	3
E. MAINTENANCE RECORDS	4
F. ENGINE EXAMINATION.....	5
G. AIRFRAME EXAMINATION.....	6
H. ADDITIONAL INFORMATION.....	6
I. PHOTOGRAPHS AND FIGURES	6

A. ACCIDENT

Location: Spartanburg, South Carolina
Date: October 23, 2022
Time: 1700 Local
2100 UTC
Airplane: Piper PA28-235, N8580N

B. AIRWORTHINESS FACTUAL REPORT

NTSB IIC Adam Gerhardt
National Transportation Safety Board
Washington, DC

Party Member James Jackson
Federal Aviation Administration
West Columbia, South Carolina

Party Member James Childers
Lycoming Engines
Williamsport, Pennsylvania

Party Member Robert Martellotti
Piper Aircraft
Vero Beach, Florida

C. SUMMARY

On October 23, 2022, about 1700 eastern daylight time, a Piper PA28-235 airplane, N8580N, was substantially damaged when it was involved in an accident near the Spartanburg Downtown Memorial Airport (SPA), Spartanburg, South Carolina. The private pilot and three passengers were not injured. The airplane was operated by the pilot as a personal flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

D. DETAILS OF THE INVESTIGATION

The NTSB investigator-in-charge traveled to the SPA airport on December 6, 2022, and was assisted by Lycoming, Piper, and FAA party members. The wreckage and maintenance records were examined. This document contains the factual findings related to the examination.

E. MAINTENANCE RECORDS

The most recent annual inspection occurred on February 15, 2022, at tachometer time of 4034.96. The hour meter at the time of the accident was 4069.49, resulting in 34.53 tachometer hours flown since the last annual inspection.

Within the engine logbook, on January 2, 2021, a propeller strike airworthiness directive (AD "04-10-14C1 1") was noted as complied¹ with as part of a 100-hour inspection. The engine serial number was noted as "L-11317". This serial number did not match the number located on the engine data plate (L-15252-40) observed during the examination. Within the propeller maintenance logbook, on January 2, 2021, the propeller was inspected as part of a 100 hour inspection. Within the maintenance endorsement, the propeller model number was noted as HC-C3YF-1RF, and the serial number noted was "DY754913". This number did not match the serial number located on the propeller hub ("DY7549B").

The mechanic that completed the January 2, 2021 maintenance was interviewed. He reported that he was not aware of any propeller strike. He reported that it is his normal practice to record that the AD 04-10-14C1 1 was completed on every annual or 100-hour inspection, due to the broad definition of propeller strike. He further clarified that no work was performed to the crankshaft gear retaining bolt and he saw no evidence that a propeller strike had occurred.

The engine was last overhauled on May 2, 2003, 1569.49 hours prior to the accident. Excerpts of the maintenance records are located in the public docket.

On July 6, 2015, an annual endorsement noted compliance with AD 2004-10-14, however, the endorsement did not note whether any components on the crankshaft drive gear were inspected or replaced. On December 17, 2015, the left and right magnetos were replaced with new magnetos.

The engine was last overhauled on May 2, 2003, 1569.49 hours prior to the accident. The SB 475C had been issued prior to this overhaul, and the maintenance endorsement noted that all applicable service bulletins had been complied, however, a specific reference to No. 475C was not stated in the endorsement.

According to the owner of the airplane, who was the accident pilot, he purchased the airplane in 2015 and was not aware of any propeller strikes with the airplane.

¹ In January 2003, Lycoming published Mandatory Service Bulletin (SB) No. 475C, Crankshaft Gear Modification and Assembly Procedures. In 2004, the FAA subsequently issued an airworthiness directive (AD) for propeller strikes (AD 2004-10-14) in which the compliance section referred to SB 475C.

F. ENGINE EXAMINATION

The engine was a Lycoming O-540-B4B5, serial number L-15252-40, 235-horsepower engine.

The engine displayed sooting and thermal damage. There was thermal damage to the engine cowling, with heavier thermal damage noted to the lower right side. Oil staining was found inside the lower area of the engine cowling, on the front area of the heater muff and in the area of the air filter and carburetor air box assembly. The air filter was partially melted. The alternator was thermally discolored.

On-scene photos noted oil inside the bottom area of the engine cowling. Oil staining was observed on the front area of the heater muff and residual oil was noted in the area of the air filter and carburetor air box assembly. Fire extinguishers were used to put out a fire in the cowling area.

The engine displayed no visible impact related damage. The right magneto was found attached to the accessory section. It was rotated, and spark was noted on all cut leads. The left magneto's exterior casing was found fractured and partially rotated from its normal attachment points. It had a bent drive shaft and could not be rotated.

Piston movement was noted to all pistons during rotation of the propeller flange by hand. Valve train continuity was established from the camshaft to the valve train. The engine driven fuel pump was field tested and was operational. Fuel, green in color, was noted in the carburetor. The oil pump was rotated with no restriction. Crankshaft continuity was not confirmed, with the movement of the propeller flange by hand.

