

NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SUMMARY OF AIRCRAFT EXAMINATION

-- CEN21LA325 --

A. ACCIDENT

Location: Longmont, Colorado
Date: July 18, 2021
Time: 0850 central daylight time
Aircraft: Beech 35-C33 (s/n CD-959), N18AR

B. PARTICIPANTS

Timothy Sorensen
Senior Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Andrew Hall
Chief Air Safety Investigator
Textron Aviation
Wichita, Kansas

C. ACCIDENT SUMMARY

On July 18, 2021, about 0850 mountain daylight time, a Beech 35-C33 airplane, N18AR, was substantially damaged when it was involved in an accident near the Vance Brand Airport (LMO), Longmont, Colorado. The pilot and passenger sustained serious and minor injuries, respectively. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

E. DETAILS OF AIRCRAFT EXAMINATION

Post-recovery airframe and engine examinations were conducted at Beegles Aircraft Services (Greeley, Colorado) on December 1, 2021. Textron Aviation provided support as a party to the investigation. The examinations were completed under direct oversight of the NTSB investigator-in-charge.

Summary of Aircraft Examination

F. SUMMARY OF AIRCRAFT EXAMINATION¹

Airframe – Beech 35-C33 (s/n CD-959)

The lower fuselage, nose section, and engine cowling were damaged consistent with impact forces.

Both wings had been removed to facilitate recovery. The left wing sustained leading edge and localized lower skin/structure impact damage. The outboard portion of the right wing sustained deformation and scuffing damage. The wing damage appeared consistent with impact forces. Both ailerons and flaps remained attached. Both ailerons were intact. The left flap was damaged at the inboard end; the right flap was intact. Aileron and flap control continuity was confirmed from each control surface to the wing roots.

Both horizontal stabilizers and elevators, and the rudder had been removed to facilitate recovery. They appeared to be intact and undamaged.

Aileron control continuity from the control wheel to the left-wing root exhibited binding consistent with the lower fuselage damage. Continuity to the right-wing root was confirmed. Elevator control continuity was confirmed from the control wheel to the aft fuselage. Rudder control continuity was confirmed; however, rudder pedal travel was limited consistent with the lower fuselage damage.² The elevator trim tab actuators had been removed from the airframe and determined to not be at a reliable setting.

The fuel selector was intact and free to rotate. The selector was in the OFF position at the time of the exam. The left and right fuel tank inlet screens were intact, clear of debris, and secured to the fuselage section of the fuel lines. Pressurized air was applied at both wing root fuel inlets. No air was observed at the engine-driven fuel pump inlet line when the selector was in the OFF position. With the selector positioned to the LEFT tank and air applied at the left-wing root, air flow and expelled residual fuel was observed at the fuel pump inlet line. With the selector positioned to the RIGHT tank and air applied at the right-wing root, air flow and expelled residual fuel was observed at the fuel pump inlet line. No air flow was detected when the selector was positioned to either opposite fuel tank.

The auxiliary (electric) fuel pump switch was in the OFF position at the time of the exam. The electrical fuel pump was not examined.

Each fuel cap was securely installed. Borescope examination of the inboard portions of each fuel tank bladder were unremarkable. The fuel tank outlet and sump drain areas appeared undamaged. No debris or sediment was observed in either tank.³

Fuel samples retained by recovery personnel exhibited a blue tint consistent with 100 low lead aviation fuel. In addition, a fuel sample recovered from the fuel sump during the examination was identical in appearance to the other samples. Each sample was tested with water finding paste and no water was detected in any of the samples.

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

² Recovery personnel reported that the flight control cables at wing roots and empennage were connected prior to recovery from the accident site. Continuity was established prior to disassembly.

³ Recovery personnel reported that about 60 gallons of fuel were recovered from both wing fuel tanks prior to recovery from the accident site.

Summary of Aircraft Examination

F. SUMMARY OF AIRCRAFT EXAMINATIONS *(continued)*

Engine – Continental IO-470N (s/n 95353-1-N)

The engine remained attached at the mounts. The crankcase and cylinders were intact. The valve covers were securely installed and undamaged. Induction and exhaust ducting was secure. Minor deformation of the exhaust ducting aft of muffler was observed. The muffler was secure and appeared intact. Induction air filter was intact and appeared clear. Fuel metering unit remained attached and was intact. (The inlet fuel screen was not removed due to surrounding cowling damage.) Throttle and mixture control continuity from the cockpit to the fuel metering unit were confirmed.

The engine-driven fuel pump was secure and intact. Fuel lines to the pump were secure and exhibited torque putty. Drive gear and coupling intact. Pump was free to rotate. Pump was provided fuel at the inlet and expelled fuel from the outlet on hand rotation of the input drive.

Internal engine and accessory section continuity were confirmed via crankshaft rotation. Compression/suction was obtained at each cylinder. Rocker arm and valve springs were intact and exhibited movement during crankshaft rotation. Borescope examination of each cylinder was unremarkable.

The upper spark plugs were removed. Each was intact and exhibited normal combustion signatures. The lower spark plugs appeared intact and were securely installed. The lower spark plug electrodes were examined using a borescope and appeared intact.⁴

Magnetos securely attached to the engine. Both p-leads were separated consistent with dislocation of the engine during the impact sequence. Ignition harness was intact and secured at both magnetos and each spark plug. The magnetos provided spark at each upper spark plug electrode upon rotation of the crankshaft.

The fuel manifold valve was intact. The diaphragm and spring were unremarkable. The screen was intact and free of debris. The housing cavity was clear; no fuel was observed in the distributor valve. All fuel injector lines were secure and exhibited torque putty. The fuel pressure line from the manifold valve to the cockpit pressure gauge was separated at the rear engine baffling which consistent with the fuselage impact damage. The fuel injectors were removed and were intact and unobstructed.

The engine oil filler tube, cap, and dip stick were intact. The cap and dip stick were securely installed. The oil quantity was sufficient and exceeded the “full” limit designated on the dip stick; however, the engine was not in a normal, level orientation at the time.

The engine oil filter intact and securely installed. The filter housing was marked “5/7/21” and “7312”. Safety wire was properly installed. The oil filter was not removed. An after-market oil filter adapter was installed.⁵ It appeared secure and exhibited no evidence of oil leaks.

⁴ The lower spark plugs were not removed due to lower cowling damage.

⁵ Documentation on-file with the FAA indicated that an F&M Company, C6LC Oil Filter Adapter was installed in accordance with STC SE09356SC.

Summary of Aircraft Examination

F. SUMMARY OF AIRCRAFT EXAMINATIONS *(concluded)*

Propeller – McCauley 2A36C23-P-EG / S-84B-0 (s/n 758198)

The propeller assembly remained attached to the engine. Both propeller blades remained attached to the hub. The no. 1 blade was loose in the hub. The spinner was attached; it displayed minor denting and scraping damage.⁶ Each blade exhibited distinct curling at the blade tips and chordwise scraping damage. Blade no. 1 displayed leading-edge gouging near the tip.

----- *end of summary* -----

⁶ Several attachment screws were not installed at the time of the examination. A representative of the recovery crew noted that they were installed at the time of the accident. The individual was unsure about why they were not installed at the time of the exam.