

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR22LA005

ENGINE EXAMINATION SUMMARY REPORT

Factual Report

November 22, 2022

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A. ACCIDENT

Location: Los Banos, California
Date: 10/08/2021
Time: 1904 PDT
0204 UTC
Airplane: N7220B, Beech B36TC

B. 42BENGINE EXAMINATION SUMMARY REPORT PARTICIPANTS

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C. SUMMARY

Examination of the engine was conducted at the facilities of Plain Parts in Pleasant Grove, California. The postaccident examination of the engine revealed that the No. 4 connecting rod bolt on the collar side, was found with the nut missing.

No additional evidence of preimpact failures or malfunctions that would preclude the normal operation of the engine were noted.

D. DETAILS OF THE INVESTIGATION

1.0 Engine Examination

The engine was partially attached from the fuselage and the engine mount assembly remained partially attached to engine because the left and right front mounts were broke. External engine damage was noted by an exit hole near the top of the No. 2 cylinder by about a 2-inch by 3-inch hole. Additionally, cracks were noted in both of the crankcase halves. The left magneto was not attached to the engine and a hole on the left back side was observed that was about 1 inch by 1 inch.

The rocker covers were removed and there was evidence of heat distress on all of the cylinder's, valves. Rotational continuity could not be established due to the crankshaft flange being separated at the crankshaft. All valves were in place and observed to be

appropriate. The top spark plugs were removed, and the electrodes were undamaged and exhibited coloration consistent with normal wear in accordance with Champion Check-A-Plug Chart.



Figure 1: Hole in engine as viewed from the top.

The right magneto was secured on mounting pad. The magnetos rotated freely, and the internal gearing was intact. Spark was produced at all leads.

The oil filter was removed and examined, and substantial metal debris (ferrous and aluminum) was present in the pleats. The oil sump was removed and examined; no anomalies were noted. Examination revealed substantial metal debris and an unusable amount of oil was present. The oil sump was intact, and the gasket appeared undamaged.

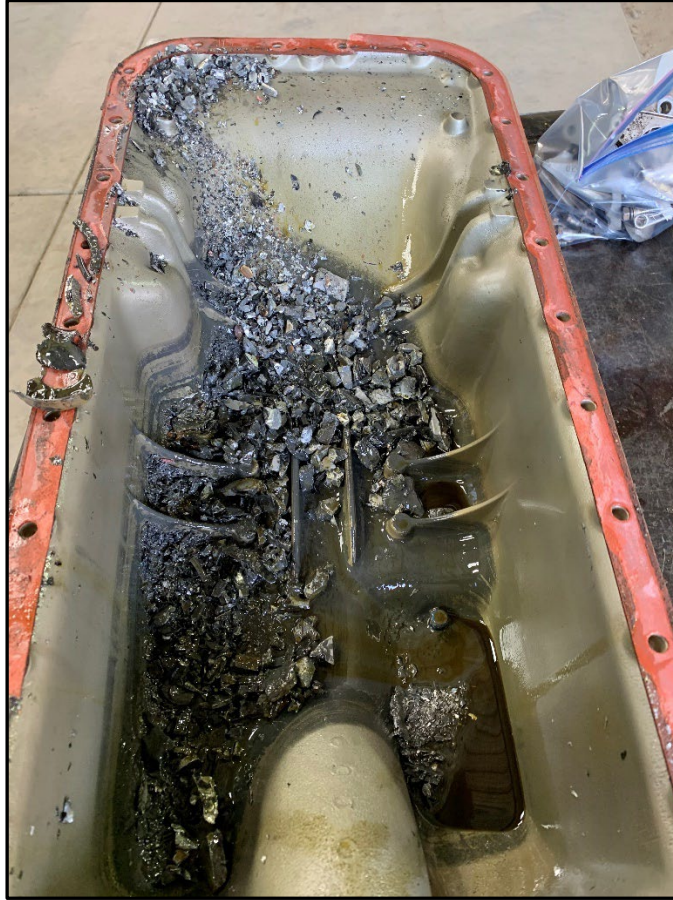


Figure 2: Metal debris in oil sump.

The No. 4 connecting rod bolt on the collar side, was found with the nut missing. The threads appeared undamaged and the thermal damage where it would be located was consistent with the rest of the thermal damage on the connecting rod. The remnants of a connecting rod nut were located in the oil sump. Another connecting rod nut was tightened by hand on the No. 4 connecting rod and revealed that the threads were not damaged. The thermal damage/heat distress in this area appeared to be the most severe sustained by the engine.



Figure 3: No. 4 Connecting Rod Bolt nut missing.

The connecting rod remained attached by the other connecting rod bolt and nut which was found secured. However, because of the missing connecting rod nut on the other connecting rod bolt, the connecting rod was not secured properly. Additionally, the associated bearing No. 4 was thermally damaged and a small portion of it remained melted to the collar.

The other bearings were in place lubricated with the exception of the No. 2 bearing which also displayed thermal damage. However, the No. 4 bearing display the most thermal damage.

The No. 1 connecting rod was bent and the piston was not connected. The piston was located inside the crankcase and was deformed. The No. 2 connecting rod separated. Separation occurred at crankshaft. The No. 3 connecting rod separated at crankshaft and no thermal damage was noted. The No. 4 connecting rod sustained thermal distress to it and crankshaft. A connecting rod nut was missing. The No. 5 connecting rod was attached and sustained some thermal damage on connecting rod collar. The No. 6 connecting rod had sustained some thermal damage on collar. The piston sustained damage to its skirt.

Overall, the camshaft assembly was separated near the aft portion of the engine just forward of the drive gear. Throughout both crankcase halves were substantial metal debris. In the area of the near the No. 1 cylinder location, the lifter bodies were damaged and partially pushed out of the bottom of the engine. All the counterweights all sustained damage.

All the fuel line b-nuts were secured and fuel continuity the engine was confirmed.

All the oil lines were secured.

The propeller was separated from the crankshaft flange. All propeller blades were attached to the hub.

Submitted by Albert Nixon
Senior Aviation Accident Investigator