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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA371	06/24/2017 1715	Regis# N7662V	Morgan, UT	Apt: N/a
Acft Mk/Mdl AERO COMMANDER CALLAIR A 9		Acft SN 1390	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-540-B2B5		Acft TT 4159	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: ELK MOUNTAIN SOARING LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: SPR

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## Events

1. Enroute-cruise - Controlled flight into terr/obj (CFIT)
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## Narrative

The pilot reported that, during a positioning flight, about 500 ft, he was flying along a highway and the airplane struck transmission wires. He added that he turned back to the departure airport and landed without further incident.

The airplane sustained substantial damage to both wings.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

According to an employee of the power company, the struck transmission wires were about 93-100 ft above the ground.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA347	06/16/2017 1920 EDT	Regis# N9404E	Watervliet, MI	Apt: Watervliet Muni 40C
Acft Mk/Mdl AERONCA 11AC		Acft SN 11AC-1041	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL A&C 65 SERIES			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: MALONEY, EDWARD M.		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Prior to flight - Aircraft loading event

## Narrative

The flight instructor reported that, during the takeoff climb from a grass runway with the student pilot flying, about 25 ft. above ground the "climb rate became stagnant." He added that he instructed the student to "lower the nose slightly," but after "several seconds the airplane did not resume a normal climb rate." The flight instructor took the flight controls and noticed that they were "sluggish" and it felt as if the airplane was caught in "wind swirls" and downdrafts. Subsequently, the flight instructor made a "small left turn" towards a small gap in the tree line ahead and the airplane impacted a heavily wooded/ treed area.

The fuselage and both wings sustained substantial damage.

The flight instructor reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

According to the flight instructor, the airplane departed "loaded at gross weight." The student pilot reported that the flight instructor did not discuss weight and balance with him prior to flight.

During postaccident interviews with the NTSB investigator-in-charge (IIC), the student and flight instructor each reported their personal weight and a total of 10 gallons of fuel on board at takeoff. Based upon the information provided, the takeoff weight was 1,389 lbs., which was 139 lbs. over the maximum gross weight (1,250 lbs.) published in the airplane pilot's operating handbook (POH). The airplane's center of gravity for takeoff was within limits at 18.65 (12.4 to 22.0).

An automated weather observation station, 8 nautical miles (NM) southwest, about the time of the accident, reported the wind from 200ø at 5 knots, temperature 82øF (28øC), dewpoint 54øF (12øC), and barometric setting of 29.76" Hg. The calculated density altitude 8 NM southwest was 2,648 ft. The flight instructor reported that they took off runway 20, which was 2,600 ft. in length.

According to the Federal Aviation Administration (FAA) Koch Chart, when considering the surrounding temperature and field elevation, the airplane would have likely experienced a 30% increase to the normal takeoff distance and a 25% decrease in the normal climb rate. The airplane's POH did not publish takeoff performance information.

The FAA Pilot's Handbook of Aeronautical Knowledge stated in part:

### Effect of Weight on Flight Performance

The takeoff/climb and landing performance of an aircraft are determined on the basis of its maximum allowable takeoff and landing weights. A heavier gross weight results in a longer takeoff run and shallower climb, and a faster touchdown speed and longer landing roll. Even a minor overload may make it impossible for the aircraft to clear an obstacle that normally would not be a problem during takeoff under more favorable conditions.

### Runway Surface and Gradient

Runway conditions affect takeoff and landing performance. Typically, performance chart information assumes paved, level, smooth, and dry runway surfaces. Since no two runways are alike, the runway surface differs from one runway to another, as does the runway gradient or slope.

Runway surfaces vary widely from one airport to another. The runway surface encountered may be concrete, asphalt, gravel, dirt, or grass. The runway surface for a specific airport is noted in the Chart Supplement U.S. (formerly Airport/Facility Directory). Any surface that is not hard and smooth increases the ground roll during takeoff. This is due to the inability of the tires to roll smoothly along the runway. Tires can sink into soft, grassy, or muddy runways. Potholes or other ruts in the pavement can be the cause of poor tire movement along the runway.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA381	06/04/2017	800 AKD	Regis# N82639	Soldotna, AK	Apt: N/a
Acft Mk/Mdl AERONCA 7AC-NO SERIES			Acft SN 7AC-1281	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONT MOTOR A&C65 SERIES				Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BRENDA DALE			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

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## Events

2. Taxi-from runway - Abrupt maneuver

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## Narrative

The pilot reported that after landing on a gravel airstrip, during the taxi, a moose cow and calf ran onto the airstrip, moving from the pilot's right to left. She added that she veered to the left to avoid the animals and the airplane struck a tree.

The airplane sustained substantial damage to the fuselage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA16CA264	07/20/2016 957 EDT	Regis# N1639E	Connellsville, PA	Apt: Joseph A Hardy Connellsville VVS
Acft Mk/Mdl AERONCA 7BCM		Acft SN 7AC-5204	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL C-85-8		Acft TT 4135	Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: WARREN JOHN L		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The pilot stated that he hand-propped the engine, boarded the airplane, and began to taxi and that, shortly thereafter, the engine "sputtered and stalled." He then realized that he had left the fuel selector in the "off" position. He set the parking brake, turned the fuel on, exited the airplane, and hand-propped the engine again. The engine started and ran at a high rpm. The airplane moved forward and began to spin in circles. The pilot attempted to get back in the cockpit; however, the door had swung closed, and the airplane struck him, knocking him to the ground. The airplane spun a few more times before striking a hangar, which resulted in substantial damage to the right wing, and coming to a stop. Afterward, the pilot recalled that he had forgotten to retard the throttle before attempting the second engine start. The airplane was not equipped with an electric starter.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to properly set the throttle and secure the airplane before hand-propping the engine for startup.

## Events

1. Standing-engine(s) start-up - AC/prop/rotor contact w person
2. Standing-engine(s) operating - Ground collision

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C
2. Personnel issues-Action/decision-Action-Incomplete action-Pilot - C
3. Aircraft-Aircraft handling/service-Parking/securing-Tie-down/mooring-Incorrect use/operation - C
4. Environmental issues-Physical environment-Object/animal/substance-Airport structure-Contributed to outcome

## Narrative

The pilot stated that he hand-propped the engine, boarded the airplane and began to taxi. Shortly thereafter, the engine "sputtered and stalled." He then realized that he had left the fuel selector in the off position. He set the parking brake, turned the fuel on, exited the airplane and hand-propped the engine again. The engine started and ran at a high rpm. The airplane moved forward and began to spin in circles. The pilot attempted to get back in the cockpit; however, the door had swung closed and the airplane struck him, knocking him to the ground. The airplane spun a few more times before striking a hangar, which resulted in substantial damage to the right wing, and coming to a stop. Afterward, the pilot recalled that he had forgotten to retard the throttle before attempting the second engine start. The airplane was not equipped with an electric starter.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA238	06/20/2017	2030 CDT	Regis# N2558E	Mahnomen, MN	Apt: Mahnomen County Airport 3N8
Acft Mk/Mdl AERONCA 7BCM			Acft SN 7AC-6141	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
				Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: HABEDANK MARK P			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

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## Events

1. Initial climb - Aerodynamic stall/spin

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## Narrative

On June 20, 2017, about 2030 central daylight time, an Aeronca 7BCM airplane, N2558E, sustained substantial damage during initial climb from the Mahnomen County Airport (3N8), Mahnomen, Minnesota, when it impacted terrain. The sport pilot was seriously injured. The airplane was owned and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which was not on a flight plan. The airplane was departing 3N8, but the destination is unknown.

A witness reported that he observed the airplane departing the airport. He stated that the airplane appeared to be going slow and not climbing. Then the airplane banked to the right and the airplane impacted the ground in a nose down attitude.

At 2015, the surface weather observation at 3N8 was: wind light and variable; visibility 10 miles; sky clear; temperature 20 degrees C; dew point 8 degrees C; altimeter 29.94 inches of mercury.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# CEN16LA030 10/10/2015 840 MST Regis# N5294Q Albuquerque, NM Apt: N/a  
Acft Mk/Mdl AEROSTAR RX8 Acft SN 3347 Acft Dmg: NONE Rpt Status: Factual Prob Caus: Pending  
Acft TT 172 Fatal 0 Ser Inj 1 Flt Conducted Under: FAR 091  
Opr Name: EATON WILLIAM E Opr dba: Aircraft Fire: NONE  
AW Cert: STB

## Summary

After 50 minutes of flight, the commercial pilot landed the balloon and waited for his ground handling crew to arrive. One passenger exited the basket and the pilot and second passenger remained in the basket. When the ground crew arrived, the second passenger and pilot were beginning to exit the basket when a gust of wind pushed the envelope and basket over to a 45° angle. The pilot asked the passenger to hold on and began pulling the envelope deflation line. After a few seconds, the wind shifted and rotated the basket. The pilot and passenger were tossed out of the basket onto the ground. The passenger fell, resulting in a fracture of her shoulder.

The nearest weather reporting facility, located about 15 nautical miles from the accident site, reported wind at 12 knots. The pilot reported that the wind was variable at 3 knots and gusting to 14 knots. The pilot's delay in pulling the vent line completely and deflating the balloon envelope likely made the balloon uncontrollable when the wind gusted. The pilot stated that he should have had the passenger sit down in the bottom of the basket and should have had the ground crew person release the line when the wind shifted.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's delay in deflating the balloon envelope completely after landing, which resulted in a loss of control due to a wind gust.

## Events

1. After landing - Ground handling event

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Personnel issues-Task performance-(general)-(general)-Pilot - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Gusts-Contributed to outcome

## Narrative

On October 9, 2015, about 0840 mountain standard time, a Aerostar RX8 Balloon, N5294Q, registered to the pilot, encountered a gust of wind after landing. Of the three occupants, the pilot and one passenger were not injured and one passenger sustained serious injuries. The local personal flight was being conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and a flight plan was not filed. The flight originated from the Albuquerque International Balloon Fiesta Park, Albuquerque, New Mexico, about 0750.

The pilot stated that after about 50 minutes of flight, he landed the balloon and waited for his ground crew to arrive. One passenger exited the basket and the second passenger remained in the basket. When the ground crew arrived, the second passenger and pilot were beginning to exit the basket when a gust of wind pushed the envelope and basket over at a 45-degree angle. The pilot told the passenger to hold on and began pulling the envelope deflation red line. After a few seconds, the wind shifted 90-degrees and pushed the envelope and rotated the basket 90 degrees. The pilot and passenger were tossed out of the basket onto the ground. The passenger fell on her right shoulder and struck her head on the burner frame. She was transported to the hospital by ambulance and treated for a fracture of the right shoulder.

About the time of the accident, the nearest weather reporting facility, Albuquerque International Sunport, Albuquerque, New Mexico, located about 15 nautical miles from the accident site, reported wind from 080 degrees at 12 knots. The pilot reported on NTSB Form 6120 that the winds were variable at 3 knots and gusting to 14 knots.

The pilot offered a safety recommendation in the submitted NTSB Form 6120. He stated that he should have had the passenger sit down in the bottom of the basket and should have had the ground line ground crew person release the line when the wind shifted.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA494 08/17/2017 1540 PDT Regis# N8230S Moses Lake, WA Apt: Moses Lake Muni W20  
Acraft Mk/Mdl AEROTECHNIK L 13 SEH VIVAT-SEH Acft SN 930504 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: KASPROWICZ KRZYSZTOF J Opr dba: Aircraft Fire: GRD

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA386	07/05/2017 1230 PDT	Regis# N31MX	Ely, NV	Apt: N/a
Acft Mk/Mdl ALEXANDER SCHLEICHER GMBH & CO	Acft SN 31003	Acft Dmg: DESTROYED	Rpt Status: Factual	Prob Caus: Pending
Eng Mk/Mdl DIAMOND AE50R	Acft TT 567	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091	
Opr Name: HOLLIDAY, ROBERT R.	Opr dba:	Aircraft Fire: NONE		
		AW Cert: SPE		

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## Events

1. Maneuvering - Loss of control in flight

## Narrative

The glider pilot reported that while maneuvering about 10,000 ft. mean sea level he "lost control" and the glider went into a spin, followed by a spiral. He added that he egressed from the glider, deployed his parachute, and was later rescued. The glider impacted terrain and was destroyed.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the glider that would have precluded normal operation.



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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA391	07/01/2017 1520 CDT	Regis# N157WB	Ferguson, FL	Apt: Ferguson 82J
Acft Mk/Mdl AMERICAN CHAMPION AIRCRAFT		Acft SN 1139-2014	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING AEIO-360-H1B		Acft TT 262	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WRONG BROTHER AVIATOR TRAINING SCHOOL, LLC		Opr dba:		Aircraft Fire: NONE AW Cert: STA

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## Events

1. Landing - Loss of control on ground
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## Narrative

The pilot reported that, during the landing roll on the grass runway, the airplane began to veer to the right before the tailwheel was down. He added that he applied left rudder; however, the airplane pitched forward and the propeller struck the ground. Subsequently, the airplane came to rest inverted off the right side of the grass runway.

The airplane sustained substantial damage to the empennage and right wing lift strut.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The automated weather observation system about 3 nautical miles from the accident site, about the time of the accident, reported the wind from 220ø at 10 knots. The pilot landed on runway 18.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA379	07/02/2017 1700 PDT	Regis# N321MW	Rio Vista, CA	Apt: Rio Vista Muni O88
Acft Mk/Mdl AMERICAN GENERAL ACFT CORP AG5-B	Acft SN 10105	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual	Prob Caus: Pending
Eng Mk/Mdl LYCOMING O&VO-360 SER	Acft TT 1880	Fatal 0	Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: JOHN R. TOTH	Opr dba:		Aircraft Fire: NONE	AW Cert: STN

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## Events

2. Approach-VFR go-around - Loss of control in flight

## Narrative

The student pilot reported that, during his second low approach, the airplane was stable at 75 knots and full flaps, about 20 ft. above the ground. He added, that about 5 to 10 ft. above the ground, he applied full power and began to "slowly" retract the flaps. Encountering what he described as "wind shear," he reported that, the airplane became "vertical" and he lost directional control. He added that, he immediately banked to the right and applied full right rudder, subsequently, the airplane's left wing struck the ground. The airplane came to rest off the right side of the runway.

The airplane sustained substantial damage to the left wing.

The student pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The student pilot reported checking the airport's automated weather observation system (AWOS), which was reporting wind from 120ø at 12 knots, prior to the approach. He further reported the sky condition as clear, temperature 84øF, dewpoint 53øF, and wind gusts to 20 knots. The pilot selected runway 15.

As a recommendation, the student pilot reported that he should have avoided areas with gusts greater than 10 knots.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA155	02/24/2017 1720 EST	Regis# N7423D	Statesville, NC	Apt: N/a
Acft Mk/Mdl BALLOON WORKS FIREFLY		Acft SN F7-291	Acft Dmg: NONE	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl BALLOON WORKS T3-017(BURNER)		Acft TT 327	Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: CHARLES T. PAGE		Opr dba:		Aircraft Fire: NONE
				AW Cert: STB

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## Events

2. Landing-flare/touchdown - Cabin safety event

## Narrative

The student pilot and flight instructor of the balloon, were performing their ninth training flight. The instructor reported that during the flight, the student made an approach to a grass field with the airspeed about 5 kts. During the landing there were multiple touch downs and during the first, the balloon "rebounded back up" and touched down again about 65 feet north-west of the initial touch down point. During the second touch down the student pilot put his right foot on the front of the basket to brace for the landing and his left foot remained on the floor of the basket. The balloon touched down and the student pilot rolled his ankle. The balloon "rebounded back up" and the flight instructor pulled the valve line to deflate the balloon. The balloon came to rest about 30 feet further to north-west. The student pilot sustained a broken ankle. The balloon did not sustain substantial damage.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the balloon that would have precluded normal operation.

Per the recommendation of the NTSB Investigator-in-charge, the flight instructor reported:

In an effort to prevent an accident similar to the one that occurred with N7423D, I will brief student pilots as to the importance of bracing oneself correctly and that two feet on the floor during touch downs will provide better stability from the human factors perspective of balance. I will also discuss this event in future safety forums within the balloon community in order to enhance safety. It is my belief that these actions will help to prevent any future occurrences of this nature.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA243	07/14/2017 1930 CDT	Regis# N3282P	Murfreesboro, TN	Apt: N/a
Acft Mk/Mdl BALLOON WORKS FIREFLY 8B		Acft SN F8B-520	Acft Dmg: NONE	Rpt Status: Prelim Prob Caus: Pending
		Acft TT 309	Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: WHEELER ARCHIE J		Opr dba:		Aircraft Fire: NONE
				AW Cert: STB

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## Events

1. Landing - Airport occurrence

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## Narrative

On July 14, 2017, about 1930 central daylight time, a Balloon Works, Firefly 8B-15, N3282P, ascended unintentionally after landing near Murfreesboro, Tennessee. The commercial pilot was not injured and one passenger was seriously injured. The commercial sightseeing flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local flight.

