

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN22LA403

EXAMINATION SUMMARY

January 31, 2023

A. ACCIDENT

Location: Houghton Lake, Michigan
Date: August 31, 2022
Time: 1845 Central Daylight Time
Airplane: Beech A36 / N2270L

B. EXAMINATION SUMMARY

Investigator-In-Charge Timothy Sorensen
National Transportation Safety Board
Denver, Colorado

C. SUMMARY

On August 31, 2022, about 1640 eastern daylight time, a Beech A36 airplane, N2270L, was substantially when it was involved in an accident near Houghton Lake, Michigan. The pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

A post-recovery airframe and engine exam was conducted on January 31, 2023, at Myers Aviation, Oshkosh, Wisconsin. The NTSB did not respond to the site at the time of the accident.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site

The airplane came to rest upright in an open marsh area. The airplane was oriented in a shallow nose down and left-wing low attitude. The engine, cowling, and forward fuselage structure had separated and were located near the fuselage.

Recovery personnel reported that approximately 52 gallons of fuel were drained from the airplane. The left-wing fuel tank cap exhibited a sound of air rushing into the tank when the cap seal was opened. Initially, the right-wing fuel tank appeared full. After the airplane was removed from the marsh and leveled, the left- and right-wing fuel tank levels appeared to be at or slightly below the slot in the tab.

2.0 Airframe Examination

Beech A36 (s/n E-922)

The nose section including the "keel" structure and firewall were damaged. The lower fuselage exhibited deformation consistent with impact. The outboard 4-foot section of the left wing was bent downward approximately 40°. The left aileron and flap remained attached and were both damaged. The outboard 2-foot portion of

the right wing was deformed. The right wing also exhibited wrinkling of the skin near mid-span. The aileron and flap remained attached.

Fuel system continuity was confirmed using compressed air from the left and right fuel inlet fittings on the fuselage from the wing roots to the engine fuel line at the firewall. The cockpit fuel selector was in the OFF position at the time of the exam. It was free to rotate with position detents at each position. With air provided at the left-wing fuel inlet and the fuel selector positioned to the RIGHT tank, no air was obtained at the firewall fuel line.

The left-wing fuel system continuity was established using compressed air supplied at the wing root flush vent. Positive air flow was observed into the fuel tank with the fuel cap removed, and with the fuel cap in place through the fuel outlet at the wing root. The fuel tank vent and fuel return lines appeared to be intact, and the connections to the bladder appeared secure. However, the wing root protruding vent from was clogged between the vent and the junction with the flush vent. The debris appeared to consist of dirt consistent with the impact at the accident site.

Borescope examination of the left-wing fuel bladder revealed no anomalies related to the integrity of the bladder itself. However, a small piece of paper towel or rag material protruded from the fuel return orifice into the bladder. Although this may have reduced flow, the return line into the bladder was not completely blocked as noted previously. In addition, the fuel vent orifice opening appeared to be partially obstructed. The material obstructing the orifice appeared identical to the surrounding bladder material. The inboard bladder access zipper was closed (zipped) and the check ("flapper") valve appeared intact.

The right-wing fuel system continuity was established using compressed air supplied at the wing root protruding vent. Positive air flow was observed into the fuel tank with the fuel cap removed, and with the fuel cap in place through the fuel outlet at the wing root. The fuel tank vent and fuel return lines appeared to be intact, and the connections to the bladder appeared secure. The inboard bladder access zipper was open (unzipped) and the check ("flapper") valve appeared intact.

Borescope examination of the right-wing fuel bladder revealed no anomalies related to the integrity of the bladder itself. The fuel vent and return lines were visible at the bladder orifice indicating that the lines were more fully seated as compared to the left bladder as noted previously.

3.0 Engine Examination

Continental IO-520-BB (s/n 809678-R)

The engine remained secured to the airframe at the engine mounts. The engine appeared intact and undamaged. Internal engine and accessory section continuity were confirmed via rotation of the crankshaft. Compression and suction

were obtained on all cylinders. The valve rocker arms and springs were undamaged and displayed normal movement. Borescope examination revealed no anomalies related to the pistons, cylinders, or intake/exhaust valves. The spark plugs appeared intact and displayed normal combustion signatures.¹ Both magnetos were secure and undamaged. The ignition harness was intact. Spark was observed through the ignition harness at all leads.

The engine driven fuel pump appeared undamaged. The drive coupling was intact, and the pump rotated freely by hand. The pump appeared to provide normal fuel flow when operated with a hand drill. The fuel lines to the pump were secure and contained no fuel when disconnected. The fuel injector lines were secure. The individual injectors were not removed.

The fuel servo remained secure. Throttle and mixture controls remained attached to the corresponding control arms at the servo. The engine control cables were separated near the firewall consistent with separation of the engine from the firewall during the accident sequence. The throttle and mixture control arms were free to rotate. The servo venturi was clean and free of debris. The butterfly valve appeared intact and rotated fully with corresponding movement of the throttle arm. The engine air intake and filter were crushed aft consistent with impact. Otherwise, no anomalies were noted.

The fuel distributor valve was intact. A small amount of fluid consistent with aviation fuel was present in the housing. The diaphragm, spring, and screen were intact. No sediment or debris was observed. The fuel flow transducer and corresponding fuel lines were securely installed. No fuel was present in the lines. The transducer was undamaged and appeared unobstructed when low pressure air was passed through it.

The oil filter was secure and was not removed. The oil pump housing and sump appeared undamaged and were not disassembled.

The intake and exhaust ducting appeared undamaged and securely attached at each cylinder. However, the exhaust aft of the mufflers was deformed. The mufflers appeared intact and internal muffler baffles appeared secure.

4.0 Propeller Examination

The propeller assembly was securely attached to the engine crankshaft propeller flange. All three propeller blades were retained by the hub. One blade was bent aft about 45° over the length of the span. The blade was also rotated within

¹ The upper spark plugs were removed and examined directly. The lower spark plugs remained installed and were examined at the time of the borescope examination.

the hub to near feather position. The second blade was bent aft about 30° over the outboard one-half of the span. The third blade appeared undamaged. Both the second and third blades appeared to be near low pitch. The blades exhibited typical leading abrasion consistent with normal operation.

Submitted by:
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