The accessory section of the engine was removed. The left idler gear was damaged and missing three gear teeth, and the left magneto drive gear was damaged and missing one gear tooth. The crankshaft gear was partially separated from the crankshaft. The crankshaft gear bolt was partially backed out from its normal position and its bottom few threads were stripped. The safety clip remained attached. The crankshaft rotated however the crankshaft gear did not. The crankshaft gear dowel had sheared.

One propeller blade tip noted black marks on the front side and a small section of the tip damage was consistent with arc damage². One other blade outboard leading edge was abraded, and the last blade had no visible damage.

² The airplane struck live powerlines during the emergency landing to a city street.

G. AIRFRAME EXAMINATION

Flight control continuity was established from the primary flight control surfaces to the control column. Several switch positions and power control levers had been moved postaccident and were not considered to be a reliable indication of what was set during the accident. Both left and right main gear assemblies received impact damage consisted with wire strike.

The lower section of the rudder was cut, and in the same general area, the right lower aft section of the vertical fin and right aft section of the fuselage noted a diagonal black transfer marks consistent with a wire strike.

No airframe anomalies were noted that would have precluded normal operation prior to the off-airport emergency landing.

H. ADDITIONAL INFORMATION

The left and right idler gears, the left magneto and drive gear, crankshaft gear and bolt were sent to the National Transportation Safety Board Materials Laboratory for metallurgical examination. Refer to the Materials Laboratory report in the public docket for additional information.

I. PHOTOGRAPHS AND FIGURES



Figure 1: View of airplane shortly after landing showing the thermal damage (Photo Courtesy of FAA).



Figure 2: View of the smoke emitted from the engine compartment shortly after the landing.



Figure 3: View of the thermally damaged engine compartment and cowling area (Photo Courtesy of FAA).



Figure 4: View the left magneto displaced from its attachment area.



Figure 5: View of the top of the engine.



Figure 6: View of the substantially damaged rudder.

