

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



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ENGINE EXAMINATION SUMMARY

February 20, 2024

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A. ACCIDENT

Location: Paris, TN
Date: January 21, 2024
Time: 1815 EDT
0015 Zulu
Airplane: N3857Y, Cessna 210

B. ENGINE EXAMINATION SUMMARY

IIC Daniel Boggs
National Transportation Safety Board
Daytona Beach, FL

Investigator Ryan Enders
National Transportation Safety Board

C. SUMMARY

On January 21, 2024, about 1815 central standard time, a Cessna 210D, N3857Y, was substantially damaged when it was involved in accident near Paris, Tennessee. The flight instructor and private pilot were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the pilots, while in cruise flight the airplane started to “shake violently” and the engine subsequently lost all power. The examination took place on February 20, 2024, at AMF Aviation, Springfield, Tennessee. The investigator in charge was not present at the examination. The engine examination revealed a 5- inch diameter hole at the top of the crankcase between the Nos. 3 and 4 cylinders. The connecting rod for cylinder No. 4 was not located, and the connecting rod journal displayed thermal discoloration and metal transfer. The No. 4 connecting rod bolts and cap, multiple bearing remnants, portions of connecting rod bolts, and pieces of the No. 4 piston and piston ring were recovered from the oil screen.

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site

N/A, not observed.

2.0 Airframe Examination

Not examined

3.0 Engine Examination

The engine remained attached to the engine bed mount. A large hole approximately 5 inches in diameter was observed at the top of the crankcase between the numbers 3 and 4 cylinders. The mounting structure was cracked by the forward right-hand engine mount. The oil level gauge remained installed, and 2 quarts was observed. The oil appeared clean. The spark plugs were removed and showed coloration consistent with normal engine operation. Both spark plugs in cylinder number 4 were less than finger tight. The engine rotated 720 degrees when force was applied to the propeller. The fuel nozzles were removed from the cylinders and appeared visually unobstructed. The rocker box covers were removed, and no discrepancies were noted to the valve springs or rocker arms.

Cylinders 5 and 6 were removed to gain better access to cylinders 3 and 4. The combustion chambers and pistons of cylinders 5 and 6 were unremarkable. The connecting rods from cylinders 5 and 6 moved freely on their respective crankshaft journals. Damage to the cylinder skirts of cylinders 3 and 4 prevented their removal. The connecting rod remained installed to the piston pin and crankshaft in cylinder 3. The connecting rod for cylinder 4 was not present. Damage to the bottom of the piston was seen through the large hole in the crankcase. Damage to the number 4 connecting rod journal showed significant thermal discoloration and metal transfer.

The number 4 connecting rod cap was found in the oil sump with a magnet in two pieces. Multiple bearing remnants were removed from the oil sump. Pieces of the number 4 piston and piston ring material were located within the oil sump. Portions of both connecting rod bolts from the number 4 connecting rod were retrieved from the oil sump. The remainder of the connecting rod cap, connecting rod bolts and bearing material were packaged separately and kept with the airplane. Cylinders 1, 2, and 3 were inspected with a lighted borescope and no discrepancies were noted.

The induction pipes to the cylinders were cut to facilitate the cylinder removal. The pushrod tubes from cylinders 6,5,4, and 3 were pried off. The accessories were not removed during this engine examination.

Examination by Ryan Enders.

Submitted by:

Daniel Boggs
Air Safety Investigator