



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

July 13, 2020

AIRPLANE & ENGINE EXAMINATION

WPR19LA200

This document contains 3 embedded photos.

(7 Pages)

A. ACCIDENT

Location: Battleground, Washington

Date: July 20, 2019

Aircraft: Beechcraft Bonanza F33A

NTSB IIC: Stephen Stein

B. EXAMINATION PARTICIPANTS

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

Darren Vaughn
Aviation Safety Inspector
Federal Aviation Administration
Portland, Oregon

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Air Safety Investigator
Continental Aerospace Technologies
Mobile, Alabama

C. DETAILS OF THE INVESTIGATION

HISTORY OF FLIGHT

On July 20, 2019, about 1620 Pacific daylight time, a Beechcraft F33A, N873BC, was substantially damaged during a runway excursion near Parkside Airpark (WA87), Battleground, Washington. The commercial pilot and pilot-rated passenger were not injured. The airplane was registered to and operated by the pilot as a personal flight, conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and a flight plan was not filed, for the cross-country flight that originated from Jefferson County International Airport (0S9), Port Townsend, Washington at 1511.

According to the commercial pilot, they were returning to his home airport after having lunch at 0S9. The pilot entered a descent from a cruise altitude of 5,500 ft mean sea level (msl) approximately 16 nm from his destination airport. He leveled off at 1,000 ft and observed the windsock as he overflew the airport, which showed a light easterly wind. The pilot then entered the right downwind leg of the airport traffic pattern to land on the eastern runway. He touched down close to the runway threshold at an approximate approach speed of 70 kts. During the landing roll, the pilot noticed that his airspeed did not decrease as it normally had during previous flights. Additionally, the engine rpm was higher than normal. The pilot attempted to reduce the engine power by retarding the throttle control, but did not observe a response from the

engine. As they were approaching the runway edge, the pilot retarded the mixture control to IDLE/CUTOFF; however, the airplane overran the runway edge, traversed an adjacent road and the left wing impacted a metal pole before the airplane came to rest.

Postaccident examination of the airplane by the Federal Aviation Administration revealed substantial damage to the left wing.

AIRCRAFT INFORMATION

Federal Aviation Administration records showed that the airplane was manufactured in 1988 and registered to the owner on April 16, 1997. The airplane was powered by a Continental IO-520-BB, air cooled, 285 horsepower reciprocating engine. Maintenance records showed that the airplane's most recent annual inspection was completed on March 28, 2019 at a total time of 1,630 flight hours, about 4 hours prior to the accident.

A review of the aircraft logbooks from May 5, 1998 to present showed multiple entries that indicated the "entire aircraft" had been "lubricated." Although some of the entries stated that the controls were "checked," none of them indicated that the throttle control had been tested or inspected.

METEOROLOGICAL INFORMATION

The 1553 recorded weather observation at Scappoose Industrial Airpark, Scappoose, Oregon, located about 13 nm west of the accident site included wind from 360° at 07 knots, visibility 10 statute miles, clear sky, temperature 30° C, dew point 08° C, and an altimeter setting of 29.96 inches of mercury.

ADDITIONAL INFORMATION

Photographs furnished by the accident pilot showed that the airplane came to rest about 300 ft forward of the departure end of runway 07. The right main landing gear was collapsed and the airplane was resting on the right wing. According to the pilot, he hoisted the airplane, unfolded the right main landing gear and used several pieces of wood and a clamp to brace the broken landing gear locking mechanism. He then towed the airplane to his hangar where it remained until the day of the examination.

An inspection and engine run were performed at the owner's home on November 5, 2019 by the engine manufacturer with oversight from the National Transportation Safety Board Investigator-in-Charge and a representative of the Federal Aviation Administration.

The airplane was stored upright in the pilot's hangar. A large impact gouge about 3 feet in length was observed in the leading edge of the outboard left wing (photograph 1). Several minor compression wrinkles were found along the outboard right wing on the top of the wing and the right wing flap was damaged inboard. The pilot reported that he had deployed the wing flaps to their full positions for the landing phase of the accident flight. The postaccident inspection

revealed that the left wing flap was in the fully deployed position and the right wing flap, which was rest on the ground at the accident site, was not fully deployed.

An inspection of the engine compartment did not reveal any anomalies including loose cables, wires, hoses, or tubes. Throttle and mixture continuity were confirmed from the cockpit to the throttle and mixture controls. The throttle body actuated from the FULL OPEN position to the FULL CLOSED position and the mixture control moved from the RICH position to the LEAN position. Both controls were smooth and continuous.

Engine Run

The airplane was then towed from the hangar to an adjacent area. The wheels were chocked and the parking brake was applied for an engine run.

The engine was started using a normal procedure provided by the accident pilot. These procedures included:

- Master – ON
- Fuel Selector – Desired tank
- Mixture – Full Rich
- Propeller – Forward
- Throttle – Full Open
- Fuel Pump – ON until fuel flow peaks
- Fuel Pump – OFF
- Throttle – ½” Open (note: checklist says ¼” open)
- Engage starter

The engine was run for about 3 minutes at 800 rpm to warm up. During this time the engine rpm advanced to 1,200 rpm three times without manual intervention. The throttle setting did not change after the throttle friction was placed in its maximum closed position. A magneto test was performed after the engine power was advanced to 1,800 rpm, which showed a magneto drop of about 25 rpm for the left magneto and a drop of about 30 rpm for the right magneto. The engine power was then advanced to maximum power momentarily before the engine was shut down. During the initial tests, the engine sounded smooth and continuous and did not display any interruptions in power.