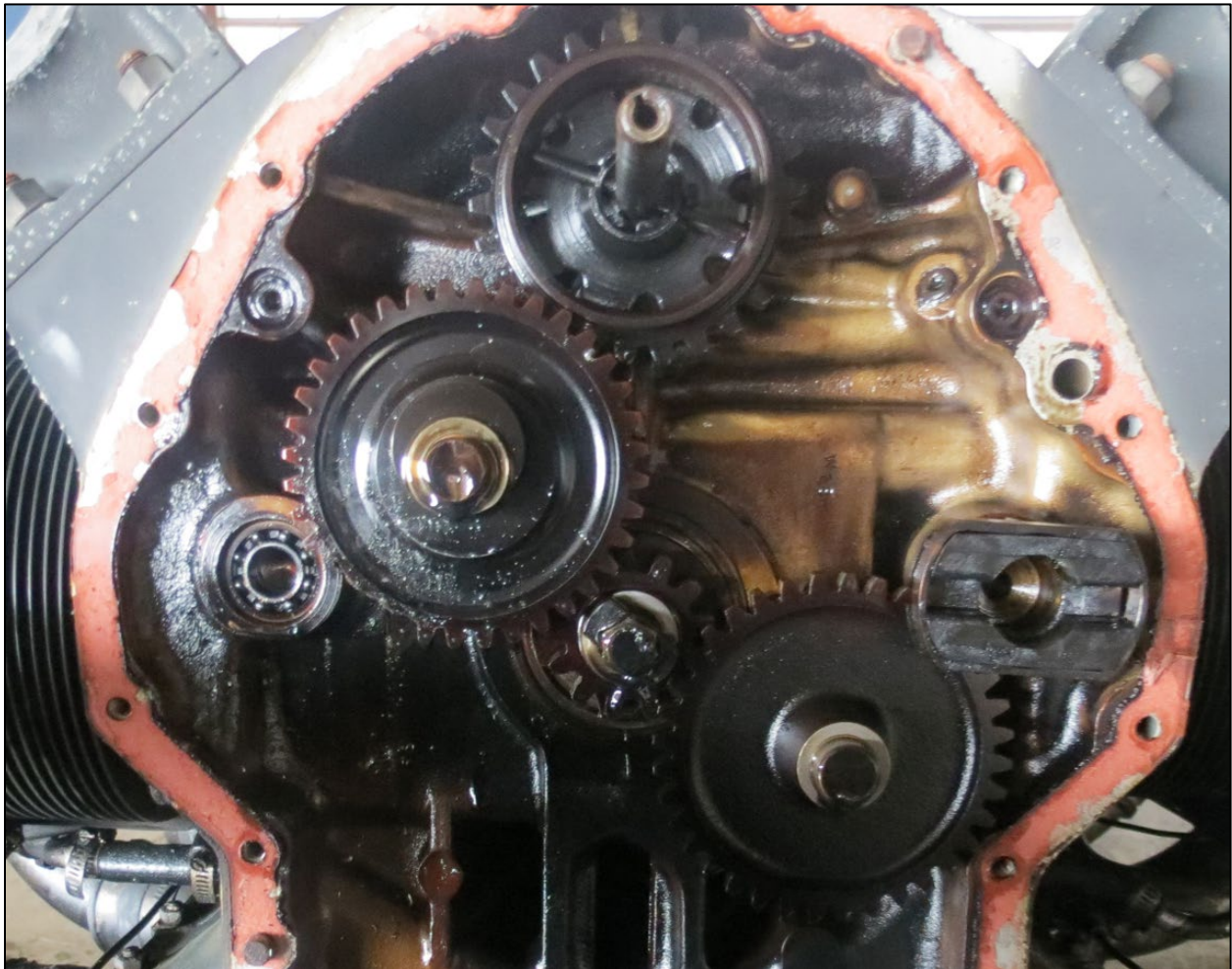


Figure 7: View of the exposed accessory section and engine gear area of the engine.

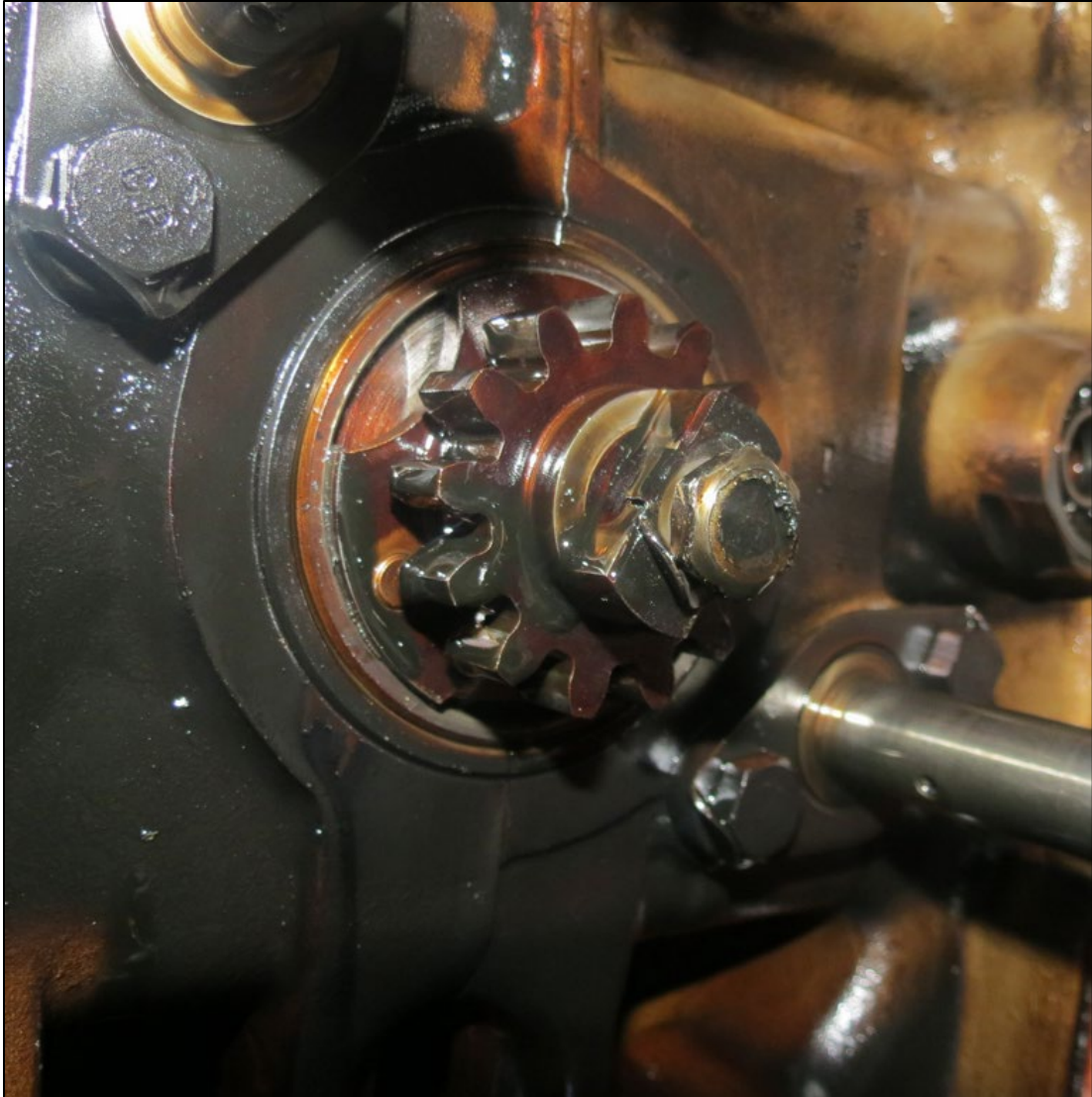


Figure 8: Crankshaft drive gear and bolt.



Figure 9: Crankshaft drive gear bolt removed. Note the dowel pin had sheared.



Figure 10: View of the dowel pin and crankshaft drive gear attachment area.



Figure 11: Thermal damage noted to the propeller oriented upward.

Submitted by:

Adam Gerhardt
Senior Air Safety Investigator