

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN24FA228

ENGINE TEARDOWN

February 11, 2025

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A. ACCIDENT

Location: Steamboat Springs, CO
Date: June 17, 2024
Time: 1623 Local
2223 UTC
Airplane: Cessna 421, N245T

B. ENGINE TEARDOWN

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C. SUMMARY

The engines were removed from the airplane and crated at Beegles Aircraft Services, Greeley, Colorado. The engines were shipped to Continental's facility in Mobile, Alabama. The engines were examined February 11-14, 2025.

Prior to the accident, the pilot had reported to ATC that he had "lost" the left engine and had diverted to the nearest airport.

D. DETAILS OF THE EXAMINATION

1.0 Left Engine Teardown - s/n 277135

The left engine was removed from its secured shipping container and placed on an engine stand for disassembly and examination. The engine could not be rotated by hand. The engine's intake system was largely destroyed by fire and the remnants melted and settled into the engine cylinders.

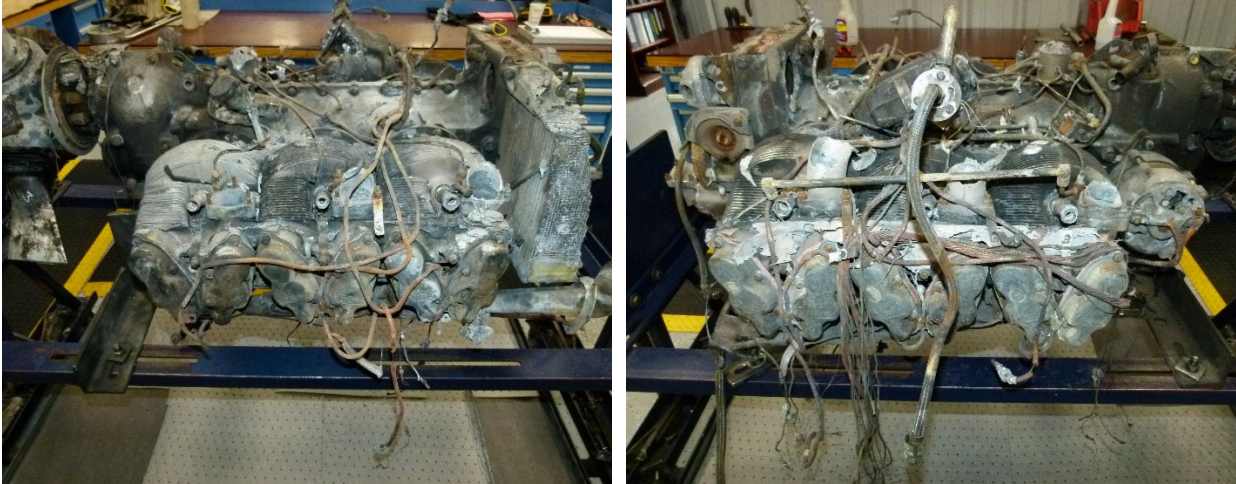


Figure 1 Left Engine on Stand (Continental Photos)

The ignition harnesses were largely fire and impact damaged and could not be functionally tested.

The spark plugs were removed and photo documented. All spark plugs appeared to be serviceable prior to the accident.

