

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24LA314

ENGINE EXAMINATION SUMMARY REPORT

May 28 & 29, 2025

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A. ACCIDENT

Location: West Sacramento, California
Date: September 19, 2024
Time: 0819 Pacific daylight time
Airplane: Cessna U206G, N6522Z

B. ENGINE EXAMINATION SUMMARY REPORT

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C. SUMMARY

An examination and tear down of the engine was conducted at the facilities of Continental Aerospace Technologies on May 28 and 29, 2025. The examination revealed the number 4 cylinder fuel injection assembly tube was fracture separated at the solder, near the manifold attach point.

D. DETAILS OF THE INVESTIGATION

1.0 Engine Examination

Engine Manufacturer: Continental Motors
Engine Model Number: IO-550-F21B
Engine Serial Number: 1042820
Most Recent Annual Inspection: 11/25/23

INITIAL EXAMINATION AS RECEIVED

The engine was received crated and sealed. (see figures 1 and 2.) After removal from the crate, the engine was examined. The exhaust remained attached to the engine. The exhaust was removed and visually examined; no blockages were noted.

The engine was mounted to a portable cart utilizing mount legs for further examination and teardown.



Figure 1. View of engine crate at examination site.



Figure 2. Engine prior to removal from crate.

DETAILED EXAMINATION

Examination of the recovered engine revealed that all six cylinders and all engine accessories remained attached. No evidence of any external mechanical damage was observed to the engine crankcase. (see figure 3.)



Figure 3. View of engine during examination.

The air induction remained attached to the engine. The air induction system was removed and visually examined, no blockages were noted; one cut mark was noted, consistent with recovery personnel's recovery efforts.

The alternator remained attached to the engine, no apparent damage was noted; it was removed and rotated freely. (see figure 4.)

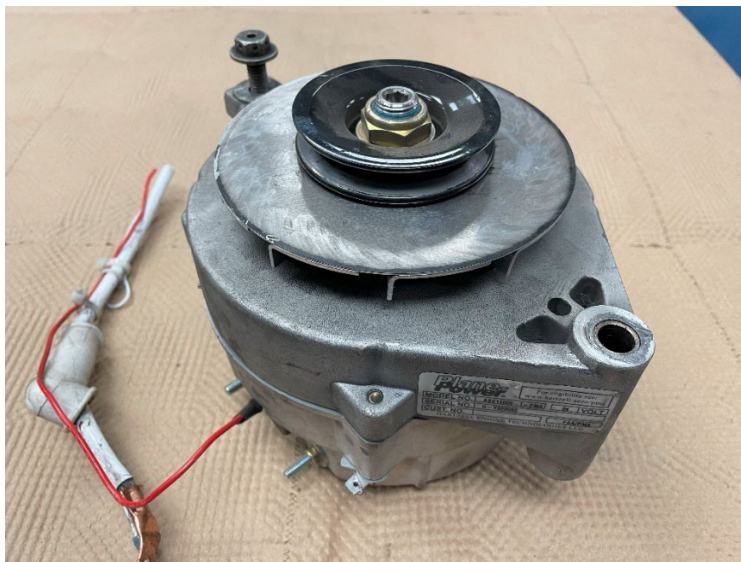


Figure 4. View of alternator.

The starter remained attached to the engine; it was removed and no damage was noted. The engine driven fuel pump remained attached to the engine and no external damage was observed. The fuel pump was removed, and the drive coupling was observed intact and rotated freely by hand.

The upper spark plugs were removed from the engine, and they were the massive electrode type. The sparkplugs exhibited black and gray deposits within the electrode area. All of spark plugs exhibited signatures consistent with WORN NORMAL when compared to the Champion Check-A-Plug comparison chart. (see figure 5.)



Figure 5. View of upper spark plugs.

The crank shaft was rotated manually. No binding was observed during crankshaft rotation. Thumb compression was confirmed on all cylinders. Cold cylinder compression was obtained on all cylinders as follows:

- 1: 18/80
- 2: 8/80
- 3: 60/80
- 4: 37/80
- 5: 50/80
- 6: 60/80

The throttle body was removed from the engine. (see figures 6 and 7.) The throttle lever was intact, moved freely from stop to stop.

