



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

March 30, 2020

AIRFRAME & ENGINE EXAMINATION

WPR18FA141

This document contains 7 embedded photos.

(13 Pages)

A. ACCIDENT

Location: Cascade, Idaho

Date: May 13, 2018

Aircraft: Cessna 182G

NTSB IIC: Stephen Stein

B. EXAMINATION PARTICIPANTS

Stephen Stein
Air Safety Investigator (IIC)
National Transportation Safety Board
Federal Way, Washington

Ricardo Asensio
Air Safety Investigator
Textron Aviation
Wichita, Kansas

Bryan Fisher
Aviation Safety Inspector
Federal Aviation Administration
Boise, Idaho

C. DETAILS OF THE INVESTIGATION

C.1 Accident Background

HISTORY OF FLIGHT

On May 13, 2018, about 1230 mountain standard time, a Cessna 182G, N2377R, was destroyed after it collided with mountainous terrain. The private pilot was fatally injured. The personal flight was operated under the provisions of *14 Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the flight that departed Boise Air Terminal/Gowen Field (BOI), Boise, Idaho about 1208 and was destined for Mccall Municipal Airport (MYL), Mccall, Idaho.

According to the pilot's friend, he had recently purchased a hangar at MYL and decided to fly up to the airport to prepare the hangar for a renovation. On the morning of the accident flight, the pilot mentioned to a friend he was with that the cloud layer at MYL was 700 ft and rising, but the highway cameras along his route of flight were showing some obscuration. A few hours later the pilot arrived at a fixed based operator (FBO) and an attendant of the FBO drove him to his airplane.

PERSONNEL INFORMATION

The pilot, age 34, held a private pilot certificate with a rating for single-engine land. The pilot's most recent second-class medical certificate was issued on January 26, 2015, which did not include any limitations.

According to his personal logbook records, which were current as of March 11, 2018, the pilot accumulated a total of 276 total flight hours. His logbook indicated that he had amassed a total of about 4.2 hours in the 90 days that preceded the accident flight, all of which were in the accident airplane make and model. The pilot's most recent flight review was completed on September 3, 2017.

AIRCRAFT INFORMATION

According to Federal Aviation Administration (FAA) records, the airplane was manufactured in 1964 and registered to Nolan W. Smith on September 17, 2013. The airplane was powered by a Continental O-470-R, a direct drive, air cooled, 230 hp engine.

A friend of the pilot's who last flew the airplane on April 29, 2018 reported that he filled the airplane's fuel tanks to their full capacity when he returned the airplane to a tiedown space at BOI. Fuel records indicate the pilot purchased about 40 gallons of 100 low lead aviation grade gasoline about 1700 on April 29, 2018.

METEOROLOGICAL INFORMATION

According to a witness, a pilot departed about 1030 in a Piper Cub bound for BOI on the day of the accident. He flew a direct route to his destination, but when he was about 35 nm south of BOI, he encountered ground fog. After being forced to descend to about 350 ft above ground level, the pilot elected to return to MYL.

The 1153 recorded weather observation at BOI included wind from 230° at 4 knots, visibility 10 statute miles, broken clouds at 7,000 ft and 10,000 ft, temperature 14° C, dew point 07° C, and an altimeter setting of 30.02 inches of mercury.

The 1151 recorded weather observation at McCall Municipal Airport (MYL), McCall, Idaho included wind from 300° at 5 knots, visibility 10 statute miles, few clouds at 2,100 ft, broken clouds 6,000 ft, overcast clouds 9,000 ft, temperature 11° C, dew point 05° C, and an altimeter setting of 30.01 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest in a wooded area approximately 41 nm north of BOI and was oriented on a heading of 195° magnetic. All major structures of the airplane were accounted for at the accident site. The initial impact point (IIP) was identified by two tree scars about halfway up a 70 foot tall tree. The nose landing gear was collocated with the IIP. Wing fragments were distributed along the wreckage path. A ground scar about 12 ft long was located about 20 ft from the main wreckage in the debris path. The left aileron remained attached to the left wing trailing

edge, which was collocated with the left wingtip about 15 ft from the main wreckage. The main wreckage was comprised of the empennage, right wing, main cabin, and engine approximately 110 ft forward of the IIP. The empennage was vertically oriented at rest against the right wing, which was beneath a portion of the cabin and instrument panel. Both propeller blades remained attached to the propeller hub; however, the assembly had separated from the engine crankshaft.

An odor of fuel that resembled 100 low lead aviation grade gasoline was detected on the ground beneath the right wing.

