

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23FA038

EXAMINATION SUMMARY

April 14, 2023

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A. ACCIDENT

Location: Decatur, Texas
Date: November 18, 2022
Time: 1510 central standard time
Aircraft: Cessna 421C (s/n 421C1050), N6797L

B. PARTICIPANTS

Investigator-in-Charge (IIC) Timothy Sorensen
Senior Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Party Coordinator Phillip Grice
Manager - Product Field Performance
Continental Aerospace Technologies
Mobile, Alabama

Party Coordinator Kurt Gibson
Air Safety Investigator
Textron Aviation
Wichita, Kansas

C. ACCIDENT SUMMARY

On November 18, 2022, at 1510 central standard time, a Cessna 421C airplane, N6797L, was destroyed when it was involved in an accident near Decatur, Texas. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Engine teardown examinations were conducted on April 11th, 12th, and 13th, at Continental facilities in Mobile, Alabama. Oversight was provided by the NTSB investigator-in-charge. Technical support was provided by Continental Aerospace and Textron Aviation.

D. EXAMINATION SUMMARY

1.0 Engine Examination

1.1 Left Engine

Continental GTSIO-520-N1B (s/n 808268-R)

The engine assembly was discolored consistent with exposure to the post-impact fire but appeared otherwise intact. The intake and exhaust ducting were secure and exhibited minor denting consistent with impact. Both were clear and free of debris. The oil sump was crushed upward consistent with impact. The crankcase was intact, and the cylinders remained securely attached to the crankcase. The nos. 1 and 2 cylinder cooling fins were bent consistent with impact; the remaining cylinders appeared intact.

The valve covers were intact and secure. The crankshaft and camshaft were intact. The crankshaft counterweights were secure with free movement as required. The propeller reduction gears appeared undamaged. Several push rods were bent. The rocker arms, valve springs and valves were intact. The pistons appeared undamaged. The connecting rods were intact and remained secured to the crankshaft. The main journal and propeller bearings were unremarkable. The cylinder bores and cylinder heads were unremarkable.

The engine-drive fuel pump exhibited fire damage. The input drive coupling was intact. The pump would not rotate by hand consistent with the thermal damage. The vanes and spindle were intact. Teardown examination did not reveal any anomalies consistent with a pre-impact failure.

The oil pump assembly was intact and free to rotate. The oil and scavenge pump impellers were intact. No evidence of debris / hard particle passage was observed. The oil filter was secured to the remote adapter fitting, and the filter adapter was intact. The oil filter was opened and examined. The filter media was clean and free of debris.

The fuel system - fuel manifold valve, injection lines, injector nozzles - were secure and appeared undamaged. The wing nacelle fuel valve assembly appeared intact. At the time of the on-scene examination, the valve was in the OFF main fuel tank position. A functional test of the valve using compressed air, conducted at the time of the engine examination, did not reveal any anomalies.

Both magnetos remained secured to the engine. Magneto timing was about 24° BTDC as required. The magneto drive adapter - left and right - were intact. Accessory section continuity to the magnetos was confirmed. The ignition harness was attached to each magneto and spark plug. The spark plugs were intact, and several plug electrodes were worn. The magnetos provided spark at all leads when tested.

The propeller governor was intact. The control arm was free to rotate. The input drive spline was intact and free to rotate by hand. A teardown examination revealed no anomalies. The internal gears and the flyweights appeared intact and undamaged.

The vacuum pump was damaged consistent with the post-impact fire. The pump input drive was undamaged, and the pump rotated by hand with some binding.

The starter adapter was intact and securely attached to the engine. The adapter was free to rotate by hand and internal continuity was confirmed. The vibration damper was intact and secure. Play appeared to be within proper limits.

The throttle and metering unit exhibited post-impact fire damage. The throttle linkage and butterfly valve were in place. The valve was free to rotate. The fuel screen was intact and exhibited minor debris accumulation.

The turbocharger assembly was intact. The compressor and turbine discs appeared undamaged and were free to rotate. Rotation of the compressor resulted in corresponding movement of the turbine.

The examination did not reveal any anomalies consistent with a pre-impact failure or malfunction.

1.2 Right Engine

Continental GTSIO-520-N2B (s/n 277188-R)

The left side of the engine was discolored and damaged consistent with the post-impact fire. The oil sump was crushed upward consistent with impact. The intake and exhaust ducting were secure and appeared unobstructed. The crankcase was not breached, and the cylinders securely attached to the crankcase. The nos. 1 and 2 cylinder cooling fins were bent consistent with impact. The remaining cylinders

appeared intact with exception of the previously noted thermal exposure. The cylinder bores and cylinder heads were unremarkable.

The valve covers were secure. The crankshaft and camshaft were intact. The propeller reduction gears appeared undamaged. The push rods, rocker arms, valve springs and valves were intact. The pistons appeared undamaged. The connecting rods were intact and remained secured to the crankshaft. However, the connecting rods and rod caps were discolored consistent with oil starvation.

The crankcase main journal bearings nos. 1 to 4 were discolored and extruded consistent with overheating and oil starvation. The nos. 1 and 2 crankcase bearings were dislocated with the left side bearing positioned on the right side: one bearing on top of the other. Bearings nos. 5 and 6, and propeller bearings nos. 1 and 2 appeared intact and undamaged. Multiple metallic fragments were distributed throughout the engine. The interior faces of the crankcase displayed abrasion damage consistent with forward-aft movement of the crankshaft. The idler gear pin was dislocated from the installed position. Similarly, the idler gears were out of position and unable to drive the magnetos.

Both magnetos were secured to the engine and appeared intact. The left magneto housing was discolored consistent with the post-impact fire. The housing appeared otherwise intact. The left magneto adapter was fractured, and the magneto drive coupling was damaged. The right magneto drive was unremarkable. The ignition harness remained secured to the magnetos. The left side harness leads exhibited thermal damage. The right-side harness appeared undamaged. The magnetos provided spark at all leads when tested.

The fuel system - fuel manifold valve, injection lines, injector nozzles - were secure and appeared undamaged. The wing nacelle fuel valve assembly appeared intact. At the time of the on-scene examination, the valve was in the RIGHT main fuel tank position. A functional test of the valve using compressed air, conducted at the time of the engine examination, did not reveal any anomalies.

The oil pump housing and impellers were intact. The pump housing and impellers were oil wetted, and a small amount of metallic debris was observed on the impellers. The housing cavity exhibited rotational scoring consistent with metallic debris/hard particle passage. The oil scavenge pump housing and impellers were intact and unremarkable.

The oil filter was secured to the remote adapter fitting, and the filter adapter was intact. The oil filter was opened and examined. The filter media was intact and contained metallic debris throughout the filter.

The propeller governor was intact. The propeller control cable rod end remained attached to the control arm. The control arm was free to rotate. The input drive spline was intact and free to rotate by hand. The governor was not examined further.

The vacuum pump was discolored consistent with the post-impact fire, and the drive adapter was intact. The pump input drive was undamaged, and the pump was free to rotate by hand.

The starter adapter was intact and securely attached to the engine. The adapter was free to rotate by hand and internal continuity was confirmed. The vibration damper was intact and secure; however, the damper flywheel displayed about 9/16-inch rotational play.

The throttle and metering unit exhibited post-impact fire damage. The throttle linkage and butterfly valve were in place. The valve was jammed within the servo consistent with impact forces. The fuel screen was intact and exhibited minor debris accumulation.

The turbocharger assembly was intact. The compressor and turbine discs appeared undamaged and were free to rotate. Rotation of the compressor resulted in corresponding movement of the turbine.

The examination revealed damage consistent with oil starvation throughout the engine.