



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

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AIRFRAME AND ENGINE EXAMINATION

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This document contains 9 embedded photos.

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2.0 SUMMARY

Examination of N9745Y was conducted on November 7, 2018 at Anglin Aircraft Recovery, Clayton, DE. Examination of the airframe revealed no anomalies. Examination of the engine revealed catastrophic damage to the No. 3 piston and cylinder, which were retained for further examination.

3.0 DETAILS OF THE INVESTIGATION

3.1 Airframe Examination

The airplane remained largely intact following the accident; however, both wings and the left and right horizontal stabilizers/elevators were removed for transport. All portions of the airplane were accounted for during the examination. The right wing exhibited upward buckling impact damage. The empennage was intact and the baggage door was operational. The landing gear and wing flaps were in the retracted position. The elevator trim was consistent with a nose-up position. The cabin door was operational.

Control cable continuity was established from all flight control surfaces to the cockpit controls through disconnections at the cable turnbuckles, which were made to facilitate recovery. Both left and right wing fuel tanks remained intact and were devoid of fuel (recovery personnel drained a large but unquantified amount of fuel at the accident site; estimated around 60 gallons). Continuity of the fuel lines from the wing tanks to the cockpit fuel selector was established. The fuel selector was positioned on the right tank and contained a small amount of fuel. Fuel line continuity was established from the selector to the firewall.

The airplane was not equipped with shoulder harnesses. The lap seatbelts remained attached to the seats and were unlatched. The seats were intact. The engine firewall exhibited buckling, resulting in reduced space in the area of the rudder pedals.

3.2 Airframe Exam Photos



Figure 1: Airplane as viewed from aft right side



Figure 2: Left wing (Courtesy Textron Aviation)



Figure 3: Right wing (Courtesy Textron Aviation)

3.3 Engine Examination

The engine was equipped with a 2-bladed constant speed propeller, which remained attached. The pitch change links were fractured during the accident. Both blades exhibited s-bending; one blade was missing a portion of its tip.

The engine did not exhibit any external anomalies but was fire damaged at its aft end. The fuel line from the firewall to the fuel pump inlet was fracture-separated at the inlet fitting. The pump and the fractured fitting were retained for further examination.

The fuel line from the fuel pump to the fuel metering unit was intact, and the fuel line from the metering unit to the manifold valve was separated at the metering unit. All B-nuts remained attached at their fittings.

Continuity of the crankshaft and camshaft were confirmed when the propeller was rotated by hand, and thumb compression was obtained on cylinder Nos. 1, 2, 4, 5, and 6. Borescope examination of these cylinders revealed no anomalies that would have precluded operation. Borescope examination of cylinder No. 3 revealed catastrophic damage, including heavy mechanical damage to the piston and separation of the exhaust valve, a portion of which was lodged under the intake valve. The No.

3 pushrods did not display any visible damage or bending. The No. 3 cylinder and piston were removed from the engine and retained for further examination.

The oil sump was removed and exhibited numerous pieces of metal consistent with material from the No. 3 piston head.

There were no other anomalies observed with the engine.

3.4 Engine Exam Photos



Figure 4: Engine and propeller (Courtesy Continental Motors)



Figure 5: Top of engine with cowling removed (Courtesy Continental Motors)



Figure 6: Fuel pump inlet fitting (Courtesy Continental Motors)



Figure 7: No. 3 cylinder valves (Courtesy Continental Motors)



Figure 8: No. 3 cylinder piston (Courtesy Continental Motors)



Figure 9: Oil sump contents (Courtesy Continental Motors)

Submitted by: Allison Diaz