

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA002

AIRFRAME & ENGINE EXAM

February 15, 2023

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A. ACCIDENT

Location: Clovis, New Mexico
Date: October 2, 2022
Time: 1600 mountain daylight time
Airplane: Piper PA-46-350P, N987PS

B. AIRFRAME & ENGINE EXAM

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C. SUMMARY

On October 2, 2022, about 1600 mountain daylight time, a Piper PA-46-350P, N987PS, was substantially damaged when it was involved in an accident near Clovis, New Mexico. The pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations Part 91* personal flight.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

Examination of the recovered airframe revealed that the recovery organization had cut both wings chordwise about 18" outboard of the fuselage, and removed both horizontal stabilizers and elevators for transport. The forward section of the fuselage, near the cockpit was impact and thermal damaged. The observed hobbs meter time was 2936.8 hours.



Figure 1: View of airplane during examination.

The elevator and rudder flight control cables were continuous from the cockpit controls to the flight control surfaces. The aileron cables and balance cable were disconnected by recovery personnel at the turnbuckles located in the center of the cabin.

The left and right wings exhibited impact damage. The airplane was equipped with integral wing fuel tanks. Visual inspection of the right and left fuel caps revealed that the rubber seal appeared normal and unremarkable. Both fuel filler ports were normal and unremarkable. No fuel was observed in either wing tank. The aircraft's battery was electrically connected to each of the fuel boost pumps and they were heard to operate. All 6 fuel tank finger screens were observed to be free from blockage.

The flap jack screw had about 1 thread exposed which is consistent with the flaps being in the retracted position. The elevator trim jackscrew was extended with about 5 threads visible on the forward side of the drum which is consistent with a partial aircraft nose down trim setting.

The throttle and mixture control continuity were established from the cockpit controls to the fuel servo and all levers moved from stop to stop when actuated by hand. The propeller control continuity was established from the cockpit control lever to the propeller governor and moved from stop to stop when actuated by hand.

A visual inspection was conducted of the fuel system. Continuity was visually established from the main fuel tanks throughout the system to the fuel divider. The fuel line from the fuel divider was disconnected, and fuel selector lever was moved from the off position to the left tank. Air pressure was applied to the fuel line coming from the left boost pump and air could be heard at the fuel divider. The fuel selector was then moved to the right tank. Air pressure was applied to the fuel line coming from the right boost pump and air could be heard fuel divider. Visual inspection of the airframe fuel strainer assembly found no debris.

2.0 Engine Examination

Engine Manufacturer: Lycoming
Engine Model Number: TIO-540-AE2E
Engine Serial Number: L-10256-61A

Examination of the recovered engine revealed that the two upper engine mounts had fracture separated. All six cylinders remained attached with no damage noted. All fuel and oil lines that were removed were tight. No evidence of any mechanical damage was observed to the engine crankcase.



Figure 2: View of airplane engine during examination.

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 six 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. The no. 6 cylinder piston face exhibited an irregular deposit pattern. All of 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 was obtained on all six cylinders.

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

A visual inspection was conducted of the induction system. The induction system remained attached to the cowling, turbos, and servo. The air induction filter element and housing were impact damaged and contained dirt and grass consistent with impacting the field.

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 from the turbo to exhaust outlet. The left turbo rotated freely when rotated by hand. Debris was observed in the right turbo consistent with impact. Air was applied to clear the debris and the right turbo rotated. Crushing was observed near the exhaust outlet port on both sides.

The left and right magnetos remained attached to the engine accessory case with no external damage noted. Both magnetos were removed from the engine. Using a hand tool, the magnetos were rotated, and spark was produced on all six ignition leads of each magneto.

The engine oil sump suction screen was removed and was free of debris.

The fuel flow divider was intact, undamaged, and disassembled. The spring and diaphragm were intact and undamaged. All fuel lines were removed from the fuel injector, low pressure air was applied to the to the fuel divider, and air was felt at the fuel line tips.

3.0 Propeller Examination

The airplane was equipped with a 3 blade, constant speed propeller. The propeller blades separated near the propeller hub. For the purposes of this examination, the propeller blades where labeled A, B, and C.

Propeller blade A exhibited a crack from the leading edge to the trailing edge, near the tip with polishing of the blade face along with chordwise striations on the cambered side of the blade. Propeller blade B exhibited polishing of the blade face along with unidirectional striations on the cambered side of the blade. Propeller blade C exhibited a separation near the propeller tip with polishing of the blade face along with chordwise striations on the cambered side of the blade.



Figure 3: View of propeller blades during examination.

4.0 Aircraft Information

A review of the airplane logbooks revealed that, the most recent annual inspection was conducted on August 17, 2022. At the time of the exam the aircraft total time was 2909.1 hours.

5.0 Meteorological Information

The automated weather observation station located at the Clovis Regional Airport Clovis, New Mexico reported that, about the time of the accident, the wind was from 180° at 11 knots, visibility 10 statute miles, sky broken 8000 ft, temperature 27°C, dew point 6°C, and an altimeter setting of 30.22 inches of mercury. The pilot was landing the airplane on runway 04.

Submitted by:

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