According to the pilot, after a successful flight, all the passengers exited the gondola and were assisting the pilot in securing the gondola. As they were holding on to the maneuvering handles the balloon began to ascend. As it ascended all the passengers except one released the maneuvering handles. That passenger was carried about 30 ft. into the air before letting go and falling to the ground. The pilot regained control of the balloon and landed.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA17CA068 12/12/2016 1530 EST Regis# N776WM New Smyrna Beac, FL Apt: Spruce Creek 7FL6  
Acft Mk/Mdl BEECH A36-UNDESIGNAT Acft SN E-2088 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl CONTINENTAL IO-550-B Acft TT 3451 Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: KRAUS LEE G JR Opr dba: Aircraft Fire: GRD  
AW Cert: STU

## Summary

Passengers reported that, during a winter flight, cold air was entering the airplane from the left side of the passenger cabin. Afterward, the pilot examined the area and discovered that there was a small gap under the emergency exit window that was allowing air to enter the cabin from outside the airplane. He opened the window and examined the rubber seal, which was intact. However, he could not tell if it was compressed or thinner than normal. He then closed and latched the window and inspected the latch with a flashlight to make sure it was latched. Because he was going to fly back to his home airport in similar winter conditions on the next flight, he took several rolled-up paper towels and placed them between the trim and the window to try and keep the cold air out and placed a strip of blue painter's tape on the outside of the lower portion of the window to further reduce the entry of cold air. He decided to fly the airplane once around the traffic pattern before fueling up for his return flight. After takeoff and while on the downwind leg of the traffic pattern at 800 ft, he suddenly heard a "whoosh" behind his seat. Instead of landing and checking to see what happened, he checked for other traffic, turned on the autopilot, in heading and altitude mode, then reached around behind him to shut and latch the window, which had opened 2 to 3 inches. Seconds later, after turning back around to his normal seated position, he heard a loud "pop" and turned around and saw that the window had opened completely. Given that he was afraid it would come off the airplane and strike the tail, he reached back again and pulled the window down. The pilot reported that he must have "bumped" the autopilot off while he was doing this, because when he looked forward to check for traffic, he noticed that the airplane was approaching the ground. He then banked left and right to determine his location and spot any obstacles, raised the nose, and added power to climb. He then noticed that there were power lines slightly higher than his altitude directly in front of him, and rather than risk a possible stall close to the ground by pulling back suddenly, he lowered the nose and "put" the airplane on the ground. The airplane then struck trees, and a fire ensued, which resulted in substantial damage to the airframe. Examination of the emergency exit window by a Federal Aviation Administration inspector revealed that the paper towels the pilot inserted in the gap between the window and the airframe were interfering with the window's latching mechanism.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's inappropriate response to an emergency exit window opening in flight, which resulted in a loss of control, precautionary off-airport landing, and subsequent impact with trees. Contributing to the accident was the pilot's improper repair of the emergency exit window before the flight.

## Events

1. Prior to flight - Miscellaneous/other
2. Approach-VFR pattern downwind - Miscellaneous/other
3. Approach-VFR pattern downwind - Loss of control in flight
4. Emergency descent - Off-field or emergency landing
5. Landing - Off-field or emergency landing
6. Landing-landing roll - Collision with terr/obj (non-CFIT)
7. Post-impact - Fire/smoke (post-impact)

## Findings - Cause/Factor

1. Personnel issues-Action/decision-Action-Incorrect action performance-Pilot - C
2. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C
3. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
4. Personnel issues-Task performance-Maintenance-Repair-Pilot - F
5. Aircraft-Aircraft structures-Doors-Emergency exit-Incorrect service/maintenance - F
6. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Altitude-Not attained/maintained
7. Environmental issues-Physical environment-Object/animal/substance-Tree(s)-Contributed to outcome

## Narrative

During a winter flight, passengers reported that cold air was entering the airplane from the left side of the passenger cabin. Afterwards, the pilot examined the area and discovered that there was a small gap under the emergency exit window that was allowing air to enter the cabin from outside the airplane. He opened the window and examined the rubber seal which was intact. He could not tell though, if it was compressed or thinner than normal. He then closed and latched the window and inspected the latch with a flashlight to make sure it was latched. Since he was going to fly back to his home airport in similar winter conditions on the next flight, He took several rolled-up paper towels and placed them between the trim and the window to try and keep the cold air out, and placed a strip

of blue painters tape on the outside of the lower portion of the window to further reduce the entry of cold air. Since it was a beautiful day, he decided to fly the airplane once around the traffic pattern before fueling up for his return flight. After takeoff while on the downwind leg of the traffic pattern at 800 feet, he suddenly heard a "whoosh" behind his seat. Instead of landing, and then checking to see what happened, he instead checked for other traffic, turned on the autopilot, in heading and altitude mode, then reached around behind him to shut and latch the window which had opened 2 to 3 inches. Moments later, after turning back around to his normal seated position, he then heard a loud "pop" and turned around to find that the window had now opened completely. Since he was afraid it would come off the airplane and strike the tail, he reached back once again and pulled the window back down. The pilot advised that he must have "bumped" the autopilot off while he was doing this, since when he looked forward to check for traffic, he noticed that the airplane was approaching the ground. He then banked left and right to determine his location and spot any obstacles, raised the nose, and added power to climb. He then noticed that there were powerlines slightly higher than his altitude directly in front of him, and rather than risk a possible stall close to the ground by pulling back suddenly, he lowered the nose and "put" the airplane on the ground. At this point the airplane was approaching the edge of a field bordered by trees, so he pointed the nose of the airplane between trees. The airplane then struck the trees, and a fire ensued, resulting in substantial damage to the airframe. Examination of the emergency exit window by a Federal Aviation Administration inspector revealed that the paper towels the pilot inserted in the gap between the window and the airframe were interfering with the window's latching mechanism.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA497	08/19/2017 1615	Regis# N136BJ	Loman, ID	Apt: Warm Springs Creek 0U1
Acft Mk/Mdl BEECH A36-UNDESIGNAT		Acft SN E-1077	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: COMTEMPORARY COMMUNICATION SYSTEMS INC		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA15LA334 08/29/2015 830 EDT Regis# N2013G Dexter, ME Apt: Dexter Regional 1B0  
Acft Mk/Mdl BEECH B19 Acft SN MB-903 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl LYCOMING O-320 SERIES Acft TT 5168 Fatal 0 Ser Inj 1 Flt Conducted Under: FAR 091  
Opr Name: JOHN HALL Opr dba: Aircraft Fire: NONE  
AW Cert: STN

## Summary

The student pilot and flight instructor had flown for about 30 minutes before landing and conducting a subsequent takeoff. The instructor stated that, during the initial climb, the engine experienced a partial loss of power. He conducted a forced landing to a field during which the airplane impacted trees, resulting in substantial damage to the engine firewall, fuselage, and left wing. Examination of the engine revealed no evidence of any preimpact mechanical anomalies. The flight instructor calculated that the total distance required to clear a 50-ft obstacle during the takeoff was 1,300 ft; however, postaccident calculations based on performance data in the airplane's flight manual indicated a required takeoff distance of about 1,700 ft. Given that there were 30-ft-tall trees located 50 ft beyond the departure end of the 1,250-ft-long turf runway, it is likely that the airplane had insufficient distance available for takeoff and initial climb to clear the trees.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The flight instructor's inadequate preflight planning, which resulted in collision with trees and terrain during takeoff.

## Events

1. Initial climb - Loss of engine power (partial)
2. Landing - Off-field or emergency landing
3. Landing - Collision during takeoff/land

## Findings - Cause/Factor

1. Not determined-Not determined-(general)-(general)-Unknown/Not determined - C

## Narrative

On August 29, 2015, about 0830 eastern daylight time, a Beech B19, N2013G, was substantially damaged when it impacted trees and terrain near Dexter Regional Airport (1B0), Dexter, Maine. The flight instructor sustained serious injuries and the student pilot was not injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the local instructional flight, operating under the provisions of 14 Code of Federal Regulations Part 91. The flight was originating at the time of the accident.

According to the flight instructor, the airplane initially departed Old Town Airport (OLD), Old Town, Maine, around 0800. There, he and the student pilot had performed a preflight inspection together with no anomalies noted. The student pilot noted that there was about 43 gallons of fuel in the airplane and drained all three sump points with no evidence of water found in the fuel tanks. The engine oil level was at 6 quarts, which was within limits, as was the drop of engine rpm during the magneto check in the engine run-up.

After taking off from runway 22, the flight proceeded toward 1B0. After about 30 minutes, the airplane overflew the runway, fuel tanks were switched, and the airplane landed uneventfully on runway 34. After landing, the flaps were fully retracted and the carburetor heat was secured. The fuel boost pump remained on.

According to the flight instructor, "We had already calculated the ground roll and 50' clearance and found that we had the length necessary with reasonable margin for error based on temperature, and expected performance and were anticipating to be off the ground in no more than 700' and clear a 50' obstacle by around 1,300'." After taxiing to runway 25, the student pilot commenced the takeoff roll at the threshold with full power; oil pressure, fuel pressure, and temperature were "normal." In addition, the throttle, mixture, and carburetor heat were checked to be in their correct full forward positions.

According to the flight instructor, with the student pilot at the controls, the airplane lifted off the turf runway, about 600 ft down the runway. The climb was "normal" until about 50 or 60 ft above the runway, and just as the airplane was approaching the departure end the flight instructor noticed that the engine power "suddenly" dropped by 200 rpm, and that the airplane was no longer climbing. The flight instructor took the controls and saw a slight clearing ahead and to the left. He turned the airplane in a 10ø bank toward the clearing, and it started slowly sinking into a tree line.

Just before the airplane hit the first tree, the instructor extended the flaps in an attempt to clear it. The propeller was still turning as the instructor heard it cut through the 50-ft tree, although "it could have been wind-milling." The instructor believed the propeller then stopped spinning entirely, the airplane descended into a second tree, and tumbled to the ground.



According to the flight instructor, the airplane was manufactured in 1978. It was equipped with a Lycoming O-320 series, 150-hp, engine. The most recent annual inspection was performed July 21, 2015. According to a Federal Aviation Administration (FAA) inspector, the airframe had accumulated 5,168 total hours of operation at the time of the accident. According to the airplane's type certificate data sheet, its maximum gross weight was 2,150 pounds. The flight instructor reported that the airplane's weight at the time of the accident was 2,000 pounds.

The 0853 recorded weather observation at Bangor International Airport (BGR), Bangor, Maine, located about 22 nautical miles southeast of the accident location, included wind from 210ø at 3 knots, visibility 10 miles, overcast clouds at 25,000 ft agl, temperature 17øC, dew point 14øC, and an altimeter setting of 30.17 inches of mercury.

1B0 was located 3 miles east of Dexter, Maine, at an elevation of 533 feet msl. It had two runways designated as 16/34 and 7/25. Runway 16/34 was an asphalt runway, which was 3,008 ft-long by 75-ft-wide. Runway 7/25 was a turf runway, which was 1,250 ft long and 120 ft wide. There were 30 ft-tall trees located about 50 feet beyond the departure end of runway 25.

The airplane came to rest inverted about 400 feet from the departure end of runway 25. The firewall, left wing, and fuselage were substantially damaged. Fuel was noted draining from the wings. The propeller remained attached to the crankshaft. One propeller blade remained straight and the other blade was bent aft about 30ø. An examination of the engine by an FAA inspector revealed no obvious mechanical anomalies with the engine.

The carburetor icing probability chart from Federal Aviation Administration (FAA) Special Airworthiness Information Bulletin CE-09-35 Carburetor Icing Prevention, June 30, 2009, showed a probability of serious icing at glide power at the temperature and dew point reported at the time of the accident.

According to manufacturer published performance information, assuming a takeoff weight of 2,150 pounds, the total ground roll required to take off on a grass surface at sea level with calm wind and a temperature of 15øC was 1,105 ft, and the total distance required to clear a 50 ft obstacle was 1,710 ft. The total ground roll required to takeoff on a grass surface at sea level with calm wind at 25øC was 1,220 ft, and the total distance required to clear a 50 ft obstacle was 1,886 ft.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA16CA308	08/29/2016 1800 EDT	Regis# N9352S	Simsbury, CT	Apt: Simsbury 4B9
Acft Mk/Mdl BEECH C23-NO SERIES		Acft SN M-1653	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360-A4J		Acft TT 2165	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: ANDREW ROBINSON		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The student pilot reported that he was preparing for his private pilot check ride, and after about 90 minutes of flying, he approached the airport and entered the traffic pattern for runway 21, a 2,205-ft-long runway. The student pilot added that, while established on "short final," he chose to perform a go-around because he was not "comfortable" with the approach. On the second landing attempt, the airplane floated past the intended touchdown point before landing on the runway, and the student pilot was unable to stop the airplane before it went off the departure end. Subsequently, the airplane struck a perimeter fence and an embankment, which resulted in the nose landing gear collapsing and substantial damage to the fuselage and left wing. The student pilot reported no preimpact mechanical malfunctions or failures with the airplane that would have precluded normal operation. The winds reported at an airport 4 miles east of the accident location were from 320° at 7 knots.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The student pilot's failure to attain the proper touchdown point, which resulted in a runway overrun.

## Events

1. Landing - Landing area overshoot
2. Landing-landing roll - Runway excursion
3. Landing-landing roll - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Student/instructed pilot - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Student/instructed pilot - C
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Descent/approach/glide path-Not attained/maintained - C
4. Aircraft-Aircraft oper/perf/capability-Aircraft capability-Landing distance-Capability exceeded - C
5. Environmental issues-Physical environment-Object/animal/substance-Fence/fence post-Contributed to outcome

## Narrative

The student pilot reported that he was preparing for his private pilot check ride and after about 90 minutes of flying, he approached the airport and entered the traffic pattern for runway 21, a 2,205 ft-long runway. While established on "short final," he elected to perform a go-around because he was not "comfortable" with the approach. On the second landing attempt, the airplane floated past the intended touchdown point, before landing on the runway, and the student pilot was unable to stop the airplane before it went off the departure end. Subsequently, the airplane struck a perimeter fence and an embankment, which resulted in the nose landing gear collapsing and substantial damage to the fuselage and left wing. The student pilot reported no preimpact mechanical malfunctions or failures with the airplane that would have precluded normal operation. The winds reported at an airport 4 miles east of the accident location were from 320 degrees true at 7 knots.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# WPR16LA128	06/18/2016 815 MST	Regis# N9246S	Prescott, AZ	Apt: Ernest A Love Field PRC
Acft Mk/Mdl BEECH C23-NO SERIES		Acft SN M-1742	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360-A4K		Acft TT 3958	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: PARKER JOYCE A		Opr dba:		Aircraft Fire: NONE

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## Summary

The pilot/owner and the pilot-rated passenger were making a multiple-leg cross-country trip. The day before the accident on two legs of the trip, the airplane's engine had run rough and experienced a partial power loss; both instances occurred after reaching cruise flight altitude and leaning the engine's fuel/air mixture. Due to the engine anomaly, the pilots elected to divert the night before the accident rather than continuing to the final destination in night conditions. The pilot/owner then consulted her mechanic, who attributed the power loss to vapor lock as a result of the weather conditions and instructed her to lean the mixture during the next pre-takeoff engine run-up.

The next morning, the pilots performed a preflight inspection. The airplane was not fueled before departure, and both pilots stated that the fuel onboard was adequate for the flight; however, neither provided the specific fuel quantity contained in each tank. The pilots departed with the left fuel tank selected and established a cruise altitude of 10,500 ft; the pilot/owner stated that she "did not lean the mixture at all" during the flight. About 50 minutes from the destination, the pilots switched the fuel selector from the left fuel tank to the right tank. Nearing their destination airport, they initiated a cruise descent and retarded the throttle to 1,800 rpm; the engine subsequently experienced a total loss of power. They attempted to restore engine power by cycling the throttle and mixture control but were unable to restart the engine. They did not switch fuel tanks. After determining that the airplane would not reach the runway, the pilots performed a forced landing to desert terrain. The airplane subsequently impacted the ground hard and bounced before it came to rest in an area of sparse desert vegetation about 1/2 mile from the airport.

A postaccident examination revealed that the fuel system was intact and not damaged during the accident; the right tank was found void of fuel, and the left tank contained about 10 gallons. Examination of the fuel sensor system showed that both the left and right fuel gauges erroneously indicated fuel was available when the fuel transmitters were placed in the empty position. An engine test run revealed no anomalies.

Based on the information provided by the pilots, the airplane likely departed on the accident flight with about 30 total gallons of fuel. Although fuel computations using the pilots' flight plan indicated that the right fuel tank, which was selected at the time of the engine power loss, should have had about 8 gallons of usable fuel remaining, the tank was void of fuel at the accident site.

