Aviation Investigation Final Report

Location:	Battleground, Washington	**Accident Number:**	WPR19LA200
Date & Time:	July 20, 2019, 16:20 Local	**Registration:**	N873BC
Aircraft:	Beech 33	**Aircraft Damage:**	Substantial
Defining Event:	Powerplant sys/comp malf/fail	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot selected the most favorable runway and flew his approach to land at his home airport. The airplane touched down normally near the runway threshold at the pilot's normal landing speed. Based on landing distance calculations, he should have been able to stop the airplane before the end of the runway. However, it was not until the airplane was about midfield that the pilot realized the airplane was not decelerating. At this point, the pilot attempted to reduce power further by twisting the knob of the throttle control counterclockwise, but the engine power did not decrease. As the airplane rapidly approached the end of the runway, the pilot used the mixture control to shut down the engine, but the airplane overran the runway end and the left wing impacted a pole, which resulted in substantial damage.

Postaccident examination of the airplane revealed no anomalies with the engine and most of the engine controls except for the throttle control. During engine runs, the throttle knob push button became intermittently stuck in a depressed position. Normally, turning the throttle knob counterclockwise from this position would reduce power; however, during the postaccident engine runs, a corresponding minor increase in power was observed. Although disassembly of the throttle mechanism revealed a loose nut in the throttle control assembly, it likely did not contribute to the throttle failure, as the nut would not have affected the knob's use to make power adjustments. Further, the throttle control could still be manipulated by rotating the throttle knob during the postaccident engine run.

Based on the pilot's practices, it is likely that the pushbutton became partially depressed when the pilot reduced the engine power to descend while inbound to his home airport. When the pilot realized the airplane had not decelerated and attempted to make a minor power adjustment by rotating the throttle knob counterclockwise, the throttle control failed, and the pilot either experienced sustained or a subtle increase in engine power, which resulted in a runway overrun and impact with an obstacle. The reason for the failure of the throttle control assembly could not be determined based on available evidence.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A failure of the throttle control assembly for reasons that could not be determined based on available evidence, which resulted in a runway overrun and impact with an obstacle.

Findings

Aircraft	Power lever - Failure
Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Landing-landing roll	Powerplant sys/comp malf/fail (Defining event)
Landing-landing roll	Runway excursion
Landing-landing roll	Collision with terr/obj (non-CFIT)

On July 20, 2019, about 1620 Pacific daylight time, a Beechcraft F33A, N873BC, was substantially damaged when it was involved in an accident near Parkside Airpark (WA87), Battleground, Washington. The pilot and pilot-rated passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, they were returning to his home airport after having lunch at another airport. The pilot entered a descent from a cruise altitude of 5,500 ft mean sea level (msl) approximately 16 nautical miles from his destination airport. He leveled off at 1,000 ft and observed the windsock as he overflew the airport, which indicated a light easterly wind. The pilot then entered the right downwind leg of the airport traffic pattern to land on runway 07. He touched down close to the runway threshold at 70 kts with the throttle near idle power. Approximately 700 ft into the landing roll, the pilot noticed that his airspeed had not decreased as it normally had during prior landings. Additionally, the engine rpm was higher than normal.

The pilot attempted to reduce the engine power by twisting the knob of the throttle control counterclockwise, but he did not observe a decrease in engine power. As the airplane approached the end of the runway, the pilot used the mixture control to shut down the engine. However, the airplane overran the end of the runway, traversed an adjacent road, and the left wing impacted a metal pole before the airplane came to rest. During the accident sequence, the airplane's left wing was substantially damaged.

The pilot stated that he normally uses the pushbutton mechanism on the throttle to reduce power after takeoff and for greater reductions in power during flight. He uses the twist function of the throttle knob to make minor adjustments in power.

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 disassembled and inspected; however, this was not required as the throttle control was a sealed assembly.

The airplane was equipped with a throttle control assembly that allowed the pilot to make fine adjustments to the power setting. The throttle assembly was comprised of a compression spring, a knob, and the throttle cable, which was attached to a button at the end of the knob with an AN924-3D nut and an AN936-A616 lock tooth washer. To make a minor power

adjustment, the pilot rotated the knob clockwise to increase power and counterclockwise to decrease power. For large power adjustments, the pilot depressed the button and either pushed the knob forward to advance the throttle or pulled the knob aft to retard the throttle.

An inspection and engine run were performed at the owner's home by the National Transportation Safety Board investigator-in-charge, a representative of the Federal Aviation Administration, and the engine manufacturer. Throttle and mixture continuity were confirmed from the cockpit to the throttle and mixture controls.

The engine was run for about 3 minutes at 800 rpm to warm up before an engine run-up was performed. The engine was then advanced to its maximum rated power momentarily before it was shut down. During these 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. During this test, the throttle was reduced from 1,800 rpm to 800 rpm using the pushbutton mechanism, which became stuck in a halfway depressed position. With the button stuck in this position, an engine power reduction was attempted by rotating the knob counterclockwise. This movement would normally reduce engine power; however, only a corresponding minor increase in power was observed. This test was repeated multiple times with the same result.