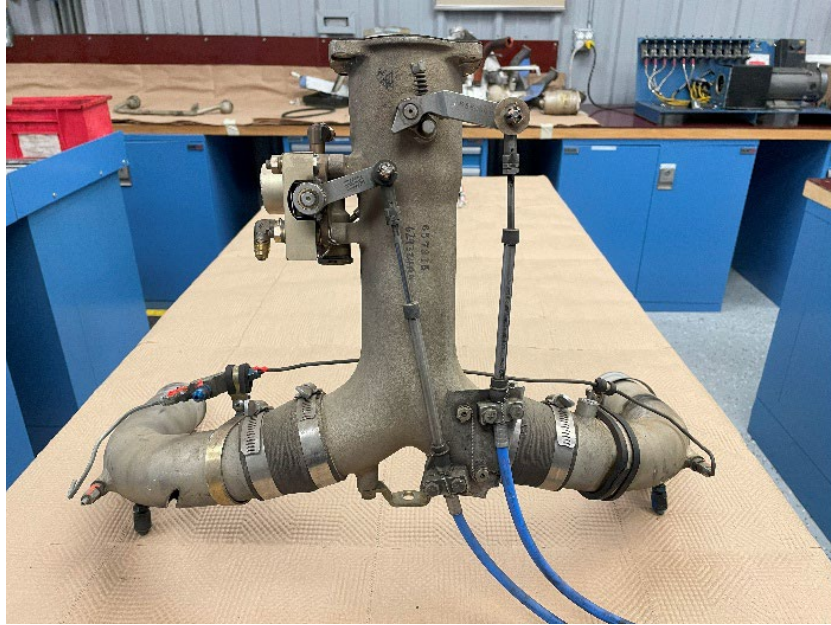


Figure 6. View of throttle body.



Figure 7. View of throttle body.

The magnetos remained attached to the engine. Left magneto timing was 25° , right magneto timing was 24° . The magnetos were removed and mounted to a test stand; spark was produced from both. (see figure 8.)

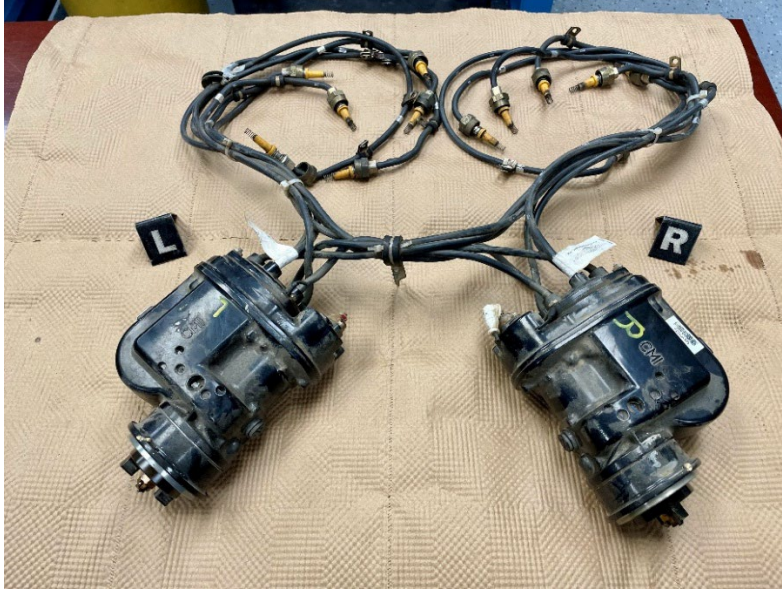


Figure 8. View of left and right magnetos.

The engine oil dipstick was removed and measured 12 quarts of oil. The oil was drained through a screen. No ferrous debris was observed in the oil. (see figure 9.) The oil filter was opened; no debris was observed in the accordion filter screen.



Figure 9. View of screen oil was drained through.

The fuel manifold remained attached and secure to the engine. The no. 4 injector assembly tube exhibited a fracture separation at the manifold fitting; all remaining injector assembly tubes remained secure. (see figure 10.) All fuel injectors were unobstructed. The fuel manifold was removed and disassembled; no anomalies were noted and the screen was clear. (see figure 11.)



Figure 10. View of the no. 4 injector assembly tube.



Figure 11. View of disassembled fuel manifold.

The propeller governor remained attached to the engine, no visible damage was observed. The oil sump remained attached to the engine, no visible damage was observed. The oil sump was removed, and no ferrous debris was observed within. (see figure 12.)



Figure 12. View of the oil sump.

The lower spark plugs were removed. Plugs 1, 3, 5, 6 were oil soaked; plugs 2 and 4 were lightly oil coated. All were dark in color, consistent with oil coating and otherwise appeared consistent with WORN NORMAL when compared to the Champion Check-A-Plug comparison chart.

The rocker box covers were removed. The intake and exhaust rocker arms were intact and oil coated on all cylinders. All intake and exhaust valve springs were in place and visually appeared to be undamaged. All rocker arms and push rods were removed, with no visible damage noted. (see figure 13.)



Figure 13. View of rocker arms and push rods.

All cylinders remained attached to the engine, no external visible damage was observed. The cylinders and pistons were removed and visually examined. No damage was noted to any of the cylinders or pistons. (see figures 14-16.)



Figure 14. View of cylinders nos. 1 & 2.



