

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN22LA336

ENGINE EXAMINATION

May 16, 2023

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A. ACCIDENT

Location: Ray, Michigan
Date: July 22, 2022
Time: 1450 Local
1850 UTC
Airplane: Beech A36, N60ED

B. ENGINE EXAMINATION

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C. SUMMARY

D. DETAILS OF THE EXAMINATION

1.0 Engine



Figure 1 Engine (NTSB Photo)

To facilitate transportation, the engine control cables were cut at the firewall. The engine displayed signs of impact and fire damage. The oil and fuel lines remained attached and displayed thermal damage mainly to the rear of the lower left side of the engine. The fuel pump had been removed prior to transportation by the responding FAA inspector.

The rocker box covers were removed, and no damage was noted to the rocker arms. The upper bank of spark plugs removed, and photo documented. All the spark plugs looked to be gapped properly.



Figure 2 Spark Plugs (NTSB Photo)

The engines cylinders were borescoped and no unusual signatures were observed. Due to the angle the engine was stored, oil had collected in the number 5 and 6 cylinders.

Engine continuity was established through the accessory gears by rotating the propeller that remained attached to the propeller flange. Thumb compression was obtained at each cylinder.

The P ignition lead was disconnected from the magnetos. Spark was obtained from the left magneto, but not the right. Damage was noted to the right magneto's leads. The right magneto was removed, and the drive coupling driven with a powered drill which produced spark at all of the leads. The magneto was reinstalled on the engine and the magneto produced spark when the propeller flange was rotated using a hand tool.



Figure 3 Turbocharger (NTSB Photo)

The turbocharger inlet hose was damaged by fire and partially consumed. The inlet hose fastener remained attached to the turbocharger inlet. The turbocharger control was fire damaged, but the metal hardware remained in place. The valve was in the open position. Examination of the turbocharger found that there was no damage to the impeller and compression side blades. The turbocharger displayed signatures of corrosion from storage. Rotation of the fan blades was obtained but with resistance. The waste gate was in the closed position. The turbocharger pressure

relief valve had fire damage to the inlet and exhaust hoses, but the metal hose fasteners remained in place with remnants of the hoses.

The throttle and mixture control arms remained attached to the fuel servo. They both rotated freely from stop to stop. The fuel servo fuel filter was removed and found to be free of debris.

The fuel divider was removed from the engine and opened; the fuel screen was clear of debris.

The fuel filter was removed and cut open. The paper filter did not contain any metal particles.

The GAM injectors were removed and #1 and #5 were fouled with oil, with oil residue found in the upper deck lines only on the right side of the engine.



Figure 4 Fuel Pump (NTSB Photo)

The fuel pump was disassembled and no preimpact anomalies were discovered.

2.0 Propeller



Figure 5 Blade "A" (NTSB Photo)



Figure 6 Blade "B" (NTSB Photo)



Figure 7 Blade "C" (NTSB Photo)

The propeller remained attached to the engine via the propeller flange. The blades were labeled A, B, and C for documentation purposes. Blade A did not display any damage and was unremarkable. The very tip of Blade B had some bending rearward and displayed thermal damage. Blade C displayed some impact and fire damage but was largely unremarkable.

Submitted by:

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