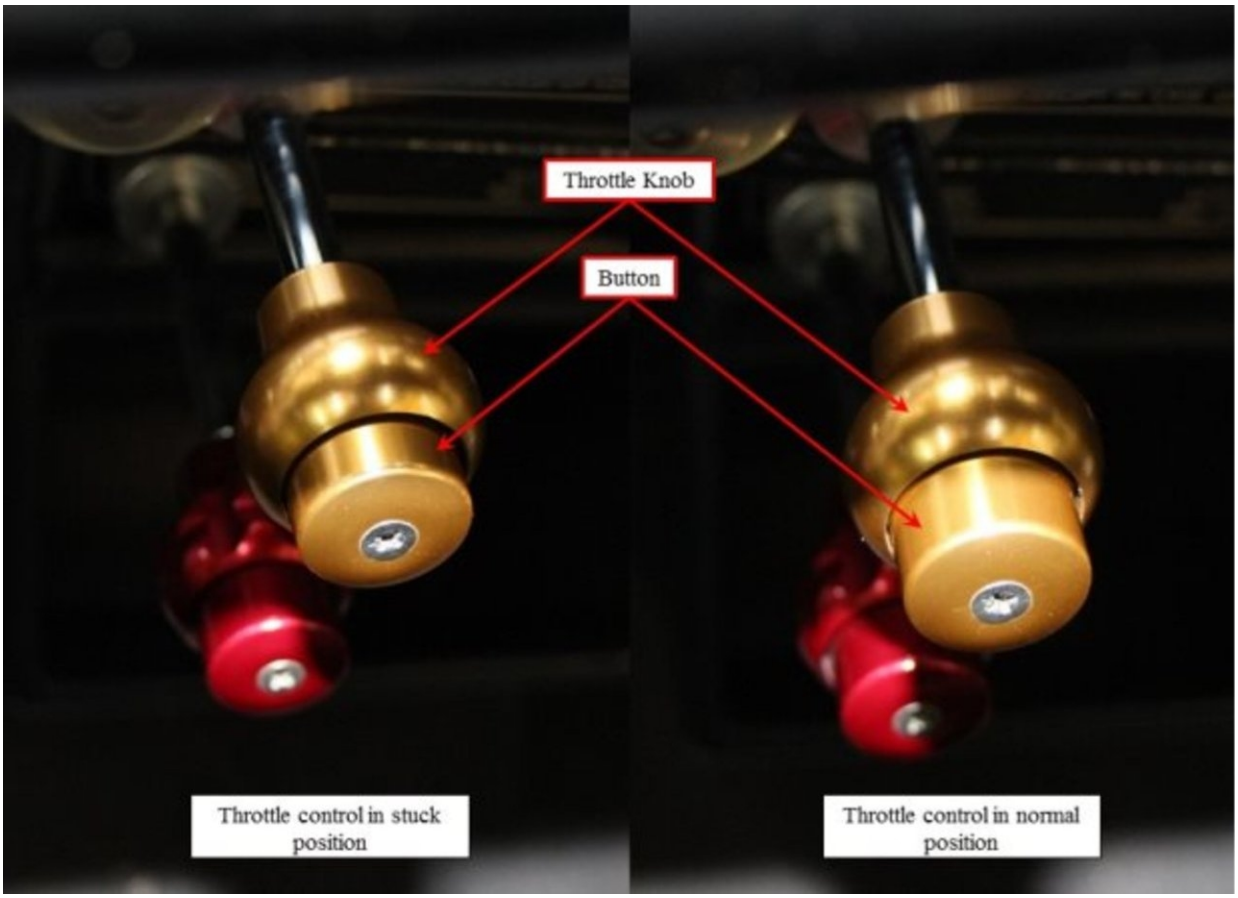

Figure 1: Throttle Control in Both Stuck and Normal Positions

Disassembly of the throttle mechanism revealed that the spring and washer were present and had been installed correctly. The spring did not display any debris or anomalous wear that could have inhibited its movement. The throttle cable was secured with the nut and washer; however, the nut was loose and could be easily manipulated by hand. According to the manufacturer, a loose nut would prevent the knob from being held against the throttle shaft. This could allow the knob to spin freely when rotated by the pilot, thus preventing the throttle cable from moving in and out. If the nut was completely loose, the knob could separate from the throttle shaft. However, the loose nut would generally not impact the functionality of the button if the knob was not near the point of separation.

WA87 was a private airport with one runway in an east/west configuration. The runway dimensions were 2,100 ft long and 25 ft wide.

Performance computations of the airplane's landing distance were completed using a temperature of 29° C, a total weight of 3,100 lbs, and a headwind of 10 kts. These figures were plotted using the landing distance chart from the pilot's operating handbook, which showed the airplane's ground roll would have been about 710 ft.

Pilot Information

Certificate:	Commercial	**Age:**	82,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 19, 2018
Flight Time:	15650 hours (Total, all aircraft), 960 hours (Total, this make and model), 4 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N873BC
Model/Series:	33 F33A	**Aircraft Category:**	Airplane
Year of Manufacture:	1988	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	CE-1227
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	March 28, 2019 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1634 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed	**Engine Model/Series:**	IO-520-BB37B
Registered Owner:	On file	**Rated Power:**	285 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	275 ft msl	**Distance from Accident Site:**	90 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	13°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	30°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Port Townsend, WA (0S9)	**Type of Flight Plan Filed:**	None
Destination:	Battleground, WA (WA87)	**Type of Clearance:**	None
Departure Time:	15:11 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Parkside Airpark WA87	**Runway Surface Type:**	Asphalt
Airport Elevation:	275 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	E	**IFR Approach:**	None
Runway Length/Width:	2100 ft / 25 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	45.819999,-122.550003(est)

Administrative Information

Investigator In Charge (IIC):	Stein, Stephen
Additional Participating Persons:	Kenneth Bradshaw; Federal Aviation Administration; Hillsboro, OR Henry Soderlund; Textron Aviation; Wichita, KS Kurt Gibson; Continental Aerospace Technologies; Mobile, AL
Original Publish Date:	May 19, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99924