

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24FA105

ENGINE EXAMINATION

November 15, 2024

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A. ACCIDENT

Location: Madras, Oregon
Date: March 10, 2024
Time: 1503 Pacific standard time
2303 UTC
Airplane: Piper PA-32-360 (N3264W)

B. ENGINE EXAMINATION

PARTICIPANTS

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C. SUMMARY

On March 10, 2024, at 1503 Pacific daylight time, a Piper PA-32-260, N3264W, was destroyed when it was involved in an accident near Madras, Oregon. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

D. DETAILS OF THE INVESTIGATION

1.0 Details of the Engine Exam

Examination of the recovered engine revealed that the engine was separated from the engine mount and crushed consistent with impact damage on the right side. The damage to the engine precluded engine rotation.

Both engine accessory case magnetos were separated from their mounting pads. The oil cooler was attached to the oil supply and return hoses and attached to the oil regulator on the accessory case. The oil filter was separated and crushed. The mechanical fuel pump was separated from its mounting pad. The fuel pump actuating lever was visible in the center of the mounting pad. The vacuum pump was separated from the accessory case.



Figure 1: View of right side of engine.

The camshaft remained intact, and each of the cam lobes exhibited characteristics consistent with an elliptical shape. The top and one of the bottom spark plugs were removed, and the electrodes remained undamaged and exhibited normal depositing, reference the Champion spark plug chart - AV-27.

The cylinder combustion chambers were examined with a lighted borescope. All exhibited normal operational carbon deposits. Cylinders 2, 4, and 6 remained attached to the left half of the crank case with no evidence of foreign object damage observed. The right side of the engine case was mostly crushed, and the cylinders remained attached to the crankshaft via their respective connecting rods. Cylinders 1, 3, and 5 were crushed into the crankcase. Most of the right side of the crankcase was crushed and/or missing. The rocker boxes on the left side of the engine looked normal and intact. The right-side rocker boxes were heavily crushed due to impact damage. Cylinder intake and exhaust valves on the right-side rocker boxes of the engine were loosely surrounded by their crushed cylinder head. The pushrods and tubes were either bent or missing and the camshaft sustained minimal impact damage.



Figure 2: Removed spark plugs.

Cylinder boring cross hatching was observed on all cylinder walls. Pistons, connecting rods, and rod end caps were all attached and exhibited minimal wear. All connecting rods were connected to the crankshaft.

The ignition harnesses sustained varying degrees of impact damage and were separated from both magnetos. The carburetor was found separated from the air intake tube box, bent and crushed from impact. The intake tube box manifold was separated from the engine. The air intake tube box assembly sustained damage consistent with impact. The exhaust manifold exhibited crushing on the left side of the engine and was torn from the right side of the engine and missing. The propeller governor was attached to its mounting pad.

2.0 Propeller

The Hartzell HC-C3YR-1RF three bladed propeller. Blade 1 was fully intact measuring 36" long with bending and chordwise striations consistent with the engine developing power on impact. Blade 2 was fractured at 18" exhibiting similar bending and chordwise striations. Blade 3 broke off at the propeller hub.



Figure 3: View of left side of engine.

3.0 Maintenance History

Engine Model: Lycoming engines	O-540 -E4B5		
Engine Serial#	L-9204-40		
Engine TT:	4731.33		
Engine TSMOH:	645.13	hours	1/16/2024

A review of the engine and airframe logbooks revealed that the airplane had received its most recent engine overhaul on September 26, 1996. The engine logbook displayed entries for an annual inspection January 16, 2024, with a Tachometer reading of 4731.33 and a TSMOH of 645.13. The pilot's logbook shows an additional 12.4 hours from the date of the annual signoff. The accident Tachometer hours were not readable off the Tachometer gauge due to impact damage.

Submitted by:

Scott Johnson
Air Safety Investigator