



National Transportation Safety Board Aviation Accident Final Report

Location:	St. Augustine, Florida	Accident Number:	ERA19LA268
Date & Time:	September 11, 2019, 17:30 Local	Registration:	N5300E
Aircraft:	Beech K35	Aircraft Damage:	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	Injuries:	2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a personal flight when, about halfway through the landing rollout and before the pilot could apply the brakes, the airplane suddenly veered to the right. The pilot attempted to correct the veer with left pedal and brake but was unsuccessful. The airplane departed the runway into the grass, struck a berm, flipped over, and came to rest inverted. The airplane sustained substantial damage to the forward fuselage, horizontal stabilizers, and left ruddervator.

Postaccident examination of the airplane revealed that the right main landing gear tire had a flat spot in its tread that was worn to the reinforcement chords. The tire left a black skid mark on the runway that led from the right edge to the grass, consistent with a locked right wheel. The wheel rotated smoothly during recovery of the airplane; therefore, damage or malfunction of the wheel's bearings was unlikely. The airplane did not have the optional copilot-side brake pedals installed.

Examination of the brake system revealed that the brakes functioned normally; however, the right caliper was found to have some play between the two anchor bolts and their bushings in the torque plate. Excessive caliper play can result in too much clearance between the brake pads and the brake disc. The excessive clearance can cause the brake pads to shift out of place and jam against the brake disc, which could result in an unintended brake application. Disassembly and further examination of the primary brake system components revealed no other anomalies that would have precluded normal operation. Therefore, the right brake was likely applied unintentionally due to the play between the caliper anchor bolts and their bushings. The play likely developed due to wear on the anchor bolts, the bushings, or both.

Probable Cause and Findings

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

An unintended brake application of the right main landing gear brake system during the landing rollout due to excessive play between the brake caliper anchor bolts and their bushings.

Findings

Aircraft

Brake - Fatigue/wear/corrosion

Factual Information

On September 11, 2019, about 1730 eastern daylight time, a Beech K35, N5300E, was involved in an accident at Northeast Florida Regional Airport (SGJ), St. Augustine, Florida. The commercial pilot and pilot-rated passenger sustained minor injuries, and the airplane was substantially damaged. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

According to the pilot, about halfway through the landing rollout on runway 13, the airplane suddenly veered to the right with the engine power at idle. She attempted to correct the turn with left pedal and brake but was unsuccessful. She confirmed with the pilot-rated passenger that the power was at idle. The airplane departed the runway into the grass, struck a berm, flipped over, and came to rest inverted. The pilot further stated that the veer to the right occurred before she could apply the brakes or retract the flaps from the 10° position.

The airplane did not have the optional copilot-side brake pedals installed.

The airplane's most recent brake maintenance was performed on January 24, 2019, the same day as the airplane's most recent annual inspection (when the airframe had accrued a total time of 6,462 flight hours). During that maintenance, the right brake caliper was replaced. The airplane had flown about 60 hours since that time.

A Federal Aviation Administration inspector examined the wreckage and the accident site. The examination revealed substantial damage to the fuselage forward of the windscreen, both horizontal stabilizers, and the left ruddervator. A black skid mark was found on the runway that led from the right edge of the runway to the grass.

Both wheel brakes and ruddervators and the nosewheel steering functioned normally when the rudder pedals were pressed. The parking brake was found disengaged. Visual inspection of the brake components revealed no mechanical or thermal damage to the brake discs, calipers, or pad material. No hydraulic leaks were visible on any of the fittings or components. Both main landing gear wheels rolled smoothly when the airplane was moved during recovery. The right main landing gear tire had a flat spot worn through the reinforcement cords in the tire tread.

Review of a video clip that the pilot provided revealed that the right brake caliper had some play between the two anchor bolts (often called "pins") and the bushings in the torque plate (the flange to which the caliper is attached). The caliper shifted about the bolts when moved by hand in a twisting motion.

The right brake master cylinder was removed and disassembled. The o-rings were intact with no signs of leakage. The return spring was intact. The cylinder exhibited no scoring or signatures of abnormal wear. The poppet valve operated normally.

The parking brake actuator valve was sent to the NTSB's Materials Laboratory for examination. The valve operated normally when compressed air was applied to the inlet port. The valve was

then disassembled. The o-ring was intact, and the spring-loaded ball, ball seat, and plunger were undamaged. The plunger moved freely when the actuator arm was moved back and forth.

History of Flight

Landing-landing roll	Sys/Comp malf/fail (non-power) (Defining event)
Landing-landing roll	Runway excursion
Landing-landing roll	Nose over/nose down

Pilot Information

Certificate:	Commercial; Flight instructor	Age:	68, Female
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	August 2, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	January 1, 2019
Flight Time:	11500 hours (Total, all aircraft), 300 hours (Total, this make and model), 11000 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N5300E
Model/Series:	K35 NO SERIES	Aircraft Category:	Airplane
Year of Manufacture:	1958	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	D-5765
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	January 24, 2019 Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:	60 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	6507 Hrs at time of accident	Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	IO-470-C
Registered Owner:		Rated Power:	250 Horsepower
Operator:		Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	SGJ, 10 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	17:56 Local	Direction from Accident Site:	235°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	13 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.11 inches Hg	Temperature/Dew Point:	29° C / 24° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Titusville, FL (TIX)	Type of Flight Plan Filed:	None
Destination:	St. Augustine, FL	Type of Clearance:	None
Departure Time:	16:50 Local	Type of Airspace:	Class C

Airport Information

Airport:	Northeast Florida Rgnl SGJ	Runway Surface Type:	Asphalt
Airport Elevation:	9 ft msl	Runway Surface Condition:	Dry
Runway Used:	13	IFR Approach:	None
Runway Length/Width:	7997 ft / 150 ft	VFR Approach/Landing:	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	29.959167, -81.339721(est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass		
Additional Participating Persons:	Peter Kandravi; FAA/FSDO ; Orlando , FL		
Original Publish Date:	June 22, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=100240		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).