A second engine run was accomplished to examine the security of the throttle control mechanism. The engine was started and placed in an idle power setting, around 600 rpm and the throttle friction was progressively loosed; however, the throttle remained secured in its position. The throttle was then advanced to various power settings (800 rpm, 1,200 rpm, and then 1,800 rpm) and did not advance without manual intervention. During a subsequent test, the throttle was reduced to 800 rpm using the push-button mechanism, which became stuck in a halfway depressed position (photograph 2). Additional tests found that the push-button intermittently stuck in the throttle mechanism and when the throttle was further retarded by rotating the throttle counterclockwise, it advanced about 500 rpm without manual intervention.

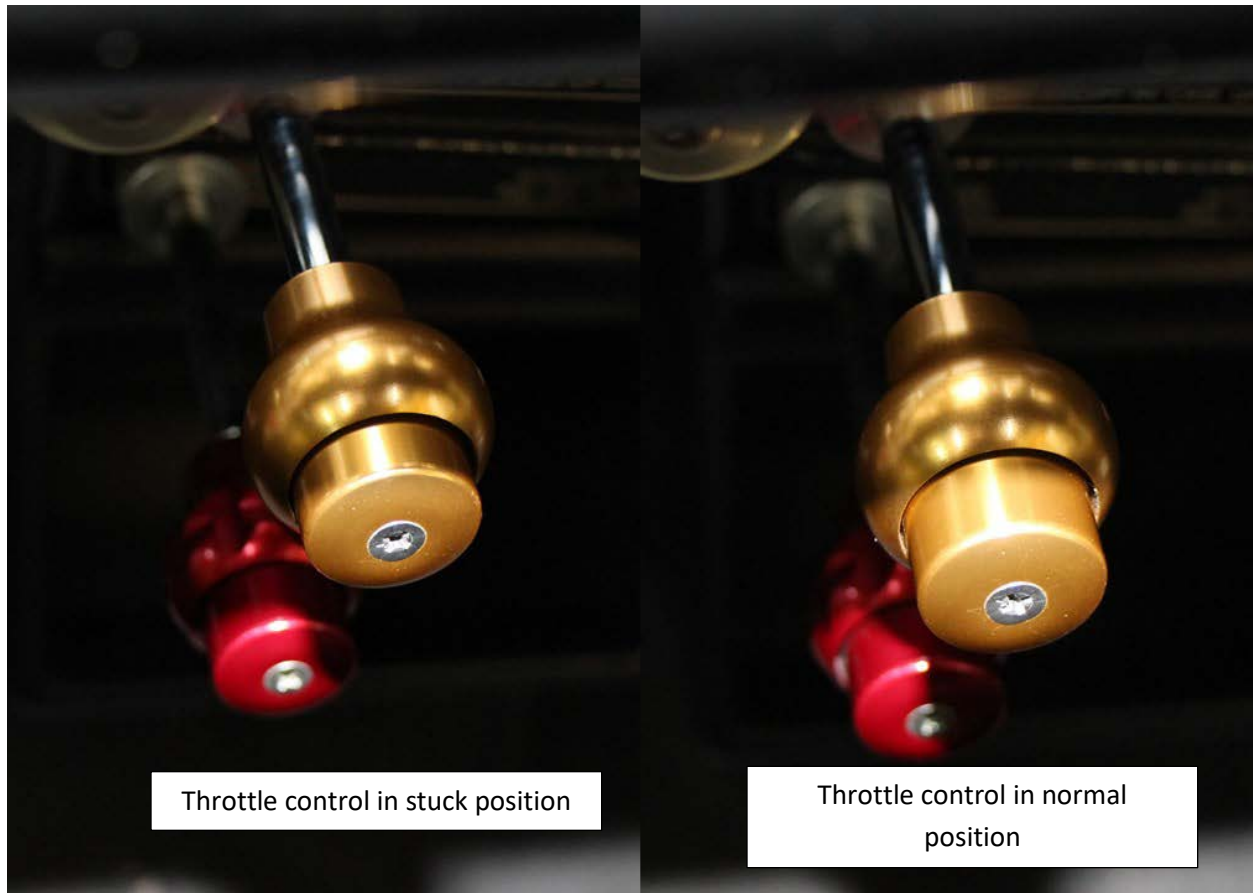
According to the pilot, he reduced the throttle to the closed position (idle power) before the airplane touched down near the runway threshold on runway 07 about 70 knots. The airplane was about 700 ft into the landing roll when the pilot observed that the airplane had not decelerated. He used the rotating mechanism on the throttle control to make a minor power reduction again. The airplane did not decelerate and the pilot retarded the mixture control to the lean position before the airplane overran the runway end and crashed.

The pilot stated that he normally uses the push-button mechanism on the throttle to reduce power after takeoff and for larger reductions in power during flight. He uses the rotation mechanism in the throttle mechanism to reduce power by 200-300 rpm by rotating the throttle counterclockwise.

The throttle control assembly was subsequently disassembled and examined. According to a specification furnished by the airplane manufacturer, all the components were accounted for (*photograph 3*); however, the 8 tooth AN936-A616 lock washer appeared to have been replaced with an unidentified 16 tooth washer. Additionally, while the PP-4405 spring held compression, the nut, which could not be identified, was not tight and could be easily removed by hand.



Photograph 1: View of Left Wing Leading Edge



Photograph 2: Throttle Control Assembly in Stuck and Normal Positions



Photograph 3: Throttle Control Assembly Disassembled