

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24LA084

WRECKAGE EXAMINATION SUMMARY REPORT

Factual Report

March 6, 2024

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A. ACCIDENT

Location: Goodyear, Arizona
Date: 2/10/2024
Time: 0745 local
Airplane: Cessna 172P

B. PARTICIPANTS

IIC Andrew Swick
NTSB AS-WPR
Phoenix, Arizona

FAA-IIC Scott Boek
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Scottsdale, Arizona

Party Member Jennifer Barclay
Textron Aviation, Air Safety Investigations
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Party Member Mark Platt
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C. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

The wings and side struts were removed from the fuselage during the recovery process. The nose landing gear and left main gear separated from the fuselage during the accident sequence. Seventeen gallons of fuel was removed from the left main tank during the recovery process.

The fuselage was buckled throughout, and several cabin windows separated. The engine cowling remained intact and was secured to the airplane. The right entry door was damaged and lodged between the right main landing gear and fuselage. The right stabilizer and elevator had impact damage near the outboard tip fairing. Flight control continuity was established from the cabin area to the elevator and rudder. Aileron flight control continuity was established from the wing root area to the cabin controls and from the wing root to the ailerons.

2.0 Engine Examination

The engine remained attached to the engine mounting assembly. The fuel inlet line from the gascolator to the carburetor separated at the carburetor fitting. The exhaust pipe was crushed flat. The crankcase had a crack near the No. 4 cylinder mount at the 12 o'clock position. The No. 4 cylinder ignition leads were removed from the cylinder before the examination. According to the FAA, the upper spark plug lead was removed onsite.



Figure 1-Follow-up examination, main wreckage.



Figure 2-Engine decowled.

The airplane was not equipped with any non-volatile components to record engine parameters.

The cylinder rocker covers were removed, and the cylinder overhead components were dark in color and covered with residual oil. The cylinders were examined with a lighted boroscope. The combustion chambers were undamaged and had a normal amount of combustion deposits. The crankshaft had limited rotation and cylinder overhead components moved normally during the rotation. Pistons Nos. 3 and 4 did not move during the crankshaft rotation. The accessory tach drive and both magnetos rotated during the crankshaft rotation. Magneto to engine timing was found at 25 degrees BTDC #1 cylinder. Both magnetos remained secure on their respective mounting pads.

The oil filter was removed from the engine and disassembled. Metal contamination consistent with bearing material, was noted in the pleats of the filter. The oil suction screen was removed and contained metal contamination. The screen was about half full of metal consistent with bearing material. The oil sump was removed and contained bearing material fragments.

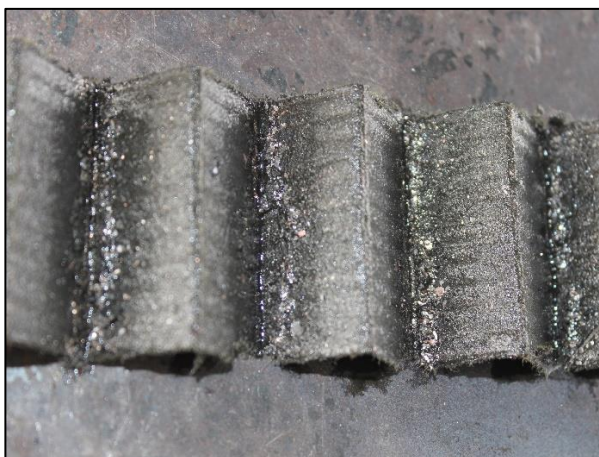


Figure 3-Oil filter pleats and contamination.



Figure 4-Oil suction screen and contaminants.

The No. 4 cylinder was removed and the No. 4 connecting rod separated from the crankshaft and had mechanical damage to the yoke end. The lower yoke portion separated from the connecting rod. The No. 4 connecting rod journal surface showed normal operating signatures. The No. 3 connecting rod separated from the journal and had mechanical damage to the yoke end. Both yoke end portions separated from the connecting rod. The No. 3 connecting rod journal surface showed thermal distress and mechanical damage. The separated connecting rod parts were found in the bay area between cylinders No. 3 and 4. The No. 4 bearing was found with deformation and no thermal distress. Four connecting rod cap bolt ends separated about mid-length and all 4 nuts remained attached.



Figure 5-No. 4 cylinder bay area.



Figure 6-No. 4 cylinder removed.

The No. 2 cylinder was removed, and the connecting rod was loose on the crankshaft. The connecting rod showed thermal distress at the yoke and cap end. The majority of the bearing separated from the connecting rod. The No. 2 connecting rod journal showed thermal distress. The No. 1 cylinder and connecting rod was removed and the connecting rod journal showed normal operating signatures. The connecting rod nuts were found tightly secured on the No.1 and 2 rod caps before removal.



Figure 7-No. 2 cylinder bay area and connecting rod.



Figure 8-No. 1 cylinder bay area and connecting rod.

The oil sump was removed from the crankcase and the sump contained metal contamination and mechanically damaged parts.



Figure 9-Oil sump contaminates.

The No. 3 and 4 connecting rod parts were retained for further examination.



Figure 10-No. 3 connecting rod parts.



Figure 11-No. 4 connecting rod parts.

3.0 Maintenance Records Review

January 26, 2024 (-18.5 hours)

The maintenance records revealed that the last 100-hour inspection was performed, by Angle Aviation, in Peoria, Arizona. At that time the maintenance Hobbs meter read 1,786.9 hours and time since new (TSN) read 3,745.6 hours. The cylinders Nos. 1-4 compression was recorded at 65/80, 68/80, 70/80 and 72/80, respectively.

August 18, 2023 (-598.5 hours)

During a 100-hour inspection that was performed, by Angle Aviation, in Peoria, Arizona, the No. 4 cylinder was replaced with a new cylinder assembly kit p/n 5K21100. Also, a "new assembly drive gasket" and an oil filler tube gasket were installed. Maintenance Hobbs read 1206.9 and TSN read 3,165.6 hours.

At the time of the accident the tachometer read 3,764.1.

Factual report submitted by:

Andrew Swick
Aviation Accident Investigator