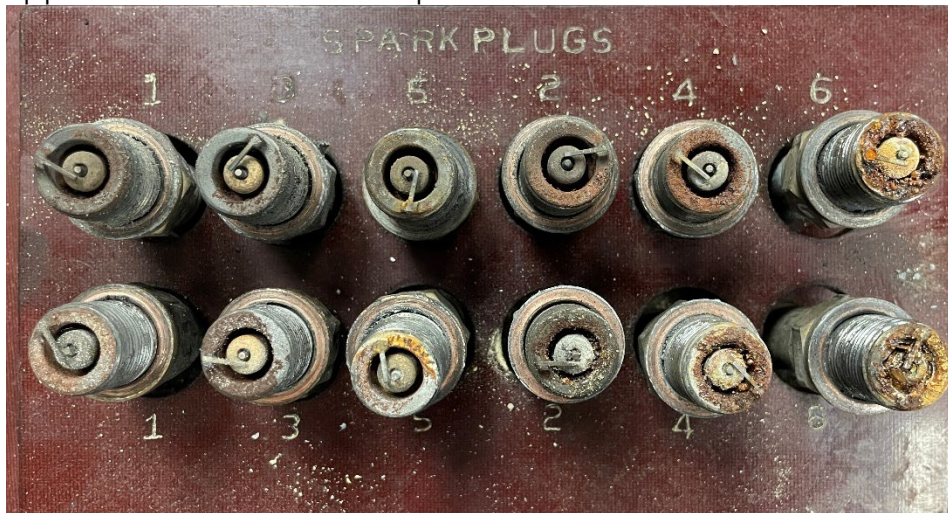


Figure 2 Spark Plugs

The rocker boxes were removed, and the rocker arms were disassembled from the engine along with the push rods. The No. 6 cylinder's intake rocker arm's securing hardware: the left side did not contain the proper hardware, and the right side had the securing fins turned outwards but appeared to be secured (see figure 3).

No other anomalies were detected. None of the rocker arms had signatures of excess wear.



Figure 3 No. 6 Cylinder Rocker Arms

The engine accessories were removed and documented. The engine starter adapter's drive spline teeth were damaged (see figure 4).



Figure 4 Engine Starter Adapter

Further disassembly of the engine found that the accessory drive sprocket from the crankshaft gear had broken and missing teeth. Yellow paint was placed on the alignment mark on the camshaft cluster gear. Rotating the engine, the camshaft and camshaft cluster gears were found to be properly aligned (see figure 5).

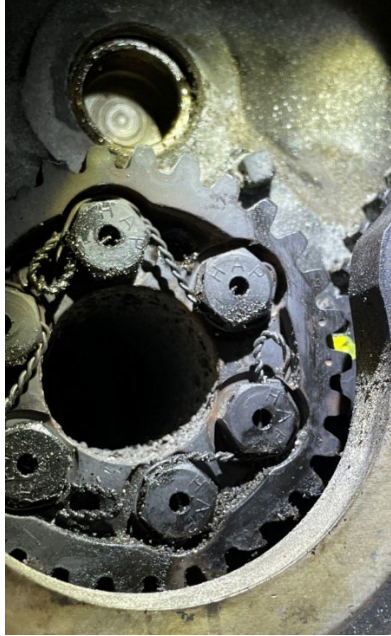


Figure 5 Timing Marks with Paint Added

There are no timing marks on the idler gear. It could not be determined if the idler gear which drove the magnetos may have shifted which would change the magneto timing (see figure 6). In figure 5, the idler gear is the left most gear.

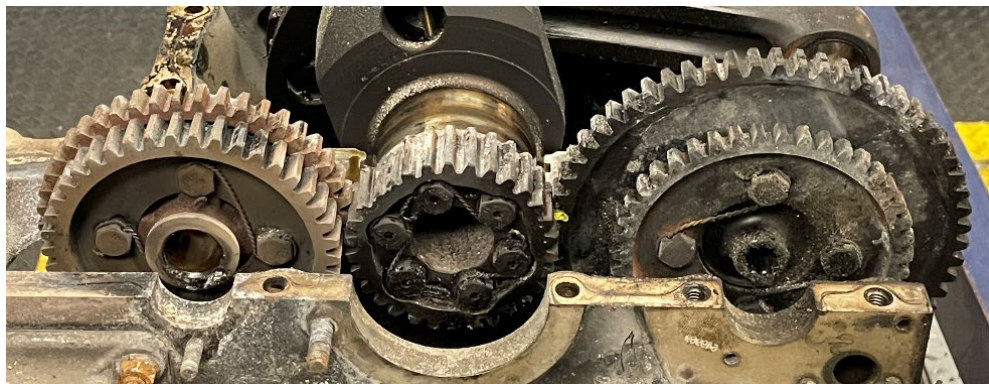


Figure 6 Gears

The left magneto was partially consumed by the postimpact fire and could not be tested (see figure 7).



Figure 7 Left Magneto

The right magneto was destroyed by the postimpact fire and could not be examined.

The fuel system was largely destroyed by postimpact fire and could not be tested.

An examination of the crankshaft gear found that metal composition was appropriate. The mode of fracture on the gear teeth could not be determined due to machine damage.