The fuel consumption figures provided in the pilot's operating handbook indicated that the airplane's fuel consumption during the flight would have ranged from about 8.7 gallons per hour (gph) to 10.2 gph depending on the engine power setting and with the fuel-air mixture leaned to maximum power then slightly enriched. Given that the fuel system was intact and that the right tank was completely void of fuel, the loss of power was likely the result of fuel starvation due to inflight fuel mismanagement.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilots' improper inflight fuel management, which resulted in a total loss of engine power due to fuel starvation.

## Events

1. Enroute-descent - Fuel starvation
2. Enroute-descent - Loss of engine power (total)
3. Emergency descent - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C
2. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid management - C

## Narrative

On June 18, 2016, about 0815 mountain standard time, a Beech C23 airplane, N9246S, was substantially damaged during a forced landing following a total loss of engine power near Prescott, Arizona. The private pilot/owner was not injured, and the pilot-rated passenger received minor injuries. The airplane was owned and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the cross-county flight, which departed Grants-Milan Municipal Airport (GNT), Grants, New Mexico about 0715 mountain daylight time. The personal flight was destined for Ernest A. Love Field Airport (PRC), Prescott, Arizona.

The pilots were participating in a point-to-point air race event. They departed Philip Billard Municipal Airport (TOP), Topeka, Kansas, the previous day at 0815 central time with about 52 gallons of fuel onboard. They reached a cruise altitude of 6,500 feet and flew for about 4 hours before they arrived at their second waypoint, Dalhart Municipal Airport (DHT), Dalhart, Texas. After they topped off the fuel tanks with 35.5 gallons of fuel, they departed for Tucumcari, New

Mexico (TCC). As they reached their cruise altitude of 8,500 ft, they leaned the mixture control and, moments later, the engine lost power. The pilot enriched the mixture and engaged the fuel boost pump and the engine "came back to life." Later in the flight, an Air Route Traffic Control Center controller informed the pilot of a temporary flight restriction (TFR) along their route of flight. After 2 hours and 20 minutes of flight, the pilots chose to land at an airport in Sandia, New Mexico to adjust their route of flight around the TFR. They subsequently departed to the east and flew an indirect route to Socorro Municipal Airport (ONM), Socorro, New Mexico. They refueled the airplane with 27 gallons of fuel and filled the left tank until it reached a fuel quantity of 26 gallons usable fuel. The right tank was filled to the tabs, which, according to the aircraft's flight manual, provided 15 gallons of usable fuel. During their subsequent flight to PRC, the destination airport, they leaned the mixture after they reached their cruise altitude, 8,500 ft, and the engine lost power again. The pilot enriched the mixture and engaged the fuel boost pump, and engine power was restored approximately 20 seconds later. As the evening approached, they decided to land at GNT and spend the night.

The following morning, the pilot/owner contacted her mechanic to discuss the engine problems they had encountered. The mechanic attributed the power loss to vapor lock as a result of the density altitude and hot temperature conditions, and suggested a higher run-up power setting and to lean the mixture for best power on the ground. They followed the mechanic's instructions by leaning the mixture out on the ground and subsequently departed with the fuel selector on the left fuel tank. According to the pilot's recount, they leaned the mixture knob out on the ground for "best power," but did not adjust it during the accident flight. About 1 hour and 10 minutes into the flight at a cruise altitude of 10,500 ft, the pilot determined they had about 49 minutes of flight time remaining. She then selected the right fuel tank, "believing at this point there was now more fuel in the right tank than the left." Within a few miles of their destination airport, the pilot/owner told the pilot-rated passenger seated in the right seat, who had assumed control of the airplane for the cruise portion of the flight, that they needed to initiate a descent. The pilot/owner reviewed the descent checklist and activated the fuel boost pump, ensured the fullest (right) fuel tank was selected, the landing gear was down, and the mixture was in the full rich position. After they retarded the throttle to approximately 1,800 rpm, the engine experienced a total loss of power. They advanced the throttle and cycled the mixture control, but did not receive a response from the engine. Seconds later, they observed a burst of engine power, so the pilot gradually leaned the mixture control, but the engine did not produce any further power. She subsequently attempted to restart the engine, but was unsuccessful. The pilot/owner notified the tower controller at PRC, who cleared them to land on runway 21L. They descended the airplane rapidly, but then determined they would not reach the runway due to the 30 degree turn that was required, so they proceeded to land straight ahead. The airplane impacted the ground hard at approximately 80 mph and bounced. The airplane then returned to the ground and stopped. According to the pilot-rated passenger, the main landing gear separated shortly after the airplane touched down, and the airplane skidded up the rising face of a small berm. An initial report from an airport operations representative indicated that the airplane came to rest in an area of sparse desert vegetation about 1/2 mile north of PRC. The pilot/owner subsequently reported that she did not attempt to switch fuel tanks after the loss of power. Photographs provided by an airport operations representative and the Federal Aviation Administration revealed substantial damage to the right aileron and the left wing.

A fuel performance computation was completed based on the flight plan information provided by the pilots. According to the pilot/owner's statement, they departed ONM with approximately 26 gallons of usable fuel in the left tank and 15 gallons of usable fuel in the right fuel tank, and completed a 1 hour flight to GNT at a cruise altitude of 8,500 ft with the fuel selector on the L tank. Based on these values, the engine would have consumed about 10.9 total gallons of fuel. Before they departed GNT, the pilot-rated passenger confirmed the presence of fuel in both fuel tanks. They subsequently departed GNT on a 2-hour flight with approximately 16.6 gallons of fuel in the left tank and 15 gallons of fuel in the right tank. Approximately 1 hour and 10 minutes into the flight, they switched the fuel selector from the left tank to the right tank. Given these calculations, at the time of the loss of power, the left tank should have contained about 9.7 gallons of usable fuel, and the right tank should have contained about 7.6 gallons of usable fuel.

According to a representative of the airport who arrived on scene about 1 minute after the fire department, both occupants stated to him that they had turned the fuel off before they exited the airplane. The representative did not detect a fuel odor at the site, nor did he observe any indication of a fuel leak during the time he was in proximity of the airplane. The airport representative did not observe any traces of fuel on the ground when the airplane was lifted on the flatbed truck during the recovery effort. A representative of the recovery team stated that 10 gallons of fuel were drained out of the left fuel tank, and the right fuel tank was void of fuel.

A fuel system inspection and engine test run was completed by a representative of the airplane manufacturer under the supervision of an NTSB investigator. During the inspection of the fuel system, the representative did not observe any breaches of the right or left fuel tanks. The fuel strainer, located between the fuel selector valve and the engine, was equipped with a quick drain at its base that had been sheared off during the accident sequence. According to a representative of the airframe manufacturer, placing the fuel selector valve in the OFF position prevents fuel in the tanks from moving to the fuel strainer. A bolt was installed in place of the quick drain to prevent fuel from draining out during the engine test run. Both fuel gauges indicated full fuel when the fuel transmitters were moved by hand to the full position, but showed  $\approx$  full when the fuel transmitters were placed in the empty position. The engine was subsequently test run with new fuel that was introduced from an external tank attached to the fuel system at the right wing root as both wings had been

removed during recovery of the aircraft. After the right fuel tank was selected, the engine was run to 2,200 rpm. The engine functioned normally during the magneto check and engine run up as the fuel flow indicator remained within the normal range. The engine did not show any power interruptions when the throttle was advanced rapidly. An engine backfire was heard once when the throttle was rapidly reduced from 2,200 rpm to 700 rpm; however, the engine continued to run. The engine test was repeated with fuel fed from the left side and no anomalies were observed.

During a follow-up interview, the pilot-rated passenger reported that she sumped and visually inspected the fuel tanks to verify the presence of fuel. According to her recount, she observed that the fuel quantities "were enough to take off." Although she did not normally use the fuel gauges to track the fuel quantities, the pilot/owner stated that with about 45 minutes of flight time remaining, she observed the left fuel gauge needle entering the yellow band, a slightly below half-full indication, and the right gauge needle in the yellow band, which she equated to about 9 gallons of fuel remaining in the right tank.

According to the pilot's operating handbook (POH), the yellow band of the fuel gauges represents a fuel quantity between empty and 3/8 full, approximately 9 gallons. The POH shows a fuel consumption of 8.7 gallons per hour (gph) at a power setting of 66% and 10.2 gph at a power setting of 75%; with the fuel-air mixture leaned to produce maximum rpm, then slightly enriched.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA500 08/21/2017 1440	Regis# N6576R	Rexburg, ID	Apt: Rexburg-madison County RXE
Acft Mk/Mdl BEECH C23-NO SERIES	Acft SN M-1594	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Opr Name: WASATCH MEADOWS FLYERS LLC	Opr dba:	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
			Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA301	08/03/2017 1130	Regis# N44562	Colorado Spring, CO	Apt: City Of Colorado Springs Muni COS
Acft Mk/Mdl BEECH D17S		Acft SN 6923	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl PRATT & WHITNEY R985-AN-6		Acft TT 3264	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CUTTER WILLIAM R		Opr dba:		Aircraft Fire: NONE

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## Events

3. Landing-landing roll - Loss of control on ground

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## Narrative

On August 3, 2017, about 1130 mountain daylight time, a Beech D17S airplane, N44562, ground looped during landing at City of Colorado Springs Municipal Airport (COS), Colorado Springs, Colorado. The pilot and one passenger were not injured and the airplane sustained substantial damage. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan had been filed. The flight departed Gallup Municipal Airport (GUP), Gallup, New Mexico, about 0900.

The pilot stated during landing the right quartering tailwind was 10 to 13 mph. He made a normal landing with a lot of left rudder application to keep the airplane straight. After touchdown, with the tailwheel on the runway, the airplane drifted to the right and he applied left brake. The right landing gear collapsed and the airplane continued to the right edge of the runway where it came to rest upright. The pilot stated there were no mechanical malfunctions with the airplane and that "it got away from me, I guess."

The responding Federal Aviation Administration (FAA) inspector reported that the airplane landed on runway 35L and ground looped during the landing roll. The right main landing gear collapsed (figure 1), the lower right wing struck the ground. A postaccident examination revealed no anomalies with the landing gear.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA282	07/23/2017 2200 CDT	Regis# N4216D	Wichita Falls, TX	Apt: Wichita Valley F14
Acft Mk/Mdl BEECH G35-NO SERIES		Acft SN D-4414	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL E-225-8			Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: KNOWLES AVIATION LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Landing-landing roll - Loss of control on ground

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## Narrative

On July 23, 2017, about 2000 central daylight time, a Beech G35, N4216D, was substantially damaged when it struck an irrigation canal off the end of runway 31 at Wichita Valley Airport (F14), Wichita Falls, Texas. Visual meteorological conditions prevailed at the time of the accident. The personal flight was being conducted under the provisions of Title 14 CFR Part 91 without a flight plan. The pilot, the sole occupant aboard, was seriously injured. The flight originated from Addison Airport (ADS) about 1945, and was destined for F14.

The airplane was found in a drainage ditch off the end of runway 31. The pilot was unable to extricate himself from the wreckage until the next morning. He was transported to a local hospital with serious injuries. Federal Aviation Administration inspectors reported the airplane sustained substantial damage to the forward fuselage and firewall.



# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA15FA308	08/12/2015 930 EDT	Regis# N390Z	Weirsdale, FL	Apt: Love's Landing 97FL
Acft Mk/Mdl BEECH N35		Acft SN D-6762	Acft Dmg: DESTROYED	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL MOTORS IO-470-N		Acft TT 6663	Fatal 2 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WOMACK DAUPHIN R		Opr dba:		Aircraft Fire: GRD
				AW Cert: SPS

## Events

1. Takeoff - Loss of engine power (partial)

## Narrative

### HISTORY OF FLIGHT

On August 12, 2015, about 0930 eastern daylight time, a Beech N35, N390Z, was destroyed when it impacted trees and terrain shortly after takeoff from Love's Landing (97FL), Weirsdale, Florida. The airline transport pilot and the pilot-rated passenger were fatally injured. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91. An instrument flight rules flight plan was filed for the personal flight from 97FL to Page Field (FMY), Fort Myers, Florida.

According to a witness, the airplane took off from runway 36. At the departure end of the runway, there was a crossing runway, designated 9/27. The witness, who was a pilot working outside his home located near the departure end of runway 36, reported that airplanes using runway 9/27 would typically stay low during takeoff, while those taking off from runway 36 would typically climb at a relatively high angle to avoid airplanes using the crossing runway.

The witness had seen the accident airplane take off many times on runway 36 and use a high climb angle, but, on the day of the accident, when he expected to see the airplane climb above houses about halfway along the runway, he was surprised when he did not see it. When he finally saw the airplane at a point about 300 to 400 ft before the departure end of the runway, it was about 50 ft in the air, with landing gear retracted, and about level with the eaves of the houses lining the runway. The witness then lost sight of the airplane and subsequently heard two loud "bangs."

The witness further noted that the airplane's engine sounded normal until takeoff, when it then started to "stall" as if a cylinder was "missing." He also noted that, when he saw the airplane, it appeared to be flying in ground effect and that it was in slow flight with a high angle of attack.

### PERSONNEL INFORMATION

The pilot, age 78, held an airline transport pilot certificate with airplane single-engine land and airplane multi-engine land ratings. He also held a flight instructor certificate with airplane single-engine, airplane multi-engine, and instrument airplane ratings, a ground instructor certificate, a flight engineer certificate, and a mechanic certificate (airframe and powerplant). He held a Federal Aviation Administration (FAA) third-class medical certificate with a restriction to wear corrective lenses.

A review of the pilot's personal logbook revealed that, as of the last recorded flight on August 9, 2015, he had logged about 10,545 hours, including 9,891 hours as pilot-in-command and 7,069 hours in single-engine airplanes. His most recent flight review was recorded on July 19, 2014.

### AIRCRAFT INFORMATION

The four-seat, low-wing, retractable landing gear airplane was manufactured in 1961. It was powered by a 260-horsepower Continental IO-470-N reciprocating engine, which drove a Hartzell two-bladed, constant-speed propeller.

According to the maintenance logbooks, the airplane's most recent annual inspection was completed on July 15, 2015. At that time, the airframe total time was 6,663 hours. Based on pilot logbook entries, at the time of the accident, the airplane had accumulated about 5.5 hours since the last annual inspection.

### METEOROLOGICAL INFORMATION

Leesburg International Airport (LEE), Leesburg, Florida, was located about 10 nm east-southeast of the accident site. The LEE 0853 weather observation included wind from 220° at 5 knots, visibility 10 statute miles, sky clear, temperature 28°C, dew point 24°C, and altimeter setting 30.01 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

The wreckage path began with broken tree branches about 40 ft up a tree, located about 355ø true, and about 1,000 ft from the airport fence at the north end of the runway. The path continued at a downward angle of about 20ø for about 130 ft to a ground impact mark containing the two-bladed propeller and spinner, which had separated from the engine crankshaft. One propeller blade exhibited "S" bending and blade twist signatures, and the other had relatively light twisting. Both blades exhibited leading edge burnishing and chordwise scratching.

About 10 ft beyond the propeller, the airplane was resting vertically against two trees, nose down, with the empennage bent over the fuselage. The right wing and the cabin area were consumed in a postcrash fire; there was no evidence of an inflight fire. The left wing and the right ruddervator exhibited tree impact marks.

All flight control surfaces were accounted for at the accident site, and control continuity was confirmed from the cockpit to the empennage and the wings.

The throttle and propeller controls were found full forward, and the mixture control was found pulled out about « inch as measured from the panel bulkhead. The fuel boost pump was found in the "ON" position. The pump switch did not appear to be impact-damaged and could be switched on and off without binding.

Engine crankshaft continuity was confirmed. Eleven of the 12 spark plugs were removed and examined. One plug was broken off in the cylinder and could not be removed. No anomalies were observed in the removed plugs. Five fuel injectors were examined and found to be internally clear of debris; one had molten metal around it and could not be removed.

The engine's throttle body metering unit was broken from its mount and was held onto the engine by fuel lines. The mixture control arm remained attached to the unit; however, when turned, it rotated on the shaft with no shaft movement. The throttle body metering unit was shipped to the manufacturer's facility for further examination.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Medical Examiner, District 5, Leesburg, Florida, performed autopsies of the pilot and pilot-rated passenger. The cause of death of the pilot was blunt force and thermal injuries, and the manner of death was accident. The cause of death of the pilot-rated passenger was multiple blunt force injuries, and the manner of death was accident.

The FAA's Bioaeronautical Research Sciences Laboratory, Oklahoma City, Oklahoma performed toxicology testing on specimens from the pilot and pilot-rated passenger.

Testing of the pilot identified 0.053 (ug/ml, ug/g) diphenhydramine in blood and diphenhydramine in urine. Ibuprofen was also detected in urine. Testing was negative for cyanide, ethanol, and major drugs of abuse, and 17% carbon monoxide was detected in blood.

