

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



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AIRFRAME AND ENGINE EXAMINATION

June 11, 2024

TABLE OF CONTENTS

A. ACCIDENT	3
B. AIRFRAME AND ENGINE EXAMINATION.....	3
C. SUMMARY	3
D. DETAILS OF THE EXAMINATION.....	4
1.0 AIRFRAME EXAMINATION.....	4
2.0 ENGINE EXAMINATION	4
3.0 METEOROLOGICAL INFORMATION	6

A. ACCIDENT

Location: Prescott, Arizona
Date: September 02, 2023
Time: 0802 Pacific standard time
1502 UTC
Airplane: Piper PA-28-140 Cherokee

B. AIRFRAME AND ENGINE EXAMINATION

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NTSB Investigator	Joshua Cawthra National Transportation Safety board Federal Way, Washington
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C. SUMMARY

On September 02, 2023, about 0806 mountain standard time, a Piper PA-28-140 Cherokee, N6834W, was substantially damaged when it was involved in an accident near Prescott, Arizona. There were no injuries. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The pilot reported that they departed with full power and the airplane utilized the entire available runway for the takeoff roll. About 100 ft above ground level, the pilot observed the airplane's climb rate decreasing. This was accompanied by a drop in engine rpm and an abnormal noise and vibration from the airplane. The pilot pushed the nose down to maintain airspeed as he prepared for an emergency landing along a road off the end of the runway. During the landing the left wingtip contacted a tree resulting in a partial spin of the airplane and substantial damage to the wings and empennage.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

Make: Piper

Model: PA-28-140

Serial Number: 28-20975

Examination of the recovered airframe revealed that the recovery organization had removed the wings and cut off the damaged tail section.

Flight control continuity was established from the cockpit flight controls to the respective flight control surfaces. All areas of separation within the flight control cables were consistent with overload or separation by recovery personnel to facilitate recovery.

A visual inspection was conducted of the fuel system. The fuel selector lever was observed in the off position. The fuel lines within the cabin, coming from the left and right wing, were tested with low air pressure and continuity was confirmed through the fuel selector valve and through the electric boost pump. The fuel selector valve appeared undamaged and rotated normally, and each detent was noticeable. The fuel supply line from the fuel selector to the fire wall was fracture separated, consistent with wing removal during recovery. About 3 ounces of blue liquid, consistent with 100LL avgas in both odor and color, was drained from the carburetor bowl. This sample was tested with water-finding paste with negative results.

The throttle and mixture control cable continuity was established from the cockpit controls to the carburetor and all levers moved from stop to stop when actuated by hand.

2.0 Engine Examination

Engine Manufacturer: Lycoming

Engine Model Number: O-360-E2A

Engine Serial Number: L-15193-27A

Examination of the recovered engine revealed that it remained attached to the engine mounts. All four cylinders and all engine accessories remained attached. All fuel and oil lines appeared attached to their respective fittings and were tight. No evidence of any mechanical damage was observed to the engine crankcase.

The rocker box covers were removed. The intake and exhaust rocker arms were intact, and oil coated on all cylinders. All intake and exhaust valve springs were in place and visually appeared to be undamaged. The upper spark plugs were removed, and all four cylinders were examined internally using a lighted borescope. A normal amount of combustion deposits was observed within the combustion dome of each cylinder and piston face. All the intake and exhaust valves were unremarkable. The crankshaft was rotated by hand using the propeller hub. Rotational continuity was established throughout the engine and valve train. Thumb compression and suction were obtained on all four cylinders.

The top engine spark plugs were removed from the engine, and they were the massive electrode type. All the spark plugs exhibited black and gray deposits within the electrode area. The spark plugs exhibited signatures consistent with WORN NORMAL when compared to the Champion Check-A-Plug comparison chart.



Figure 1- Removed engine top spark plugs

The left and right magnetos remained attached to the engine accessory case with no external damage noted. The ignition harness remained attached to each magneto. The right magneto to engine timing was observed at 24° BTDC of the cylinder #1. The left magneto to engine timing was observed at 24° BTDC of the cylinder #1. Electrical continuity was established to the cockpit mounted ignition switch. The switch operated normally at each of the detents during hand actuation of the switch.

The exhaust system remained secure to the cylinders. No evidence of any exhaust leaks around the cylinder attach points were observed. The exhaust system was examined internally using a lighted borescope, no debris or obstruction was observed. Crushing was observed near the exhaust outlet port.

A remote fuel source was attached to the inlet fitting of the electric fuel boost pump and electrically energized. A fuel pressure indication within the normal operating range was observed at the cockpit mounted fuel pressure gauge.

The airplane was strapped down to stationary I-bolts. The engine started during the first attempt to start. The engine throttle was advanced to about 1700 RPM. The engine ran throughout various power settings uneventfully for about 5 minutes. A functional check was conducted of the magnetos. A change of about 75 RPM was noted during the left and right magneto checks. The throttle was advanced to the full forward position and a static RPM of about 2700 RPM was observed. The engine ran smoothly during the operational check and exhibited no unusual indications.



Figure 2- Floor mount for engine run

3.0 Meteorological Information

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Submitted by:

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