Figure 15. View of cylinders nos. 3 & 4.



Figure 16. View of cylinders nos. 5 & 6.

The crankcase was disassembled; the camshaft and crankshaft were removed. No anomalies were noted on the camshaft or crankshaft. (see figures 17-19.)

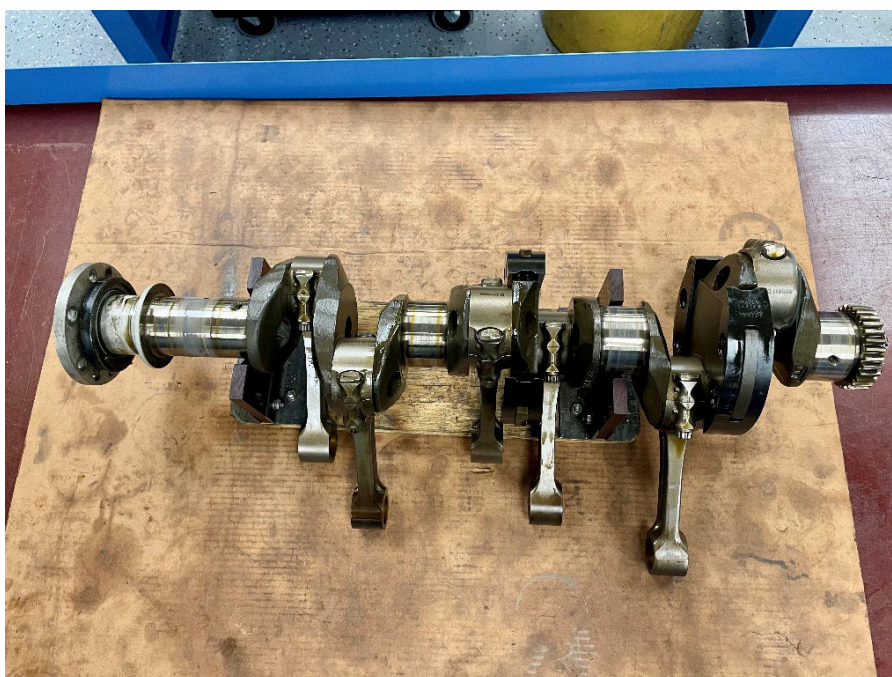


Figure 17. View of the crankshaft.



Figure 18. View of the camshaft.

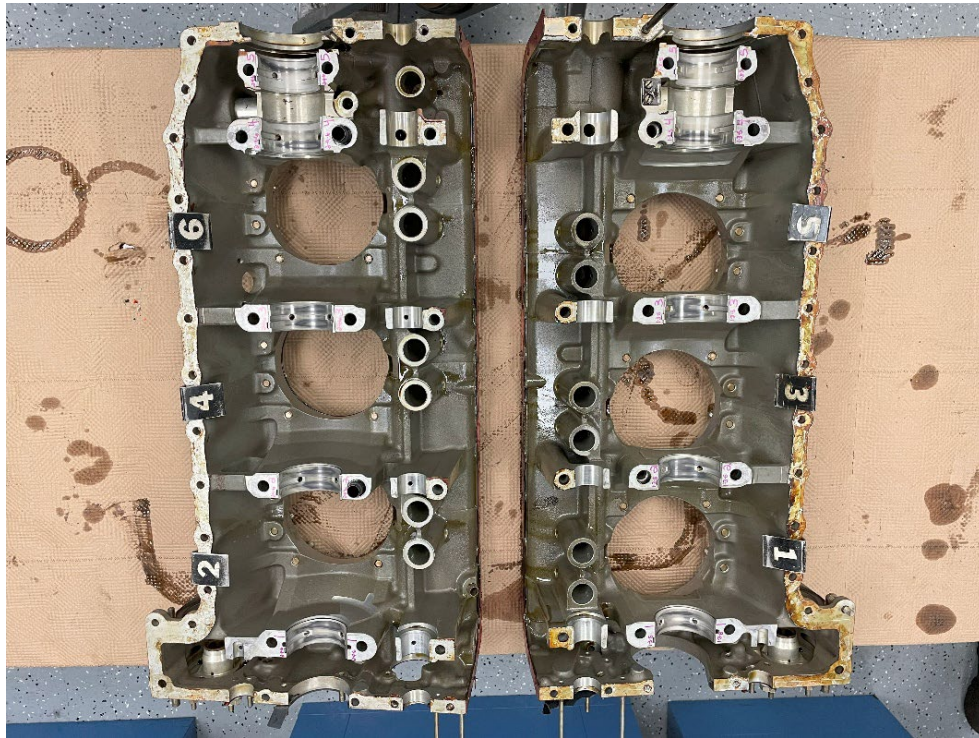


Figure 19. View of the crankcase.

Submitted by:

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