Testing of the pilot-rated passenger identified cetirizine, quinine, and tolterodine in the liver and blood. Testing was negative for carbon monoxide, ethanol, and major drugs of abuse. Testing for cyanide was not performed.

## TESTS AND RESEARCH

The engine's throttle body metering unit was examined on April 5, 2017, at the Continental Motors facility at Mobile, Alabama. The unit displayed fire and impact damage; the fire damage appeared to be greater on the mixture side of the unit than on the throttle side of the unit. The mixture and throttle control lever arms were secured to their respective shafts by attachment nuts. The attachment nuts were removed, and the spline areas of both arms were inspected. The internal splines of both arms were stripped, and brass material from the bronze arms was transferred to the external splines of the steel shafts.

The throttle and mixture control arms were manufactured from bronze. According to the engine manufacturer, both lever arms should have been replaced with stainless steel arms per Continental Motors Category 2 Critical Service Bulletin (CSB) CSB08-3C, dated March 14, 2008. The CSB was issued after reports that bronze mixture and throttle control arms were inadequately torqued and became loose, which could lead to a loss of engine control or engine power. A

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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copy of the CSB is included in the public docket for this investigation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA15LA296	08/03/2015 1600 CDT	Regis# N4002G	Camden, AL	Apt: Forrested Clearing NONE
Acft Mk/Mdl BELL 47G 3B 1		Acft SN 6529	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl ALLISON 250-CID		Acft TT 13719	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: EWING FLYING SERVICE LLC		Opr dba:		Aircraft Fire: GRD
				AW Cert: STN

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## Summary

The airline transport pilot was repositioning the helicopter in preparation for spraying operations the next day. He reported that, about 1/2 mile from the intended off-airport landing area, while at an altitude of 300 ft above ground level, the helicopter's cyclic control became very stiff, consistent with a hydraulic system failure. He continued the approach to the landing zone, which was a cleared area of forest that contained brush, fallen trees, and dirt mounds. During the approach, he unsuccessfully attempted to follow the procedure to relieve hydraulic system control pressure, which included turning off the hydraulic system switch, but was unable to remove his hands from the controls and also maintain control of the helicopter. He ultimately elected to land without turning off the hydraulic system switch. During the landing, a portion of the helicopter's agricultural spray boom contacted the trees and brush, and the helicopter yawed to the left. The helicopter then began to oscillate as its skids contacted the uneven ground and obstructions before it ultimately rolled over, impacted the ground and caught fire. Fire damage to the engine and hydraulic system components precluded a postaccident examination, and its mode of failure could not be determined.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A failure of the helicopter's hydraulic flight control systems for reasons that could not be determined due to the fire damage, and the pilot's inability to turn off the hydraulic system to relieve control pressure.

## Events

1. Approach - Sys/Comp malf/fail (non-power)
2. Landing-flare/touchdown - Loss of control on ground
3. Landing-flare/touchdown - Dynamic rollover
4. Post-impact - Fire/smoke (post-impact)

## Findings - Cause/Factor

1. Aircraft-Aircraft systems-Hydraulic power system-Hydraulic, main system-Malfunction - C
2. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C
3. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C

## Narrative

On August 3, 2015, about 1600 central daylight time, a Bell 47G-3B-1, N4002G, operated by Ewing Flying Services LLC, was substantially damaged during a loss of control on landing near Camden, Alabama. Visual meteorological conditions prevailed, and no flight plan was filed for the flight which originated in Thomaston, Alabama and was destined for Oak Hill, Alabama. The helicopter was operated under the provisions of 14 Code of Federal Regulations Part 91 as a positioning flight.

The pilot was repositioning the helicopter for spraying operations scheduled to take place the following day. He has been airborne for approximately 20 minutes, and had used 10 gallons of fuel out of the 42 gallons he reported carrying. When he was at 300 feet altitude and about a half a mile out on approach to the off-airport landing zone, the hydraulic system augmenting the controls failed and the cyclic controls became stiff. He braced his left leg under the collective pitch control and grabbed the cyclic with his left hand, but he was unable to cycle the hydraulic system switch with his right hand because the collective control had drifted down, increasing his descent rate. The pilot responded by grabbing the collective and cyclic controls and left the hydraulic switch in the on position.

He continued the approach into the landing zone, which was a large clearing in a forest. Just prior to touchdown, the agricultural spray boom made contact with trees and brush, and yawed the helicopter to the left. During the touchdown, the heel of the left skid struck a dirt mound, rocking the helicopter forward. Subsequently the toe of the right skid struck the ground, the helicopter began to oscillate, and rolled to the left. The pilot attempted to correct, but the helicopter continued to rollover until it impacted the ground, coming to rest on the left side. After the impact, the pilot evacuated as fuel poured out of the right tank directly into the engine and cockpit area. The fuel ignited and the fire consumed the fuselage and caused significant damage to the transmission, engine and components. The hydraulic pump was extensively damaged by the fire and unable to be inspected.

According to the Federal Aviation Administration (FAA) airworthiness and maintenance records, the helicopter was equipped with a supplemental type certificate for the Soloy Allison 250-CID turbine engine conversion. In addition, the helicopter was equipped with an agricultural spray boom that was mounted

under the forward fuselage above the skid and aft of the skid toe. It was approximately 30 feet in length and extended about 12 feet from both sides of the cockpit. The helicopter's most recent 100 hour inspection was performed on February 19, 2015. At the time of the inspection, the airframe had accumulated 13,719.2 hours total time and the engine total time was 2,906.7 hours. Additionally, mast, bearing, hub and swashplate maintenance was performed on July 9, 2015 at 13,764.2 hours total time and engine total time of 2951.7.

According to FAA records, the pilot held commercial and airline transport pilot certificates, with ratings for airplane single engine land, airplane multi engine land, and rotorcraft helicopter. His last flight review was conducted on July 5, 2015 in the same make and model as the accident helicopter, and his most recent second-class medical was issued on May 14, 2015. He reported over 20,000 hours of total flight time, of which, 15,000 hours were in helicopters, and 1,080 in the same make and model as the accident helicopter.

An FAA inspector examined the helicopter at the accident site. According to the inspector, the fuselage, main rotor blades, and tail boom were substantially damaged during the accident sequence and fire consumed the fuselage and damaged the engine and components. The accident site was a forested clearing. The ground in the immediate vicinity was burned, but remnants under the helicopter and in the area around the accident site contained brush, 1-inch diameter branches and immature saplings. In addition, several larger diameter fallen pine trees were near the helicopter. A dirt mound approximately 14 to 18 inches tall and several feet long was 3 feet to the left of the helicopter near the main rotor head.

According to the Bell Helicopter Flight Manual Model 47, Section 2 Operating Procedures, "Hydraulic boost failure will be evident by feedback forces being transmitted to the cyclic stick when a control motion is made. Feedback forces may not be present or are negligible when the cyclic stick is held fixed or during autorotation. Feed-back forces encountered when moving the cyclic stick will be proportionate in intensity to an envelope of factors directly affected by airspeed, gross weight and climatic turbulence. When hydraulic boost power loss is detected, reduce cyclic control motions to the minimum required to complete the flight." It also stated, "If jamming of the controls or a condition of the controls tending to override the pilot is experienced, the HYD (hydraulic) SYSTEM switch, located on the instrument panel, should be immediately moved to OFF to relieve hydraulic pressure."

According to the FAA Helicopter Flying Handbook; FAA-H-8083-21A, under System Malfunctions & Hydraulic Failure, it states "If hydraulic power is not restored, make a shallow approach to a running or roll-on landing. This technique is used because it requires less control force and pilot workload."

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA282	08/18/2017 1809 EDT	Regis# N9176L	Fairhope, AL	Apt: H L Sonny Callahan CQF
Acft Mk/Mdl BELLANCA 7ACA-NO SERIES		Acft SN 35-72	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL MOTORS INC C85-12F			Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: SIRMON JAMES A		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Takeoff - Fuel related
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## Narrative

On August 18, 2017, at 1809 central daylight time, a Bellanca 7ACA airplane, N9176L, was substantially damaged during a forced landing, after it experienced a total loss of engine power shortly after takeoff from the H. L. Sonny Callahan Airport (CQF), Fairhope, Alabama. The private pilot sustained minor injuries and the pilot rated passenger was seriously injured. The airplane was registered to and operated by a private individual as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed and no flight plan was filed for the flight that originated at a private airstrip in Daphne, Alabama, about 1615.

The pilot stated that he had recently received a tailwheel endorsement in the accident airplane and the purpose of the flight was to practice takeoffs and landings. He said that even though he had the proper endorsement to fly the airplane alone, he asked the pilot rated passenger to come along with him as a precaution. The pilot stated that he had already completed several landings and had just taken off and started to turn onto the left crosswind leg of the traffic pattern about 500 ft above the ground (agl) when the engine stopped producing power. He immediately lowered the nose of the airplane, checked the position of the fuel selector, and applied carburetor heat. The engine started and the pilot began a climb; however, the engine quit running again, then re-started, and quit a third time. By this time, the pilot rated passenger had taken control of the airplane and subsequently made a forced landing to a corn field.

Postaccident examination of the airplane revealed no obvious mechanical deficiencies. The fuselage and both wing struts were substantially damaged. The engine was retained for further examination and a test-run.

The pilot held a private pilot certificate with an airplane single-engine land rating. His last Federal Aviation Administration (FAA) third-class medical certificate was issued on April 19, 2016. The pilot reported a total of 341.7 hours, of which, 3.3 hours were in the accident airplane.

The pilot rated passenger held an airline transport pilot certificate with ratings for multiengine land, single-engine land and single engine sea airplane. He also held a flight instructor certificate with ratings for single-engine land and multiengine land airplane. In addition, the passenger held numerous type ratings (CE-500, CE-525S, IA-Jet, and LR-60), and was an airframe and powerplant mechanic. His last FAA second-class medical certificate was issued on July 10, 2017. At that time, the passenger reported a total of 9,500 flight hours.

Weather conditions reported at CQF at 1815, included visibility 10 miles, clear skies and a west wind at 5 knots. The temperature was 82ø F and the dew point was 79ø F.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA357	06/20/2017 1700 MST	Regis# N88237	Edgewood, NM	Apt: Sandia Airpark Estates East 1N1
Acft Mk/Mdl BELLANCA 7GCBC-NO SERIES		Acft SN 744-74	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320		Acft TT 1390	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: KIRBY, DENNIS T.		Opr dba:		Aircraft Fire: NONE
				AW Cert: STA

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## Events

3. Landing-flare/touchdown - Hard landing

## Narrative

The pilot reported that, about 8 seconds into the takeoff roll in gusting wind conditions at high density altitude, the airplane "suddenly and expectantly lifted off the runway in a steep angle of attack." He added that, he immediately reduced power to idle to abort the initial climb, and the airplane "settled back onto the runway but landed hard." He further added that, during the landing roll, directional control was lost and the airplane veered off the runway, coming to rest in the dirt alongside the runway.

The fuselage, left wing, and aileron sustained substantial damage.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

An automated weather observation station, 10 nautical miles southeast of the accident airport, 5 minutes before the accident, reported the wind from 150ø at 16 knots, gusting 25 knots. The pilot reported that he observed the wind from 300ø at 8 knots, gusting to 15 knots. He reported that the takeoff was on runway 9. He further reported that the density altitude was 10,000 ft. at the departure airport.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA504 08/18/2017 1530 EDT Regis# N4859N Centerville, TN Apt: Centerville Muni GHM  
Acft Mk/Mdl BOEING E75-UNDESIGNAT Acft SN 75-5650 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: ERIC L. COLLINS Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA326	06/04/2017 900 EDT	Regis# N6511S	Newburyport, MA	Apt: Plum Island 2B2
Acft Mk/Mdl CESSNA 150-H		Acft SN 15067311	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL O-200-A		Acft TT 5498	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: TIMOTHY R. GILLETTE		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The solo student pilot reported that, during the takeoff roll, the pilot's side window blew open as full power was applied. He added that he "reached over with [his] right hand to close [the] window," but as he did so, the airplane veered off the runway to the left into a wooded area and impacted terrain. The student pilot reported that he had noticed on previous flights that the window latch was loose and that he had planned to get it fixed but had not done so.

Both wings sustained substantial damage.

The student pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The student pilot's decision to attempt to close the cockpit window during takeoff and his subsequent failure to maintain directional control.

## Events

1. Takeoff - Miscellaneous/other
2. Takeoff - Loss of control on ground
3. Takeoff - Runway excursion
4. Takeoff - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Student/instructed pilot - C
2. Personnel issues-Action/decision-Action-Incorrect action selection-Student/instructed pilot - C
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
4. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
5. Personnel issues-Task performance-Inspection-Preflight inspection-Student/instructed pilot

## Narrative

The solo student pilot reported that, during the takeoff roll the pilot's side window blew open as full power was applied. He added that he "reached over with [his] right hand to close [the] window," but as he did so, the airplane veered off the runway to the left into a wooded area and impacted terrain. The student pilot reported that he had noticed on previous flights that the window latch was loose, and he had planned to get it fixed, but had not done so.

Both wings sustained substantial damage.

The student pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA513	08/30/2017 1100	Regis# N2982U	Belle Fouche, SD	Apt: Belle Fourche Muni EFC
Acft Mk/Mdl CESSNA 172-G		Acft SN 17254808	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BELLE FOURCHE AERO LLC.		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA17LA293	08/21/2017 1430 CDT	Regis# N73929	Guntersville, AL	Apt: Guntersville Muni - Joe Starne 8A1
Acft Mk/Mdl CESSNA 172-N		Acft SN 17267753	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320 SERIES		Acft TT 8697	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: HENDERSON AVIATION		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

## Events

1. Takeoff - Loss of control on ground

## Narrative

On August 21, 2017, about 1430 central daylight time, a Cessna 172N, N73929, sustained substantial damage during takeoff from the Guntersville Municipal Airport (8A1), Guntersville, Alabama. The private pilot was not injured. The airplane was registered to a private corporation and operated by Henderson Aviation. Visual meteorological conditions prevailed for the flight that was being conducted as a 14 Code of Federal Regulations Part 91 flight. A visual flight rules flight plan was filed for the personal flight that was destined for the Tom B. David Airport (CZL), Calhoun, Georgia.

The pilot stated that he departed CZL earlier that day and flew direct to 8A1, where he planned to do a touch-and-go landing and then return to CZL. He stated that he made a normal landing on runway 07, but when the nose wheel touched down, the airplane began to shake. The shaking dissipated as the airplane slowed down. The pilot then raised the flaps, turned off the carburetor heat and applied full throttle to take off. As the airplane began to accelerate, it veered sharply to the left and departed the runway. The pilot was unable to stop the left turn even with full right rudder applied and the airplane traveled down a slope and into brush. The pilot called the operator of the airplane, who called the airport for assistance to have the airplane towed back on to the runway. The airplane was inspected by a mechanic, who determined that it was not "severely" damaged; thus, the pilot decided to fly the airplane back to CZL. The pilot elected to perform one touch-and-go landing at CZL before returning to 8A1. He said the takeoff and landing were normal, but when he powered up to takeoff, the airplane again veered left off the runway even with full right rudder applied. This time, the nose wheel struck an object and the left main gear was bent aft. The propeller struck the ground and the engine stopped.

The pilot held a private pilot certificate with a rating for airplane single-engine land. He reported a total flight experience of 119 hours, of which 16 hours were in the same make and model as the accident airplane. The pilot's last Federal Aviation Administration (FAA) third-class medical was issued on April 26, 2017.

The weather at Albertville Regional Airport (8A0), Albertville, Alabama, about 11 miles south of the accident site, at 1435, was reported as wind from 190ø at 3 knots, visibility 10 miles, clouds broken at 5,000 ft, temperature 31ø C, dewpoint 25ø C, and an altimeter setting of 30.15 inHG.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA180	02/17/2017 1150 EST	Regis# N737RT	Naples, FL	Apt: Naples Muni APF
Acft Mk/Mdl CESSNA 172-N		Acft SN 17269622	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320 H2AD		Acft TT 3836	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: SCA NAPLES LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Landing - Hard landing
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## Narrative

The pilot on the controls reported that during landing about 70 kts. airspeed, the airplane buffeted and was pushed to the right of the runway centerline. The pilot recovered and realigned the airplane with the nose on the centerline. When the pilot entered the flair, he reported that the airplane encountered another wind gust and the airplane ballooned. The airplane descended and pitched down and landed hard on the nose gear. The propeller struck the ground and the pilot landed the airplane without further incident. The airplane sustained substantial damage to the firewall.