No other anomalies were detected with the engine. No evidence of internal thermal distress from oil starvation was found.





Figure 8 Left Engine Piston Heads

2.0 Right Engine Teardown - s/n 277136

The right engine was removed from its secured shipping container and placed on an engine stand for disassembly and examination. The engine could not be rotated by hand. A portion of the induction system had been removed during recovery and was not in the shipping container.

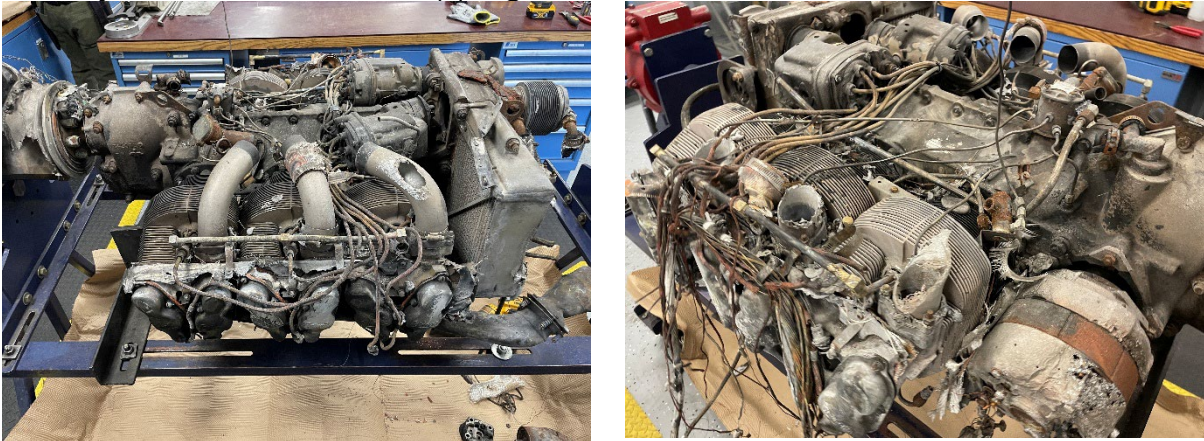


Figure 9 Right Engine on Stand

The ignition harnesses were largely fire and impact damaged and could not be functionally tested.

The spark plugs were removed and photo documented. All spark plugs appeared to be serviceable prior to the accident (see figure 10).

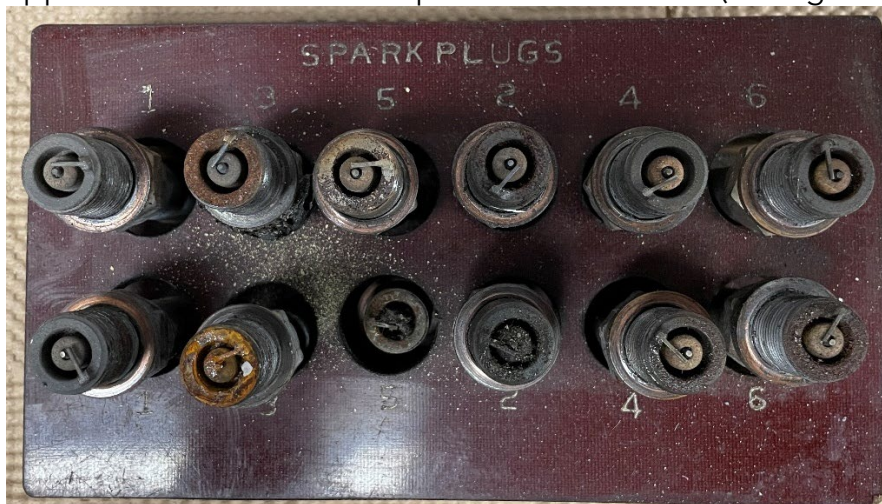


Figure 10 Right Engine Spark Plugs

The rocker boxes were removed, and no anomalies were detected. The rocker arms were removed and photo documented with defects noted.

The engine driven fuel pump could be rotated using a hand tool and displayed signatures of heat and fire damage.





Figure 11 Right Engine Piston Heads

The left and right magnetos were removed and due to fire damage, could not be tested.

Disassembly of the right engine did not find any anomalies which would have resulted in a loss of engine power.

Submitted by:

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