C.2 EXAMINATION

Cockpit/Cabin Observations

Instrument Indications at the Accident Site

Airspeed: 165 kias
Attitude Indicator: Broken
Altimeter: 5,600 ft
VOR: Broken
Vertical Speed Indicator: ~1,500 fpm
Heading Indicator: broken
Turn Coordinator: Intact, operating normally
Ball Deflection: Tube and glass ball intact, operating normally
R and L Fuel Tank Quantities: 0
Oil Pressure: unknown
Oil Temp: unknown
Master Switch: unknown
Magnetos: BOTH
Carburetor Heat: unknown
Circuit Breakers: unknown
Throttle lever: $\frac{3}{4}$ OPEN
Mixture: Full Rich
Flap indicator: unknown
Flap handle: Neutral
Primer: unknown
Transponder: unknown
Trim wheel: destroyed
Tachometer: Digital – 4,894.89 tt

Airframe

Airframe Examination

Wings

Both wings were accounted for at the accident site. The left wing was fragmented and the right wing was intact and separated at the wing root. The right wing bladder tank was breached and the right wing skin that encapsulates the tank had formed a round shape at the wing root. A large concaved depression was observed at the midspan section of the right wing. The flap and aileron

remained attached to the right wing. The right wing skin had split open at the outboard leading edge. Both the main and balance aileron cables were continuous from their attachments at the control surfaces to the wing root. The right flap jackscrew was observed in the neutral position, consistent with a zero flap deployment. The flap indicator cable displayed evidence of overload separation and the flap control cable had separated from the left wing bell crank.

The left wing fuel tank was breached, and contained within the inboard left wing, which was attached to the main cabin roof. A large section of left wing airframe skin that spanned about the length of the wing had torn free from the wing. The left flap separated from the wing along with a portion of the aft spar. The left aileron remained attached to a section of left wing skin, which had separated from the forward spar. The left wingtip was separated. Both the main and balance cables were continuous from the midspan section of the wing to the bell crank. The left aileron push/pull tube separated at the bell crank and the left flap push/pull tube remained attached to the bell crank.

Cabin

The main cabin and instrument panel exhibited significant deformation; however, the cockpit control cables were all accounted for. The aileron main cables were continuous from the cockpit to the right wing root and the left wing about midspan. The elevator control cables were traced from the cockpit controls to the main cabin where they had been cut by recovery personnel. Intermediate segments of the elevator, elevator trim, and one rudder cable showed evidence they were cut by recovery personnel. Another rudder cable was continuous from the cockpit to the aft fuselage.

Empennage

The aft fuselage was attached to the empennage, which was comprised of the right and left horizontal stabilizers and the vertical stabilizer. The right elevator was attached to the right horizontal stabilizer and the left elevator was separated from the left horizontal stabilizer. The rudder cables were continuous from the aft fuselage to the rudder. Both elevator cables were continuous from the aft fuselage to the bell crank. The elevator trim cables were traced from the aft fuselage to the elevator trim tab and the right elevator actuator rod measured about 1.5 inches consistent with a 10° up deflection.

Fuel System

The fuel selector valve was intact and found in the BOTH tank detent. The unit rotated normally to the BOTH, LEFT, RIGHT and OFF positions. The gascolator case had separated from the unit, which exposed a screen that was free of debris.

Engine

Mechanical continuity was established throughout the rotating group, valve train and accessory section as the engine was manually rotated at the propeller. Thumb compression and suction

were obtained for all six cylinders. The combustion chambers remained mechanically undamaged, and there was no evidence of foreign object ingestion or detonation.

The ignition system was functionally tested with the original ignition harness while the crankshaft was manually rotated. Some of the ignition harness leads sustained tearing or pinching during the accident and did not display spark. As the crankshaft was rotated, the top left spark plugs and bottom no. 5 cylinder spark produced a spark when the audible snaps of the impulse coupling from the left magneto were heard. During a subsequent rotation, the top right spark plugs produced a spark when the audible snaps of the impulse coupling from the right magneto were heard. An examination of the top and bottom spark plugs revealed signatures consistent with normal wear.

The carburetor was partially separated from the engine, and remained attached to the wye plenum. The throttle linkage remained attached to the throttle arm and the mixture linkage remained attached to the throttle plate, but were damaged. Manual movement of the throttle and mixture levers resulted in coinciding movement of their respective shafts. The metal carburetor floats were normal in appearance, but did not display any residual fuel.

The two-blade, variable-pitch propeller was separated from the crankshaft and propeller mounting bolts were stripped from the hub. Both blades displayed twisting toward low pitch and chord-wise paint erosion.

EMERGENCY LOCATOR TRANSMITTER (ELT)

The ELT was a Donne & Margolin 6.1 technical standing order 91.



Photograph 1: Initial Impact Point



Photograph 2: Ground Scar



Photograph 3: Right Aileron Cable



Photograph 4: Right Flap Balance and Main Cables



Photograph 5: Flap Jackscrew



Photograph 6: Left Aileron Main and Balance Cables

Elevator Trim Actuator



Photograph 7: Elevator Trim Actuator