The meteorological aerodrome report identified that the wind was variable at 05 kts. about the time of the accident.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA482    08/02/2017 1630 CDT    Regis# N91966    Kearney, NE    Apt: Kearney Rgnl EAR  
Acft Mk/Mdl CESSNA 172-R    Acft SN 17281616    Acft Dmg: SUBSTANTIAL    Rpt Status: Prelim    Prob Caus: Pending  
Fatal 0    Ser Inj 0    Flt Conducted Under: FAR 091  
Opr Name: BEERS INVESTMENT GROUP INC    Opr dba:    Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA122	01/12/2017 1230 EST	Regis# N10897	Punta Gorda, FL	Apt: Punta Gorda Airport PGD
Acft Mk/Mdl CESSNA 172-S		Acft SN 172S10606	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING IO-360-L2A		Acft TT 5148	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: PARAGON FLIGHT TRAINING CO		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The student pilot reported that, during his solo cross-country flight, he performed touch-and-go landings and takeoffs. The student pilot reported that there was a notice to airman identifying that the precision approach path indicator (PAPI) lighting was not in service at the second of three airports on his itinerary. The student pilot was cleared for a touch-and-go at the airport with no PAPI, and he reported that his landing was flat. He recalled that the airplane bounced but that he completed the touch-and-go and departed the airport for the final leg of his itinerary. He reported that he landed and shut down the airplane at his home airport, and "it was then that I noticed the bent prop tips. I immediately notified management." Further examination of the airplane by the operator revealed substantial damage to the firewall.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

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## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The student pilot's failure to maintain proper pitch control, which resulted in a hard, bounced landing.

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## Events

1. Landing-flare/touchdown - Hard landing

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## Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Pitch control-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Student/instructed pilot - C

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## Narrative

The student pilot reported that during his solo cross-country flight, he performed touch and go landings and takeoffs. The student pilot reported that there was a notice to airman identifying that the precision approach path indicator (PAPI) lighting was not in service at the second of three airports on his itinerary. The student pilot was cleared for a touch and go at the airport with no PAPI and he reported that his landing was flat. He recalled that the airplane bounced but he completed the touch and go, and departed the airport for the final leg of his itinerary. He landed and shut down the airplane at his home airport, and "it was then that I noticed the bent prop tips. I immediately notified management." Further inspection of the airplane by the operator revealed substantial damage to the firewall.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA351	06/10/2017 1100 CDT	Regis# N99HV	Lawrence, KS	Apt: Lawrence Muni LWC
Acft Mk/Mdl CESSNA 172-S		Acft SN 172S10090	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING IO-360-L2A		Acft TT 5814	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: HETRICK AIR SERVICES		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

5. Landing - Hard landing

## Narrative

The flight instructor reported that, during a simulated engine failure in the traffic pattern, with gusting wind conditions, the student pilot entered a forward slip on final approach. He added, that 10 to 20 ft. above the runway surface, "the wind gust we were riding suddenly halted wherein the aircraft began a rapid downward descent." The flight instructor reported that he "went for the flight controls to take command," but the student pilot at that same time applied back pressure on the flight controls. Subsequently, the airplane touched down hard, bounced back into the air, and the flight instructor performed a go-around. The flight instructor completed the subsequent traffic pattern and landing without further incident.

The engine mounts and firewall sustained substantial damage.

The flight instructor reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

An automated weather observation station at the accident airport, about the time of the accident, reported the wind from 170° at 16 knots, gusting to 24 knots. The flight instructor reported that the landing was on runway 15.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17FA272	08/11/2017 930 EDT	Regis# N1727V	New Milford, CT	Apt: Candlelight Farms 11N
Acft Mk/Mdl CESSNA 172M-M		Acft SN 17263727	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320 SERIES		Acft TT 8478	Fatal 1 Ser Inj 2	Flt Conducted Under: FAR 091
Opr Name: ARROW AVIATION LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Approach-VFR go-around - Loss of control in flight
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## Narrative

On August 11, 2017, about 0930 eastern daylight time, a Cessna 172M, N1727V, collided with terrain at Candlelight Farms Airport (11N), New Milford, Connecticut. The airplane was substantially damaged. The flight instructor was fatally injured. The student pilot and one passenger were seriously injured. The airplane was registered to and operated by Arrow Aviation LLC under the provisions of 14 Code of Federal Regulations part 91. Day, visual meteorological conditions prevailed, and no flight plan was filed for the local, instructional flight. The flight originated at Danbury Municipal Airport (DXR), Danbury, Connecticut about 0835.

The passenger, who was seated in the aft seat, walked to a nearby residence after the accident to seek assistance. There were no eyewitnesses. A local resident heard the airplane's engine prior to the accident; however, he did not see the airplane in flight.

The accident site was located on an open field, about 1,000 feet northwest of the airport boundary. The wreckage was found in an upright, nose low attitude. All structure and components of the airplane were accounted for at the accident site. The nose landing gear separated during the impact sequence. There was no fire. The airplane was equipped with a fuel tank in each wing, and both tanks contained fuel.

The student pilot, seated in the left cockpit seat, did not possess a Federal Aviation Administration (FAA) student pilot certificate or a FAA medical certificate. She was enrolled as a student at Arrow Aviation. According to her pilot logbook, she had logged about 15 hours total flight time.

The instructor pilot, seated in the right cockpit seat, held flight instructor and commercial pilot certificates with airplane single engine land, airplane multiengine land, and instrument airplane ratings. His most recent FAA second class medical certificate was issued on May 21, 2016. He did not report any flight time on his most recent medical certificate application; however, he reported 3,900 hours total time to the FAA in October 2012. His pilot logbooks have not been located.

The single-engine, high-wing, four-seat airplane was manufactured in 1975 and incorporated fixed, tricycle landing gear. It was equipped with a Lycoming O-320-E2D reciprocating engine rated at 160 horsepower. The airplane was equipped with electrically-operated wing flaps and a stall warning system. The cockpit featured dual flight controls.



# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA16FA141	03/26/2016 1208 EDT	Regis# N6238D	Charleston, WV	Apt: Yeager CRW
Acft Mk/Mdl CESSNA 172N-N		Acft SN 17272656	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320		Acft TT 10996	Fatal 1 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: BRENDA JACKSON		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The flight instructor, who was controlling the airplane, and the student pilot were conducting an instructional flight. During the takeoff the airplane lifted off about 1,000 ft down the runway, pitched nose up, and rolled left to an inverted attitude before it impacted terrain next to the runway in a nose-down attitude. The student pilot recalled that as the airplane rotated during the takeoff, he heard the flight instructor exclaim, but could not recall any subsequent events. Postaccident examination of the flight controls revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

Examination of the wreckage revealed witness marks along the flight instructor's seat tracks that corresponded with the seat in the nearly full-aft position. Given the flight instructor's stature, it is unlikely that this position would allow her to fully actuate the flight controls, and it is therefore unlikely she purposefully initiated the takeoff with her seat in this position. While one of the two locking pins that would have secured the seat from sliding fore and aft was found fractured, it is likely that the jockeying of the seat during the victim extraction process resulted in the fracture of the locking pin, and left the witness marks observed on the seat track. Examination of the wreckage and maintenance documents also revealed that the airplane was not equipped with a manufacturer-recommended secondary seat stop mechanisms for either of the pilot seats.

Review of operational and maintenance documents published by the airframe manufacturer showed the critical importance of ensuring that the pilot seats were secured prior to initiating a flight, and that accelerations such as those encountered during a takeoff could dislodge an unsecured seat. Had the flight instructor, who was performing the takeoff, not properly secured her seat prior to initiating the takeoff, it may have resulted in her seat sliding aft, and her inadvertent application of control inputs to the control yoke during the rotation and initial climb, consistent with steep climb, descent, and impact. The aft seat position could have also likely resulted in her inability to apply complete or sufficient control inputs to the rudder pedals, consistent with the left yaw/roll observed during the takeoff.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The flight instructor's failure to ensure that her seat was properly secured before initiating the takeoff, which resulted in a subsequent loss of control. Contributing was the lack of an installed secondary seat stop.

## Events

1. Takeoff - Miscellaneous/other
2. Takeoff - Loss of control in flight
3. Takeoff - Aerodynamic stall/spin
4. Uncontrolled descent - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Instructor/check pilot - C
2. Aircraft-Aircraft structures-Fuselage-Seat/cargo attach fitting-Incorrect use/operation - C
3. Aircraft-Aircraft structures-Fuselage-Seat/cargo attach fitting-Not installed/available - F

## Narrative

### HISTORY OF FLIGHT

On March 26, 2016, about 1208 eastern daylight time, a Cessna 172N, N6238D, impacted terrain during an attempted takeoff at Yeager Airport (CRW), Charleston, West Virginia. The flight instructor was fatally injured, and the student pilot was seriously injured. The airplane was registered to Skylane Aviation LLC and the flight was being conducted as a 14 Code of Federal Regulations Part 91 instructional flight. Visual meteorological conditions existed at the airport about the time of the accident, and no flight plan had been filed for the local flight.

The student pilot stated that the flight instructor let him taxi the airplane out from the fixed-base operator. The student was having difficulty with the brakes, so the instructor took over the controls and taxied the rest of the way to the runway and run-up area.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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The student pilot stated that he did not remember much after that. However, he did remember that air traffic control told them to expedite the takeoff because another aircraft was coming in for a landing and that the flight instructor then taxied out for takeoff. He recalled that as the airplane rotated during the takeoff, he heard the flight instructor exclaim, but could not recall any subsequent events.

Review of airport security surveillance video revealed that the airplane lifted off about 1,000 ft down runway 5, pitched up, rolled left, and then became inverted before it impacted terrain next to the runway in a nose-down attitude.

## PERSONNEL INFORMATION

### Flight Instructor

According to Federal Aviation Administration (FAA) records, the flight instructor held a commercial pilot certificate with airplane single-engine land, airplane multiengine land, and instrument airplane ratings. She also held a flight instructor certificate with airplane single-engine and instrument airplane ratings. She was issued an FAA second-class medical certificate on June 11, 2015. At the time of the medical examination, the flight instructor reported 1,694 total hours of flight experience. The flight instructor's personal flight logs were not located.

### Student Pilot

The student pilot held a student pilot/FAA third-class medical certificate, issued on March 9, 2016. The student's logbook had two entries indicating 3 total hours of flight experience.

## AIRCRAFT INFORMATION

The four-seat, high-wing, tricycle landing gear-equipped airplane was manufactured in 1979. It was powered by a 160-horsepower Lycoming O-320-H2AD engine and was equipped with a two-bladed McCauley propeller. Review of maintenance records revealed that the airplane's most recent annual inspection was completed on October 20, 2015. At that time, the airframe had accumulated 10,995.9 total hours of operation, and the engine had accumulated 1540.4 hours since major overhaul. The airplane had been operated about 7 hours since the last annual inspection was completed.

Examination of the airframe logbooks revealed that the seat tracks were replaced on February 12, 2015. Airworthiness Directive (AD) 2011-10-09 was accomplished about 8 months later during the most recent annual inspection. The AD required the inspection of the seat tracks, including but not limited to, the visual inspection of the holes in each track for excessive wear, the seat tracks for dirt or debris, and the seat locking pin for limited vertical play.

The pilot and copilot seats were mounted onto a set of seat tracks, which allowed the seats to slide fore and aft. An adjustment bar was used to raise and lower two locking pins into one of twelve positions along each of the seat tracks, which would secure the seat to the desired position. The locking pins downward travel and positive locking action was aided via a spring mechanism that tensioned the adjustment bar (see figure 1).

Figure 1. Illustrated Parts Catalog, Seat Diagram.

## WRECKAGE AND IMPACT INFORMATION

The wreckage was contained in a small area, and ground scars were consistent with the airplane impacting in a nose-low, right-wing-down attitude. The airplane impacted the ground about 20 yards left and midfield of runway 5 and came to rest inverted. The engine and propeller were forced up and into the instrument panel and cockpit area. The leading edges of both wings were crushed due to impact forces. The fuselage had one wrinkle in the skin behind the rear window. The rudder and elevator were intact and unremarkable. The flaps and aileron were intact and unremarkable. Control cable continuity was established to all flight controls. Measurement of the elevator trim jackscrew corresponded to an approximate neutral trim setting. When the engine crankshaft was rotated by hand, valve train continuity was established, and thumb compression was attained on all cylinders. The propeller exhibited rotational scoring, and one blade tip was missing.

All four roller housing tangs (feet) on the flight instructor's seat were spread and bent. The seat tracks were gouged where they were in contact with the locking pins. One locking pin was fractured off at the roll pin. There were lockpin contact marks in the eleventh hole location from the front to back of the inboard seat rail, consistent with the seat being near the full-aft position at impact.

The inboard seat-position locking pin and outboard seat-post from the flight instructor's seat were sent to the National Transportation Safety Board's Materials Laboratory for examination. The inboard seat position locking pin had fractured, and the overall deformation pattern adjacent to the fracture was consistent with bending deformation where the outboard side of the locking pin was in tension and the inboard side was in compression. The stop-pin hole below the fracture surface on the outboard side of the rod showed necking deformation, whereas the upper side of the hole remained close to its original diameter, consistent with the stop pin being in the upper side of the hole as the locking pin was bent. Contact marks were observed on the lower side of the stop-pin hole at the inboard end of the hole, consistent with contact along the roll pin split line on the compression side of the bending fracture.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Chief Medical Examiner, Charleston, West Virginia, performed an autopsy on the flight instructor. The cause of death was reported to be "multiple injuries." The report also noted that the flight instructor's height was 69 inches.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, conducted toxicology testing on specimens from the pilot. The results were negative for carbon monoxide and drugs.

## ADDITIONAL INFORMATION

The airplane's Pilot's Information Manual, before starting engine checklist, advised pilots to verify the seats, seat belts and shoulder harnesses are adjusted and locked.

The Cessna Pilot Safety and Warnings Supplements document warned that a pilot should perform a visual check to verify that their seat was securely on the seat tracks and assure that the seat was locked in position. Failure to ensure that the seat was locked in position could result in the seat sliding aft during a critical phase of flight, such as initial climb. The airframe manufacturer also issued a Service Bulletin (SEB07-R06 Revision 6, issued June 11, 2015), which required the installation of a secondary seat stop for the pilot seat, and recommended one for the co-pilot seat. A secondary seat stop was not installed on either of the accident airplane's front pilot seats. The supplement also warned that there had been previous reported events involving seats slipping rearward or forward during acceleration or deceleration related to discrepancies in the seat mechanisms. The investigations following these events revealed discrepancies such as gouged lockpin holes, bent lockpins, excessive clearance between seat rollers and tracks, and missing seat stops. Also, dust, dirt, and debris accumulations on the seat tracks and in the intermediate adjustment hoes have been found to contribute to the problem.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA250	07/19/2017 2027 EDT	Regis# N4876F	Factoryville, PA	Apt: Factoryville-seamans 9N3
Acft Mk/Mdl CESSNA 172N-N		Acft SN 17273094	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
		Acft TT 15424	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: ENDLESS MOUNTAINS AIR INC		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA163	03/01/2017 1119 EST	Regis# N22904	St Petersburg, FL	Apt: Albert Whitted SPG
Acft Mk/Mdl CESSNA 172S-S		Acft SN 172S9961	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING IO-360-L2A		Acft TT 4566	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: ST. PETE AIR		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

2. Landing-landing roll - Runway excursion

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## Narrative

The student pilot reported that during a solo flight he was performing takeoffs and full stop landings in the traffic pattern. During the landing roll, he configured the flaps to zero and applied full power. The airplane pulled to the left and he overcompensated the right rudder pedal application. "In an immediate reaction to reverse this I applied left rudder to quickly and went immediately to far left causing a fishtailing effect." The airplane exited the runway to the left and struck runway signage and a fence. The airplane sustained substantial damage to the left wing, the landing gear attachment points, the horizontal stabilizer and the elevator.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA505	08/21/2017	2004 PDT	Regis# N8053G	Byron, CA	Apt: Byron C83
Acft Mk/Mdl CESSNA 177RG-NO SERIES			Acft SN 177RG0053	Acft Dmg: UNK	Rpt Status: Prelim Prob Caus: Pending
				Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: TOBIN JEFFREY D			Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA245	07/04/2017 903 EDT	Regis# N9961N	Nashua, NH	Apt: Boire Field ASH
Acft Mk/Mdl CESSNA 180J-J		Acft SN 18052616	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
		Acft TT 1700	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: ERIK POTTS		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA508 08/22/2017 1500 CDT Regis# N2465G North Platte, NE Apt: North Platte Rgnl Airport Lee LBF  
Acft Mk/Mdl CESSNA 182-B Acft SN 51765 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: MUNSON DARREL L Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA089	01/14/2017 1035 EST	Regis# N707RB	Mobile, AL	Apt: Mobile Downtown BFM
Acft Mk/Mdl CESSNA 182-J		Acft SN 18257446	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONT MOTOR O-470 SERIES		Acft TT 6057	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: TERENCE WRAY		Opr dba:		Aircraft Fire: NONE
				AW Cert: SPE

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## Summary

According to the pilot, the single-engine airplane was equipped with a short takeoff and landing system, and before takeoff, he "lowered the full length flaperons to 30ø." The airplane climbed out at 70 mph, and as it reached an altitude of 75 ft above ground level, it encountered a crosswind gust from the right. The right wing pitched up, and the pilot attempted to recover the airplane by applying right aileron, followed by right rudder, and then lowering the nose; however, he could not stop the roll to the left. The airplane collided with the ground adjacent to the runway and sustained substantial damage to its airframe. The pilot reported that there were no preimpact mechanical failures or malfunctions with the airplane that would have precluded normal operation. The reported wind condition at the departure airport at the time of the accident was variable at 3 knots.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain airplane control during the initial climb.

