



RECORD OF EXAMINATION

Mitchell Gallo
Aviation Accident Investigator
Central Region

Participants: John Butler; Lycoming Engines
Darrin Divis; Federal Aviation Administration (FAA); Flight Standards
District Office, Lincoln, Nebraska

NTSB Accident Number: CEN18FA126

Narrative:

The airplane was about ¼ mile from the extended center line of runway 11 at an elevation of approximately 1,609 feet msl. The airplane was upright and oriented on a tail-to-nose heading of about 330 degrees. The airplane canopy was attached and closed. Ground scarring extended from about 42 feet behind the airplane tail on approximate heading as that of the airplane. Beginning at about the 42-foot point to about 26 feet behind the airplane tail, there were three parallel linear marks in the ground in direction of the airplane that had approximately no parallel offset from each other. These three marks were followed by a mud and water filled hole that was about one foot deep. The edge of the hole nearest the airplane tail contained a propeller blade. The parallel marks were consistent with impressions from the main and nose landing gear wheels. The offset of the landing gear marks, the location and depth of the hole, and the propeller blade location were consistent with a nose-low impact attitude. The bottom nose cowl and nose landing gear was crushed upward into the engine.

The two-blade wood propeller was broken off at the blade roots and separated through in areas along their span. The propeller hub was attached and was secure to engine crankshaft propeller hub flange.

Examination of the flight controls confirmed flight control continuity from the control surfaces, which were attached, to both cockpit control sticks and rudder pedals. The cockpit control sticks were undamaged. The wing flaps were extended to 40 degrees, and the cockpit flap control handle was in the 40-degree flap extended position. The cockpit elevator trim position indicator, which had a red line, was about mid-travel along the jackscrew traversed by the indicator. The indicator's red line was in line with a piece of masking tape, which had a black line, on the housing of the trim indicator.

The master switch and electrical auxiliary fuel pump switches were in the ON position and were turned off by first responders. Both magnetos were in the ON position. The electric auxiliary fuel pump was removed and connected to a car battery, during which air was drawn into and expelled from the pump. The auxiliary fuel pump revealed no mechanical anomalies.

The cockpit throttle control was about ½ inch forward of its aft stop position. The mixture control was about ½ inch from the forward stop. The carburetor heat cockpit control was at the forward OFF position. Throttle and mixture control continuity to the engine was confirmed.

The fuel tank filler cap was in place and secure. The fuel tank filler cap was removed at the accident site and the fuel tank was about 7/8 full with a liquid consistent in smell and color of 100 low lead (100 LL) fuel. The fuel tank was comprised of two tanks, left and right, oriented laterally, with a bottom interconnect between them. Both tanks were not deformed and/or collapsed; The ¼ inch fuel tank vent line was unobstructed. Upon recovery of the airplane, fuel drained out of the fuel tank. The left and right tank interconnect was broken open, which allowed fuel to drain during the recovery of the airplane. Both tanks had black colored fuel supply lines connected to the bottom of each tank. Both tanks were cut open during the investigation and swabbed along their bottoms with water sensing paste. There was no indication of water at the completion of the swabbing. Both tanks contained dark colored debris consistent in appearance with dirt/sediment. Both feed lines had in-line valves that were in the ON position and were connected single main fuel supply line. All the fuel lines from the fuel tanks to the engine were attached and not broken open.

The gascolator contained about ¼ full of a liquid consistent with 100 LL fuel. This liquid was tested with water sensing paste, and there was no resultant indication of water. The bottom of the gascolator bowl had debris that was estimated to be less than 1% in volume of the bowl and was similar in appearance to the debris in the left and right sides of the fuel tank. The gascolator screen was unobstructed.

The airplane was equipped with a Lycoming O-320-A2B, serial number L-12206-27, engine. The top spark plugs were removed, and the engine was rotated by hand through the attached propeller. During the rotation, a spark was obtained from each ignition harness lead. Air was expelled out of and drawn into each top spark plug hole, and compression was felt through the top spark plug holes during the rotation. The intake and exhaust valves sequentially opened and closed without anomaly. Ignition timing was checked with a timing light that confirmed timing in accordance to the engine manufacturer's specifications. The spark plugs displayed features of normal engine operation.

The engine driven fuel pump was removed from the engine and about 15 mL of liquid consistent with 100 LL was drained from the inlet and exit ports. The drained liquid was tested with water sensing paste and there was no indication of water. While the pump actuating arm was actuated using hand pressure, air was drawn into the inlet and expelled from the outlet. During actuation, the diaphragm was heard to actuate. The pump was disassembled, and the pump and diaphragm did not display any mechanical/material anomalies that would have precluded normal operation, and there was no debris.

The carburetor had a data plate with a red background inscribed with the following: Precision Airmotive Corporation, model MA-4SPA, part number 10-5009, serial number BL-18-7306. The carburetor float chamber was broken off, and the brass colored float was attached to a piece of the chamber housing by the carburetor float arm. The throttle control cable was attached to the carburetor throttle control arm, which was attached a piece of the carburetor housing. The float was crushed inward, did not exhibit any

holes, and did not contain fluid within the float. The carburetor fuel screen was removed, and it contained debris consistent with that of the debris in the gascolator and the left and right sides of the fuel tank. The debris on the fuel screen was estimated to cover about 0-5% of the screen with the remainder of the screen unobstructed.

Both seat cushions were about an inch thick and filled with a filler consistent with non-energy absorbing material. The seat cushions were attached to an underlying tubular frame that was above the center section wing spar. The left side pilot seat, which was occupied by the pilot, had the left most underlying seat frame tubing deformed onto the center wing spar, and the right-side frame had about half a similar tubing deformed onto the spar. The pilot was wearing the airplane equipped seat belt and shoulder harness; their adjustment was examined and found to be loose in fit.

The EFIS display was removed for shipment to the (NTSB) Recorders Laboratory for download of nonvolatile memory.

Mitchell Gallo