## Events

1. Initial climb - Loss of control in flight
2. Uncontrolled descent - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Lateral/bank control-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

## Narrative

According to the pilot, the single-engine airplane was equipped with a short takeoff and landing system and before takeoff, he "lowered the full length flaperons to 30ø." The airplane climbed out at 70 mph, and as it reached an altitude of 75 ft above ground level, it encountered a crosswind gust from the right. The right wing pitched up and the pilot attempted to recover the airplane by applying right aileron, followed by right rudder, and then lowering the nose; however, he could not stop the roll to the left. The airplane collided with the ground adjacent to the runway, and sustained substantial damage to its airframe. The pilot reported that there were no preimpact mechanical failures or malfunctions with the airplane that would have precluded normal operation. The reported wind condition at the departure airport at the time of the accident, were winds variable at 3 knots.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA326	08/20/2017 1100 CDT	Regis# N182DW	Booneville, MO	Apt: Jesse Viertel Memorial Airport VER
Acft Mk/Mdl CESSNA 182-R		Acft SN R18200982	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING IO-540			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CLIFFORD JONES		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Landing-landing roll - Sys/Comp malf/fail (non-power)
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## Narrative

On August 20, 2017, about 1100 central daylight time, a Cessna 182R airplane, N182DW, was substantially damaged when it departed the runway while landing at the Jesse Viertel Memorial Airport (VER), Booneville, Missouri. The pilot and passenger were not injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and a Federal Aviation Administration (FAA) flight plan had been filed for the flight. The flight departed Clinton Regional Airport (CLK) Clinton, Oklahoma, and was en route to VER.

According to the pilot, while landing on runway 18 (4,000 ft by 75 ft, asphalt) the left brake locked and the airplane veered off of the runway and into a ravine. The horizontal stabilizer and fuselage were substantially damaged.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA492    08/12/2017 1330 CDT    Regis# N147DD    Quitman, MS    Apt: Clarke County 23M  
Acft Mk/Mdl CESSNA 182-T    Acft SN 18282367    Acft Dmg: SUBSTANTIAL    Rpt Status: Prelim    Prob Caus: Pending  
Fatal 0    Ser Inj 0    Flt Conducted Under: FAR 091  
Opr Name: JOHN M. CHANCELLOR    Opr dba:    Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# WPR15FA236	08/06/2015 2210 PDT	Regis# N5738F	Montecito, CA	Apt: N/a
Acft Mk/Mdl CESSNA 182F		Acft SN 18254796	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONT MOTOR O-470-R		Acft TT 6050	Fatal 2 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: PACIFIC COAST FLYERS		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The commercial pilot was conducting a cross-country business flight. While en route to the destination airport, the pilot reported to an air traffic controller that they were going to lose an engine. The flight was over mountainous terrain; the controller provided nearby airports to the pilot, and the pilot chose a diversionary airport. The pilot then reported that the airplane was experiencing vibrations and that he could not see anything due to oil on his windscreen, as well as smoke that had entered into the cabin. The controller told the pilot that he would report an emergency for him; no further communications were received from the pilot. The airplane was located the following morning in mountainous terrain.

The airplane struck a mountain at an elevation of 3,554 ft. On-site examination of the wreckage revealed that the airplane came to rest inverted with the undercarriage covered in oil from the nose to the tail. An examination of the airframe revealed no mechanical anomalies that would have precluded normal operation.

The engine teardown examination revealed a hole in the engine crankcase above the No. 6 connecting rod. The No. 5 connecting rod had fractured and separated from the crankshaft, which caused internal damage to the engine and led to the loss of engine power. The internal components exhibited signs of oil starvation; however, the cause of the oil starvation could not be determined.

Although a small amount of ethanol was detected in the pilot's cavity blood, no ethanol was detected in the vitreous or urine, indicating that the detected ethanol was likely due to postmortem production and did not contribute to the accident. Although the pilot's tissue samples tested positive for small amounts of the inactive metabolite of marijuana, no active drug was detected in the pilot's blood; therefore, the pilot was likely not experiencing significant effects from his marijuana use at the time of the accident.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: Oil starvation that led to the failure of the No. 5 connecting rod and a subsequent loss of engine power.

## Events

1. Enroute-cruise - Fire/smoke (non-impact)
2. Enroute-cruise - Powerplant sys/comp malf/fail
3. Enroute-cruise - Loss of engine power (partial)
4. Emergency descent - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Aircraft-Aircraft power plant-Power plant-(general)-Failure - C
2. Aircraft-Fluids/misc hardware-Fluids-Oil-Fluid level - C

## Narrative

### HISTORY OF FLIGHT

On August 6, 2015, about 2210 Pacific daylight time, a Cessna 182F airplane, N5738F, impacted mountainous terrain about 15 miles northeast of Montecito, California. The pilot and passenger were fatally injured, and the airplane sustained substantial damage. The airplane was registered to a private individual and operated by Pacific Coast Flyers as a 14 Code of Federal Regulations Part 91 cross-country business flight. Night visual meteorological conditions existed near the accident site about the time of the accident, and no flight plan had been filed. The flight had departed from the San Luis County Regional Airport, San Luis Obispo, California, at an undetermined time, and was destined for Mc Clellan-Palomar Airport, Carlsbad, California.

The pilot checked in with Point Mugu Approach Control at 2147:31. Less than 1 minute later, the pilot reported that there was a problem, and reported that he wasn't sure where they were going from here, and asked for directions. At 2148:26, the pilot reported that they were going to lose an engine, and then stated, "here something just happened." The controller and the pilot then discussed nearby diversionary airports, they chose Santa Barbara. At 2149:27, the pilot reported vibrations and that he couldn't see anything. He then reported an oil problem, "I think. we lost something." At 2150:21, the pilot reported that smoke was coming into the cabin; the controller told the pilot he was going to declare an emergency for him. No further communications were received from the pilot.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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after 2150:58. At 2151:34, the approach controller reported to the Los Angeles Air Route Traffic Control Center that the accident airplane had blown something, that the windshield was covered with oil, that there was smoke in the cockpit, and that the pilot was attempting to get to Santa Barbara.

The Ventura County Sheriff's Department located the airplane wreckage the next morning at 0430 in mountainous terrain.

## PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with a rotorcraft-helicopter rating, and private pilot privileges for airplane single- and multiengine land.

The pilot's personal flight records were not located. A review of the Federal Aviation Administration (FAA) airmen medical records revealed that the pilot was issued a time-limited, special issuance, second-class on March 7, 2015. On his medical certificate application, the pilot reported 6,250 total flight hours and 50 hours in the previous 6 months. The Aerospace Medical Certification Division withdrew the special issuance and issued a general denial on April 27, 2015, for alcohol dependence and failure to report a 2013 DUI. On July 29, 2015, the pilot requested a reconsideration because he had completed alcohol treatment and was in aftercare, but a decision was pending at the time of the accident.

## AIRCRAFT INFORMATION

The four-seat, high-wing, fixed-gear airplane, serial number 18254796, was manufactured in 1963. It was powered by a Continental Motors O-470-R 230-horsepower reciprocating engine.

The airplane was purchased by a private owner on November 22, 2014, and was leased to Pacific Coast Flyers as a rental airplane.

A review of the airplane's maintenance logbook revealed that an annual/100-hour inspection was completed on May 1, 2015, at which time the airframe total time was 6,050.25 hours, and the engine time since major overhaul was 250.4 hours.

The engine was overhauled by Corona Aircraft Engines, Corona, California; test run, and returned to service on September 10, 2009, as a zero hours-SMOH engine. The engine was installed on the accident airplane on September 18, 2009, at an airframe total time of 5,529.85 hours.

A March 18, 2011, Blackstone Laboratories oil sample report noted that there was an excessive amount of metal in an oil sample; that had been submitted for testing, and suggested a thorough inspection of the engine before operating the airplane. An April 29, 2013, oil sample report noted that there was some improvement, but that an excessive amount of metal was still present in the oil sample, and that "this engine could have some serious issues in the works." The report suggested that the operator look for cylinder issues and/or exhaust valve guide problems, change the oil every 30 hours, and proceed with caution.

A December 9, 2013, Blackstone Laboratories oil sample report indicated that the amount of wear metals in the sample were "coming down" from previous samples, but recommended that the operator try a shorter oil run to wash out the excess metals and then resample the oil in about 30 hours. An April 15, 2014, oil sample report showed that the amount of wear metals in the oil sample were much lower, and that the improvements were promising. The laboratory suggested using another shorter oil run, and submitting another sample. A February 19, 2015, oil sample report stated that the oil sample was better than past samples, and that the wear metals were in the average range. There was no contamination identified at this time; engine total time was 486 hours since major overhaul.

## METEOROLOGICAL INFORMATION

The nearest weather reporting station from the accident site was located 23 nautical miles southwest of the accident site at the Santa Barbara Municipal airport (SBA), Santa Barbara, California.

At 2153, the weather was reported as clear sky, visibility 10 statute miles. The temperature was 21 degrees C, dew point was 17 degrees C. The wind was from 100 degrees at 6 knots. The altimeter setting was 29.83 Hg.

The end of civil twilight occurred at 2023.

## WRECKAGE AND IMPACT INFORMATION

The airplane impacted a mountain at an elevation of 3,554 ft. The airplane came to rest inverted on a near-vertical slope about 300 feet below the top of the

ridgeline; the airplane came to rest about 50 ft below the impact point. The airframe examination revealed no mechanical anomalies that would have precluded normal operation.

Oil was observed on the airplane's undercarriage from the nose to the tail cone. A visual examination of the engine revealed a hole in the top of the engine case near the No. 6 cylinder. The engine was shipped to the manufacturer for further examination.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Santa Barbara County Sheriff-Coroner, Coroner's Bureau, conducted an autopsy on the pilot. The cause of death was reported as "multiple traumatic injuries."

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from the pilot. The testing detected 0.0431 and 0.002 (ug/ml, ug/g) tetrahydrocannabinol carboxylic acid, the inactive metabolite of marijuana in the liver and cavity blood respectively; no tetrahydrocannabinol (marijuana) was detected in the cavity blood.

No ethanol was detected in the urine or vitreous; 67 (mg/dL, mg/hg) ethanol was detected in cavity blood.

## TEST AND RESEARCH

An engine teardown examination was performed, and it revealed that the No. 5 connecting rod had fractured and separated from the crankshaft, which caused internal damage to the engine. The engine's internal components exhibited signs of oil starvation. Residual oil was found in the top and front of the engine crankcase.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC16LA038 07/03/2016 1753 AKD Regis# N6251K Halibut Cove, AK Apt: Homer HOM  
Acraft Mk/Mdl CESSNA 206 Acft SN T20608832 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl LYCOMING TIO-540-AJ1A Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: ALICE ROGOFF Opr dba: Aircraft Fire: NONE  
AW Cert: STN

## Summary

The private pilot was landing an amphibious airplane in the ocean waters of an inland cove. Photographs of the accident sequence showed the water conditions as relatively calm and glassy. The pilot reported that the airplane touched down faster than anticipated and before her intended touchdown point, which subsequently caused the airplane to bounce back into the air. Instead of continuing the landing, she attempted a go-around. As the airplane climbed in a nose-high attitude, she was unable to see over the nose of the airplane and collided with a stand of tall spruce trees. Witnesses stated that after impact, the airplane descended into the water, resulting in substantial damage to the wings and fuselage. The pilot reported there were no preaccident mechanical malfunctions that would have precluded normal operation.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain clearance from trees during an attempted go-around.

## Events

1. Landing-aborted after touchdown - Abnormal runway contact
2. Landing-aborted after touchdown - Collision during takeoff/land

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Environmental issues-Physical environment-Object/animal/substance-Tree(s)-Ability to respond/compensate - C

## Narrative

On July 3, 2016, about 1753 Alaska daylight time, an amphibious float-equipped Cessna 206 airplane, N6251K, sustained substantial damage after impacting trees and the tidal ocean waters of Halibut Cove, Alaska, about 11 miles southeast of Homer, Alaska. The private pilot, the sole occupant on board, sustained no injuries. The airplane was registered to Umailik LLC, Anchorage, Alaska and operated by the pilot as a 14 Code of Federal Regulations Part 91 visual flight rules personal cross-country flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The airplane departed the Homer Airport (HOM) about 1742 destined for Halibut Cove.

A witness described watching the float-equipped airplane as it approached the inland waters of Halibut Cove, and just after the floats contacted the surface of the water, the airplane immediately became airborne again, and it began to climb. When the airplane reached an altitude of about 40 feet above the water, it started a steep left turn and continued climbing until it struck a stand of tall trees. Following the impact, the airplane descended into the waters of Halibut Cove, where good Samaritans came to the aid of the pilot.

An additional witness who was on a tour vessel operating in Halibut Cove at the time of the accident stated that, as the airplane flew towards their tour boat, the airplane subsequently made a slight turn towards the vessel before passing off the right side and impacting trees. The airplane then descended into the water, about 100 feet from the tour boat.

Several photographs were captured by witnesses on the tour vessel and provided to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC). The first two photographs show the airplane about 20 feet above glassy water conditions, in a wings level, flaps extended configuration. The next two photographs show the airplane in a climbing left turn, with a slight water spray trailing from the keel of the left float, followed by a wings level, slightly nose high climb. The airplane's wing flaps remain extended. The last photograph in the sequence shows the airplane impacting a stand of tall spruce tree, which severed the floats, and damaged the left wing's leading edge. At the time of impact with the stand of trees, the airplane's wing flaps appear to be retracted. (An array of accident sequence photos are provided in the NTSB public docket for this accident)

In the pilot's written statement to the NTSB, she reported that during the accident landing, she inadvertently touched down faster than anticipated, and prior to her expected touchdown point, which caused the airplane to bounce. She wrote that instead of trying to salvage the landing, she attempted a go-around. Due to a high nose up attitude during the climb-out, she was unable to see in front of the airplane and subsequently impacted a tree.

The pilot stated there were no mechanical failures that would have precluded normal operation.

According to the NTSB form 6120.1 submitted by the pilot, her last biennial flight review was completed September 15, 2013, in the same make and model as the accident airplane.

The closest weather reporting facility was HOM, about 11 miles northwest of the accident site. At 1753, a HOM METAR reported in part, wind from 260ø at 9 knots, gusting to 14 knots; sky condition, broken clouds at 2,600 ft; visibility, 10 statute miles; temperature 61øF, dewpoint 48øF; altimeter setting 29.92 inches of mercury.



# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC16LA032 06/17/2016 1200 AKD Regis# N91170 Goodnews Bay, AK Apt: Goodnews GNU  
Acraft Mk/Mdl CESSNA 207 Acft SN 20700101 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl CONT MOTOR IO 520 SERIES Acft TT 15089 Fatal 0 Ser Inj 1 Flt Conducted Under: FAR 091  
Opr Name: RENFROS ALASKAN ADVENTURES INC Opr dba: Aircraft Fire: NONE  
AW Cert: STN

## Summary

During cruise flight through an area of mountainous terrain, the commercial pilot became geographically disoriented and selected the incorrect route through the mountains. Upon realizing it was the incorrect route, he initiated a steep climb while executing a 180° turn. During the steep climbing turn, the airplane inadvertently entered instrument meteorological conditions, and the airplane subsequently impacted an area of rocky, rising terrain. The pilot reported there were no mechanical malfunctions or anomalies that would have precluded normal operation of the airplane.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to select the correct route through the mountains as a result of geographic disorientation, and his subsequent visual flight into instrument meteorological conditions, which resulted in collision with terrain.

## Events

1. Enroute - VFR encounter with IMC
2. Enroute - Controlled flight into terr/obj (CFIT)

## Findings - Cause/Factor

1. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C
2. Environmental issues-Physical environment-Terrain-Mountainous/hilly terrain-Ability to respond/compensate - C
3. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Clouds-Decision related to condition - C

## Narrative

On June 17, 2016, about 1200 Alaska daylight time, a Cessna 207 airplane, N91170, sustained substantial damage after impacting steep, rising terrain about 8 miles northwest of the Goodnews Airport, Goodnews Bay, Alaska. The airplane was registered to DIO Air, LLC, and operated by Renfro's Alaskan Adventures, Inc., Bethel, Alaska, as a visual flight rules (VFR) repositioning flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The commercial pilot, the sole occupant, sustained serious injuries. Instrument meteorological conditions (IMC) prevailed at the accident location, and company flight following procedures were in effect. The flight departed about 1020 from the Quinhagak Airport (AQH), Quinhagak, Alaska, destined for Goodnews Airport (GNU).

During an interview with the National Transportation Safety Board (NTSB) investigator-in-charge on June 19, in Anchorage, Alaska, the pilot stated that after departing AQH, and as the flight progressed into an area of mountainous terrain, low clouds inhibited his ability to distinguish the correct route through the mountains from the incorrect route. When he discovered he had chosen the incorrect route, he was in an area that was too narrow and steep to safely turn around. In an effort to reduce his turning radius and avoid the rising terrain ahead, he initiated a steep climb while turning the airplane 180 degrees. During the steep climbing turn, the airplane entered IMC, and the airplane subsequently impacted an area of rock-covered rising terrain. He estimated the cloud ceilings to be about 800 feet mean sea level (msl) and his cruise altitude was about 700 feet msl before initiating the climbing turn.

The closest weather reporting facility is Platinum Airport, about 14 southwest of the accident site. At 1156, an aviation routine weather report (METAR) from the Platinum Airport was reporting in part: wind from 210 degrees at 12 knots; visibility 10 statute miles; temperature 48 degrees F, dewpoint 45 degrees F; altimeter 29.85 inHg.

The pilot reported no mechanical malfunctions or anomalies that would have precluded normal operation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# CEN15FA190	04/07/2015 6 CDT	Regis# N789UP	Bloomington, IL	Apt: Central Illinois Regional BMI
Acft Mk/Mdl CESSNA 414A		Acft SN 414A0495	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL MOTORS TSIO-520-NB		Acft TT 8390	Fatal 7 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: MAKE IT HAPPEN AVIATION, LLC		Opr dba:		Aircraft Fire: GRD
				AW Cert: STN

## Summary

The twin-engine airplane, flown by an airline transport pilot, was approaching the destination airport after a cross-country flight in night instrument meteorological conditions. The destination airport weather conditions about 1 minute before the accident included an overcast ceiling at 200 ft and 1/2-mile visibility with light rain and fog. According to air traffic control (ATC) data, the flight received radar vectors to the final approach course for an instrument landing system (ILS) approach to runway 20. As shown by a postaccident simulation study based on radar data and data recovered from the airplane's electronic horizontal situation indicator (EHSI), the airplane's flight path did not properly intercept and track either the localizer or the glideslope during the instrument approach. The airplane crossed the final approach fix about 360 ft below the glideslope and then maintained a descent profile below the glideslope until it leveled briefly near the minimum descent altitude, likely for a localizer-only instrument approach. However, the lateral flight path from the final approach fix inbound was one or more dots to the right of the localizer centerline until the airplane was about 1 nautical mile from the runway 20 threshold when it turned 90° left to an east course. The turn was initiated before the airplane had reached the missed approach point; additionally, the left turn was not in accordance with the published missed approach instructions, which specified a climb on runway heading before making a right turn to a 270° magnetic heading. The airplane made a series of pitch excursions as it flew away from the localizer. The simulation study determined that dual engine power was required to match the recorded flight trajectory and ground speeds, which indicated that both engines were operating throughout the approach. The simulation results also indicated that, based on calculated angle of attack and lift coefficient data, the airplane likely encountered an aerodynamic stall during its course deviation to the east. The airplane impacted the ground about 2.2 miles east-northeast of the runway 20 threshold and about 1.75 miles east of the localizer centerline.

According to FAA documentation, at the time of the accident, all components of the airport's ILS were functional, with no recorded errors, and the localizer was radiating a front-course to the correct runway. Additionally, a postaccident flight check found no anomalies with the instrument approach.

An onsite examination established that the airplane impacted the ground upright and in a nose-low attitude, and the lack of an appreciable debris path was consistent with an aerodynamic stall/spin. Wreckage examinations did not reveal any anomalies with the airplane's flight control systems, engines, or propellers. The glideslope antenna was found disconnected from its associated cable circuit. Laboratory examination and testing determined that the glideslope antenna cable was likely inadequately connected/secured during the flight, which resulted in an unusable glideslope signal to the cockpit avionics. There was no history of recent maintenance on the glideslope antenna, and the reason for the inadequate connection could not be determined.

Data downloaded from the airplane's EHSI established that the device was in the ILS mode during the instrument approach phase and that it had achieved a valid localizer state on both navigation channels; however, the device never achieved a valid glideslope state on either channel during the flight. Further, a replay of the recorded EHSI data confirmed that, during the approach, the device displayed a large "X" through the glideslope scale and did not display a deviation pointer, both of which were indications of an invalid glideslope state.

There was no evidence of cumulative sleep loss, acute sleep loss, or medical conditions that indicated poor sleep quality for the pilot. However, the accident occurred more than 2 hours after the pilot routinely went to sleep, which suggests that the pilot's circadian system would not have been promoting alertness during the flight. Further, at the time of the accident, the pilot likely had been awake for 18 hours. Thus, the time at which the accident occurred and the extended hours of continuous wakefulness likely led to the development of fatigue.

The presence of low cloud ceilings and the lack of glideslope guidance would have been stresses to the pilot during a critical phase of flight. This would have increased the pilot's workload and situational stress as he flew the localizer approach, a procedure that he likely did not anticipate or plan to conduct. In addition, weight and balance calculations indicated that the airplane's center of gravity (CG) was aft of the allowable limit, and the series of pitch excursions that began shortly after the airplane turned left and flew away from the localizer suggests that the pilot had difficulty controlling airplane pitch. This difficulty was likely due to the adverse handling characteristics associated with the aft CG. These adverse handling characteristics would have further increased the pilot's workload and provided another distraction from maintaining control of the airplane. Therefore, it is likely that the higher workload caused by the pilot's attempt to fly an unanticipated localizer approach at night in low ceilings and his difficulty maintaining pitch control of the airplane with an aft CG contributed to his degraded task performance in the minutes preceding the accident.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain

## Events

1. Approach-IFR initial approach - Nav system malfunction/failure
2. Approach-IFR missed approach - Loss of control in flight
3. Approach-IFR missed approach - Aerodynamic stall/spin

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Pitch control-Not attained/maintained - C
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Angle of attack-Not attained/maintained - C
4. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Below VFR minima-Effect on operation - C
5. Environmental issues-Conditions/weather/phenomena-Light condition-Dark-Effect on operation - C
6. Aircraft-Aircraft systems-Navigation system-Glide slope system-Inoperative - F
7. Personnel issues-Physical-Alertness/Fatigue-Circadian rhythms or jetlag-Pilot - F
8. Personnel issues-Psychological-Attention/monitoring-Task monitoring/vigilance-Pilot - F
9. Personnel issues-Psychological-Cognitive limitation-Cognitive overload-Pilot - F
10. Aircraft-Aircraft oper/perf/capability-Aircraft capability-CG/weight distribution-Capability exceeded - F

## Narrative

### HISTORY OF FLIGHT

On April 7, 2015, about 0006 central daylight time, a Cessna 414A twin-engine airplane, N789UP, collided with terrain following a loss of control during an instrument approach to Central Illinois Regional Airport (BMI), Bloomington, Illinois. The airline transport pilot and six passengers were fatally injured, and the airplane was substantially damaged. The airplane was registered to Make It Happen Aviation, LLC, and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 on an instrument flight rules (IFR) flight plan. Night instrument meteorological conditions (IMC) prevailed for the cross-country flight that departed Indianapolis International Airport (IND), Indianapolis, Indiana, at 2307.

According to Federal Aviation Administration (FAA) air traffic control (ATC) data, after departure, the flight climbed to a cruise altitude of 8,000 ft mean sea level (msl) and proceeded direct to BMI. At 2344:38, the flight was about 42 nautical miles (nm) south-southeast of BMI and entered a cruise descent to 4,000 ft msl. At 2352:06, the pilot established contact with a controller at the Peoria Terminal Radar Approach Control facility, reported being level at 4,000 ft msl, and requested the instrument landing system (ILS) runway 20 instrument approach to BMI. According to radar data, at the time of the request, the flight was located about 21 nm south-southeast of BMI and was established on a direct course to BMI at 4,000 ft msl. The controller told the pilot to expect radar vectors for the ILS runway 20 approach. At 2354:18, the controller told the pilot to make a right turn to a 330° heading. The pilot acknowledged the heading change. At 2359:16, the controller cleared the flight to descend to and maintain 2,500 ft msl. At 2359:20, the pilot acknowledged the descent clearance.

At 0000:01, the controller told the pilot to turn left to a 290° heading, and the pilot acknowledged the heading change. At 0000:39, the controller told the pilot that the flight was 5 nm from EGROW, the final approach fix, cleared the flight for the ILS runway 20 approach, issued a heading change to 230° to intercept the final approach course, and told the pilot to maintain 2,500 ft msl until established on the inbound course. The pilot correctly read back the instrument approach clearance, the heading to intercept the localizer, and the altitude restriction.

At 0001:26, the flight crossed through the final approach course while on the assigned 230° heading before turning to a south heading. The plotted radar data showed the flight made course corrections on both sides of the localizer centerline as it proceeded inbound toward EGROW. At 0001:47, the controller told the pilot to cancel his IFR flight plan on the approach control radio frequency, said that radar services were terminated, and authorized a change to the airport's common traffic advisory frequency (CTAF). At that time, the flight was 3.4 nm outside of EGROW and established inbound on the localizer, at 2,400 ft msl. At 0002:00, the pilot transmitted over the unmonitored airport CTAF, "twin Cessna seven eight nine uniform pop is coming up on EGROW, ILS runway 20, full stop." No additional transmissions from the pilot were recorded on the airport CTAF or by Peoria Approach Control.

At 0003:12, the flight crossed EGROW at 2,100 ft msl, continued to descend, and was right of the localizer centerline. At 0003:46, the flight was about 3.5 nm north of the runway 20 threshold when it descended below available radar coverage at 1,500 ft msl. Subsequently, at 0004:34, radar coverage was reestablished with the flight about 1.7 nm north of the runway 20 threshold at 1,400 ft msl. The plotted radar data showed that, between 0004:34 and 0005:08, the flight climbed from 1,400 ft msl to 2,000 ft msl while maintaining a south course. At 0005:08, the flight began a descending left turn to an east course. The airplane continued to descend on the east course until reaching 1,500 ft msl at 0005:27. The airplane then began a climb while maintaining an east course. At 0005:42, the airplane was 0.75 nm east of the localizer centerline at 2,000 ft msl. At 0005:47, the flight descended below available radar coverage at 1,800 ft

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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msl. Subsequently, at 0006:11, radar coverage was reestablished at 1,600 ft msl about 0.7 nm southeast of the previous radar return. The next two radar returns, recorded at 0006:16 and 0006:20, were at 1,900 ft msl and were consistent with the airplane on an east course. The final radar return was recorded at 0006:25 at 1,600 ft msl about 2.2 nm east-northeast of the runway 20 threshold and was coincident with the accident site location.

Numerous individuals reported being awoken shortly after midnight by the sound of a low-flying airplane over their respective residences. Additionally, several of these witnesses saw dense fog and/or rain after the airplane had overflowed their positions.

## PERSONNEL INFORMATION

According to FAA records, the 51-year-old pilot held an airline transport pilot certificate with single-engine land, multi-engine land, and instrument airplane ratings. The single-engine land rating was limited to commercial privileges. The pilot was type-rated for the Cessna Citation, Learjet 35, Rockwell Sabreliner, Dassault Falcon 10, and Embraer Phenom business jets. He also held a flight instructor certificate with single-engine, multi-engine, and instrument airplane ratings. His most recent FAA second-class medical certificate was issued on February 2, 2015, with a limitation for corrective lenses. On the application for his current medical certificate, the pilot reported having accumulated 12,000 hours of total flight experience, of which 500 hours were flown within the previous 6 months. A search of FAA records showed no previous accidents, incidents, or enforcement proceedings.

A current pilot logbook was not located during the investigation; the pilot's most recent logbook entry was dated February 15, 2005. A portfolio was found in the airplane wreckage that contained numerous pilot training certificates, fleet management documents, and airplane insurance applications. According to an insurance application that was submitted for the operation of the airplane, dated May 12, 2014, the pilot reported having a total flight experience of 12,100 hours with 9,850 hours in multiengine airplanes, 8,575 hours in turbine-powered airplanes, and 1,150 hours in Cessna 414A airplanes. The portfolio also contained documentation for simulator-based proficiency training in the Cessna 414A that was completed on August 14, 2013, at Recurrent Training Center, Inc., Savoy, Illinois. According to available information, the pilot's last flight review and instrument proficiency check were completed on March 11, 2015, in conjunction with simulator-based recurrent training for a Dassault Falcon 10 business jet at FlightSafety International, Dallas, Texas.

## AIRCRAFT INFORMATION

The airplane was a 1980 Cessna 414A (Chancellor), serial number 414A0495. Two turbo-charged Continental TSIO-520-NB reciprocating engines provided thrust through constant-speed, full-feathering, three-blade, Hartzell PHC-C3YF-2UF/FC7663DB-2Q propellers. The low-wing airplane was of conventional aluminum construction, was equipped with a retractable tricycle landing gear, and had a pressurized cabin that was configured to seat seven people. The airplane was equipped for night operations in IMC conditions. The airplane had been modified by supplemental type certificates (STCs) to include winglets, vortex generators, and wing spoilers. Additionally, the maximum continuous horsepower of each engine had been increased to 325-horsepower by an STC modification. The airplane had a total fuel capacity of 213.4 gallons (206 gallons usable) distributed between two wing fuel tanks.

The airplane was originally issued an FAA export certificate of airworthiness on May 22, 1980. The airplane was issued a Canadian registration number, C-GFJT, and was based in Canada until September 1986 when it was imported back into the United States and issued a standard airworthiness certificate and a new registration number (N144PC) on October 1, 1986. On April 12, 1993, the registration number was changed to N789UP.

According to an airplane utilization log found in the wreckage, the airplane's hour meter indicated 2,109.7 hours before the previous flight leg (BMI to IND). The airplane's hour meter was not located during the accident investigation. Calculations indicated that the airplane had accumulated about 1.9 hours during the final two flights (the previous flight from BMI to IND and the accident flight from IND to BMI).

According to available maintenance documentation, at the time of the accident, the airframe had accumulated a total service time of 8,390.2 hours since new. The last annual inspection of the airplane was completed on October 1, 2014, at 8,346.9 total airframe hours. The airplane had accumulated 43.3 hours since the annual inspection. The static system, altimeter system, automatic pressure altitude reporting system, and transponder were last tested on December 2, 2013. A postaccident review of the maintenance records found no history of unresolved airworthiness issues. Additionally, there was no record of recent maintenance to the airplane's glideslope antenna.

At the time of the accident, the left engine, serial number 503140, had accumulated a total service time of 4,881.5 hours since new and 556.7 hours since being overhauled on March 20, 2008. The left propeller, serial number EB1994, had accumulated a total service time of 6,936.4 hours since new and 165.3 hours since being overhauled on November 23, 2010.

At the time of the accident, the right engine, serial number 519303, had accumulated a total service time of 5,591 hours since new and 1,699.9 hours since being overhauled on June 13, 2000. The right propeller, serial number EB1993, had accumulated a total service time of 6,936.4 hours since new and 691.3 hours since being overhauled on February 10, 2006.

## Weight and Balance

The airplane's weight and balance for the accident flight and the preceding flight (BMI to IND) were calculated using the reported weights and seat positions for the pilot and the six passengers, maintenance records that established the airplane's basic empty weight and moment, fueling receipts/invoices, and recent flight tracking data.

According to the current weight-and-balance record, dated November 27, 2013, the airplane had an empty weight of 5,226.6 pounds (lbs) and a useful load of 1,860.4 lbs. The empty weight center-of-gravity (CG) was 156.52 inches aft of the datum. At maximum takeoff weight, 7,087 lbs, the forward and aft CG limits were 152.2 inches and 159.04 inches, respectively. At maximum landing weight, 6,750 lbs, the forward and aft CG limits were 151.2 inches and 160.04 inches, respectively.

The average fuel consumption rate was estimated to be 47.36 gallons per hour based on the accumulated flight time between known fuel tank top-offs. Based on this estimated fuel consumption rate and fuel receipts/invoices, the airplane departed BMI for IND with about 114.5 gallons of usable fuel. After landing at IND, the airplane was fueled with 60 gallons of fuel and subsequently departed on the accident flight with an estimated 133.4 gallons of usable fuel.

Weight and balance calculations estimated that the preceding flight (BMI to IND) departed 160 lbs over the maximum takeoff weight and with a CG aft of the permitted envelope. The calculations estimated that airplane landed 287 lbs over the maximum landing weight and with a CG aft of the permitted envelope.

Weight and balance calculations estimated that the accident flight departed 271 lbs over the maximum takeoff weight and with a CG about 4.37 inches aft of the permitted envelope. The calculations estimated that, at the time of the accident, the airplane was 366 lbs over the maximum landing weight and had a CG that was about 3.71 inches aft of the permitted envelope.

According to the FAA's Aircraft Weight and Balance Handbook, if the CG is maintained within the allowable limits for its weight, an airplane has adequate longitudinal stability and control. However, if the loaded airplane results in a CG that is aft of the allowable limits, the airplane can become unstable and difficult to recover from an aerodynamic stall. Additionally, if the unstable airplane should enter an aerodynamic spin, the spin could become flat making recovery difficult or impossible.

## METEOROLOGICAL INFORMATION

A National Weather Service (NWS) Surface Analysis Chart issued at 0100 depicted a stationary front extending across central Iowa, northern Illinois, and Indiana; the front was immediately north of Bloomington, Illinois. A second stationary front was depicted extending over Kansas, into Missouri, and turning southeastward into Tennessee and Alabama. The station models on the chart indicated northeast winds at 10 to 15 knots north of the stationary front located across Illinois and east-southeast winds at 5 knots or less south of the front. The station models also depicted an extensive area of overcast clouds over the region with most stations along and south of the front reporting light continuous rain, drizzle, and/or mist. The station model for Bloomington indicated wind from the east-southeast at about 5 knots, surface visibility restricted in mist, overcast cloud cover, temperature and dew point at 13°C, and a sea level pressure of 29.98 inches of mercury. The station models surrounding Bloomington indicated similar conditions with overcast clouds, light continuous rain, and/or mist.

A review of weather radar data recorded at 0004 revealed no significant radar echoes greater than 15 dBZ over the greater Bloomington-Normal area. The observed radar echoes were consistent with light rain. The observed radar echoes along the recorded flight track were consistent with the airplane operating in IMC during the approach and at the time of the accident.

At 2156, about an hour before the flight departed, the BMI automated surface observing system (ASOS) reported: wind 150° at 4 knots, an overcast ceiling at 1,200 ft above ground level (agl), 10 mile surface visibility, temperature 14°C, dew point 12°C, and an altimeter setting of 29.98 inches of mercury.

At 2303, about 4 minutes before the flight departed, the BMI ASOS reported: wind 140° at 6 knots, scattered clouds at 100 ft agl and an overcast ceiling at 800

ft agl, 2 mile surface visibility with light rain and mist, temperature and dewpoint 13øC, and an altimeter setting of 29.99 inches of mercury.

At 0005, about a minute before the accident, the BMI ASOS reported: wind 060ø at 6 knots, an overcast ceiling at 200 ft agl, 1/2 mile surface visibility with light rain and fog, runway visibility range (RVR) for runway 29 variable 4,000-6,000 ft, temperature and dewpoint 13øC, and an altimeter setting of 29.98 inches of mercury.

The terminal aerodrome forecast (TAF) issued at 1826 for BMI expected marginal visual flight rules (MVFR) conditions to prevail during the forecast period with a surface visibility greater than 6 miles, an overcast ceiling at 2,500 ft agl, and rain showers in the vicinity after 0100. The terminal forecast was amended at 2048, lowering the overcast ceiling to 1,200 ft agl. At 0038, an updated terminal forecast indicated that low instrument flight rules (LIFR) conditions were expected, including an overcast ceiling at 200 ft agl, and a 1/2 mile surface visibility with light drizzle and fog.

According to available information, the pilot used a commercial weather vendor (FlightPlan.com) to obtain his preflight weather briefing. The vendor logged weather briefings at 1614, 1957, 2117, and 2228. The briefings included weather reports, forecasts, and notices to airmen for the departure, destination, alternate, and selected nearby airports and pilot reports. The final weather briefing, obtained at 2228, included the TAF for Bloomington that had been issued at 2048, which forecasted MVFR conditions. The final briefing also provided weather conditions for nearby airports that were reporting LIFR conditions with overcast ceilings ranging between 200 and 300 ft agl. The final briefing did not include the area forecast or any in-flight weather advisories. The pilot filed an IFR flight plan from IND to BMI and designated Lambert-St Louis International Airport as his alternate airport.

## AIDS TO NAVIGATION

During an ILS approach, the localizer provides lateral guidance for the final approach course, and the glideslope provides vertical guidance as the aircraft descends toward the runway. For a precision approach, such as an ILS approach, the missed approach point (MAP) is where the aircraft reaches the decision altitude while on the glideslope. If a pilot observes an invalid glideslope indication, such as an "X" displayed through the glideslope scale of an electronic horizontal situation indicator or a warning flag on an analog course deviation indicator, the pilot may continue the instrument approach using the lateral guidance of the localizer; however, without the vertical guidance of a glideslope, a higher minimum descent altitude (MDA) is stipulated for the non-precision localizer instrument approach. Further, the location of the MAP for a non-precision approach will be a specified distance from a navigational aid, a fixed distance (from the final approach fix to the MAP) with an associated elapsed time that is based on the groundspeed of the aircraft, or a specific intersection/waypoint.

The published inbound course for the ILS runway 20 approach at BMI was 198ø magnetic, the crossing altitude for the final approach fix (EGROW) was 2,459 ft msl, and the distance between EGROW and the runway 20 threshold was 4.8 nm. The touchdown zone elevation was 871 ft msl. The decision altitude was 1,071 ft msl (200 ft agl) and required 1,800 ft RVR. The missed approach procedure was to climb on runway heading to 1,500 ft msl, then make a right turn to a 270ø magnetic heading and climb to 3,000 ft msl, then join the 214ø radial from the Pontiac VOR, and hold at MCLen intersection.

In the event of a loss of vertical guidance from the glideslope during an approach, or when performing the non-precision localizer approach, the MAP was located 4.8 nm from EGROW on the localizer. The non-precision localizer approach MDA was 1,260 ft msl (389 ft agl) and required 2,400 ft RVR. The MDA for a circling approach was 1,340 ft msl (468 ft agl) and required 1 mile surface visibility.

According to air traffic control documentation, at the time of the accident, all components of the ILS were functional, with no recorded errors, and the localizer was radiating a front-course to runway 20. A postaccident flight check found no anomalies with the instrument approach.

## AIRPORT INFORMATION

Central Illinois Regional Airport (BMI), a public airport located about 3 miles east of Bloomington, Illinois, was owned and operated by the Bloomington-Normal Airport Authority. The airport field elevation was 871 ft msl. The airport had two runways: runway 2/20 (8,000 ft by 150 ft, concrete) and runway 11/29 (6,525 ft by 150 ft, asphalt/concrete). Although the airport was equipped with an air traffic control tower, the control tower was closed at the time of the accident.

Runway 20 incorporated a dual-mode Approach Lighting System II (ALSF-2) and Simplified Short Approach Lighting System with Runway Alignment Indicator Lights (SSALR). The SSALR system was active when the control tower was closed. The runway was also equipped with runway touchdown zone and centerline lighting and high intensity runway edge lighting.

## FLIGHT RECORDERS

The airplane was not equipped, nor was it required to be equipped, with a cockpit voice recorder or flight data recorder.

## WRECKAGE AND IMPACT INFORMATION

The accident site was located in an open harvested corn field about 2.2 miles east-northeast of the runway 20 threshold and about 1.75 miles east of the localizer centerline. The GPS altitude of the accident site was 854 ft. The main wreckage consisted of the entire airplane, which was orientated on a 074ø magnetic heading. The wreckage was in an upright position, and there was no appreciable wreckage debris path. All observed airframe structural separations were consistent with impact related damage. The forward fuselage and cockpit were crushed upward and displaced aft. Flight control cable continuity was traced from the cockpit to the individual flight control surfaces. All observed flight control cable separations were consistent with overstress or were cut to facilitate recovery of the wreckage. There was no evidence of fire damage inside the cockpit, main cabin, aft fuselage, or empennage.

Both wings remained attached to the fuselage, and exhibited postimpact fire damage of their respective engine nacelles. Both ailerons were found partially separated from their respective hinge attachments. The aileron trim actuator extension measured 15/16 inch, which corresponded to the trailing-edge of the aileron trim tab being deflected up about 15ø. The aileron trim indicator was damaged during impact. The right wing leading edge outboard of the engine nacelle was crushed upward and displaced aft. The right wing deice boot and winglet were damaged by the postimpact fire. The left wing aft structural attachment exhibited features consistent with an overstress separation. The left winglet had separated from the wing, and was found adjacent to the wing. The left wing leading edge outboard of the engine nacelle was crushed upward and displaced aft.

The tail section was separated immediately aft of the aft pressure bulkhead and remained attached through control cables. Both elevators remained attached to their respective horizontal stabilizers. The elevator trim actuator extension measured 1 and 11/16 inch, which corresponded to the trailing-edge of the elevator trim tab being deflected up about 5ø. The elevator trim indicator was damaged during impact. The rudder remained attached to the vertical stabilizer. The rudder trim actuator extension measured 2 and 1/4 inch, which was consistent with a neutral rudder trim position. The rudder trim indicator was damaged during impact.

The nose and main landing gear were found fully retracted, and the cockpit selector handle was found in the "GEAR UP" position. A measurement of the wing flap control chain corresponded with a fully-retracted flap position. The flap selector handle and indicator were damaged during impact. An operational test of the wing spoiler actuators did not reveal any anomalies. The cockpit instrument panel sustained considerable damage during impact. The throttle quadrant was buckled and displaced to the right. Both throttles levers were found in the idle position and bent to the right. Both propeller levers were found full forward and bent to the right. Both mixture levers were found in an intermediate position and bent to the right. The cockpit altimeters had a Kollsman window setting between 29.98 and 29.99 inches of mercury. The stall warning horn and landing gear warning horn were extracted from the cockpit, and both horns produced an aural tone when electrical power was applied. Switch continuity for the wing-mounted lift sensor was confirmed. Both engine-mounted vacuum pumps exhibited impact and thermal damage. Disassembly of both vacuum pumps did not reveal any anomalies attributable to a preimpact malfunction.

Both integral wing fuel tanks were breached at their respective wingtips. Fuel was observed to drain from the left wing during wreckage recovery. Both fuel tank caps were found in the secured position. The airplane was equipped with cable-operated fuel selector valves, one for each engine, that were installed inboard of each engine nacelle. Both fuel selector valves were found in the OFF position; however, a reliable determination of the preimpact position was not possible due to impact related damage to the selector handles. The structure supporting the selector handles, located between the cockpit seats, had been displaced forward into a vertical position during impact. Both auxiliary fuel pumps exhibited thermal damage from the postimpact fire that precluded further testing.

Both engines remained partially attached to their respective nacelles and exhibited impact and postimpact fire damage. The observed thermal damage was concentrated between the airframe firewalls and the rear accessory section of each engine. Both propellers had separated from their respective engines and were found buried at a depth of about 18 inches in front of each engine. Both propellers retained their respective propeller flanges and a fractured portion of their respective engine crankshafts. Both crankshafts displayed a bend in one direction with circumferential cracks observed on the tension side of the bend, a 45ø shear lip fracture on the tension side, and an irregular/jagged fracture on the compression side. Mechanical continuity from the engine components to their respective cockpit controls could not be determined due to impact and fire damage. Internal engine and valve train continuity were confirmed when each engine was rotated through the accessory section. Compression and suction were noted on all cylinders in conjunction with crankshaft rotation. Teardown examinations of both engines and their respective turbochargers did not reveal any anomalies attributable to a preimpact malfunction. Additional documentation for each engine and turbocharger examination is included in the docket materials associated with the investigation.

Each propeller had one blade that was bent aft, one blade that appeared straight, and one blade that exhibited forward bending near the tip. Both propellers had their spinner domes formed around the propeller hub and counterweights. The spinner domes also exhibited a spiral/twisting deformation pattern. The observed blade and spinner dome damage was consistent with both propellers rotating at impact. Neither propeller was found in a feathered position. Both propellers were found on their respective start locks. According to the propeller manufacturer, for the propellers to be found on the start locks, the propeller blade angle at impact was either at or below the start lock angle when engine speed decreased below 700-900 rpm, or the blade forces during impact moved the blade angle into a start lock position after engine speed decreased below 700-900 rpm. A teardown examination of each propeller did not reveal any anomalies that would have precluded normal operation. Additional documentation for each propeller examination is included in the docket materials associated with the investigation.

## MEDICAL AND PATHOLOGICAL INFORMATION

The McLean County Coroner Office, located in Bloomington, Illinois, performed an autopsy on the pilot. The cause of death was attributed to multiple blunt-force injuries sustained during the accident. The autopsy also identified an enlarged heart with wall thickening and dilation of the chambers, 60-75% stenosis of the proximal left anterior descending artery, extensive interstitial myocardial fibrosis within the left ventricle, and severe atherosclerosis of the basal septum nodal artery. The FAA's Bioaeronautical Sciences Research Laboratory located in Oklahoma City, Oklahoma, performed toxicology tests on specimens obtained during the autopsy. The testing identified 0.010 gm/dl of ethanol in cavity blood; however, no ethanol was detected in liver or brain samples. Ethanol can be produced by microbial activity after death. Additional toxicology testing did not identify any drugs and medications in cavity blood.

The pilot's wife reported that the pilot had not experienced any major life events or stressors in the days or weeks preceding the accident. She stated that the pilot would typically sleep about 8 hours each night and that he never mentioned having any sleep-related issues. The pilot's wife stated that the pilot normally went to sleep at 10 pm and awoke at 6 am and that his sleep schedule was consistent with that routine for the 3 days preceding the accident. Additionally, she could not recall him being fatigued in the days preceding the accident. She reported that he had no serious health related issues and that he regularly exercised by running. She indicated that the pilot had recently seen a chiropractor for back pain and that he would take Aleve for pain management.

An acquaintance of the pilot reported that he and the pilot had a lengthy conversation during the hours before the accident flight as they waited for their respective passengers to return to the fixed based operator. According to the acquaintance, the pilot appeared very relaxed throughout their conversation and did not appear to be fatigued or ill.

According to FAA Advisory Circular No. 120-100, Basics of Aviation Fatigue, fatigue is a physiological state in which there is a decreased capacity to perform cognitive tasks and an increased variability in performance. Research has shown that fatigue is often attributed to extended wakefulness in which ample recovery sleep is not obtained, and that performance and alertness levels are largely influenced by the complex interaction between sleep and the 24-hour biological clock (circadian rhythm). When work is conducted during a normal sleep period, especially when it occurs after 16 hours of wakefulness, the disruption to the normal circadian rhythm can result in impaired cognitive function, performance degradation, and sleepiness. NTSB investigations have found that flightcrew on long duty days (a shift of more than 13 hours) exhibit a disproportionate amount of accidents when compared to those on short duty days (a shift of less than 13 hours). The longer the crews are awake, the more errors they tend to commit, especially cognitive errors such as decision making. Fatigue due to extended work hours, time of day, and shift work induces reductions in vigilance and reaction time and increases in risk of poor decisions, human error, incidents, and accidents.

## TESTS AND RESEARCH

### Glideslope Validity

A laboratory examination of the airplane's Garmin GNS 530W NAV/COM/GPS receiver, serial number 78410737, established that the active communication (COM) frequency was set to the BMI control tower frequency (124.6 MHz), which also served as the airport's CTAF when the control tower was closed. The standby COM frequency was set to Peoria Approach Control (128.725 MHz). The active navigation (NAV) frequency was set to the BMI ILS runway 20 instrument approach (111.9 MHz). The standby NAV frequency was set to the BMI VOR/DME frequency (108.2 MHz). The course deviation indicator (CDI) mode was selected to VOR/Localizer (VLOC). The Garmin GNS 530W did not record any historical flight parameter or navigational data.

A laboratory examination of the airplane's Garmin GNS 430W NAV/COM/GPS receiver, serial number 97103703, established that the active COM frequency was set to the BMI control tower frequency (124.6 MHz). The standby COM frequency was set to the BMI automatic terminal information service (ATIS)



frequency (135.35 MHz). The active NAV frequency was set to the BMI ILS runway 20 approach (111.9 MHz). The standby NAV frequency was set to the BMI VOR/DME frequency (108.2 MHz). The CDI mode was selected to VLOC. The Garmin GNS 430W did not record any historical flight parameter or navigational data.

The airplane was equipped with a Sandel Avionics SN3500 electronic horizontal situation indicator (EHSI), serial number 1058. The device performs the basic functions of a traditional horizontal situation indicator and radio magnetic indicator. Additionally, depending on installation, the device can provide RMI navigation to GPS waypoints, weather information, and traffic information. The device was configured to receive navigational data from the Garmin 530W and Garmin 430W as NAV Channels 1 and 2, respectively. The device recorded the incoming navigation data once per second to a 24-megabyte circular buffer. The intended purpose of the recorded data was for diagnostic purposes by the manufacturer. The device was sent to the manufacturer to be downloaded and decoded. The recovered dataset included, but was not limited to, the following historic flight parameters: latitude, longitude, ground speed, magnetic heading, ground track, VOR/ILS mode status, localizer and glideslope validity, and localizer and glideslope deviation. The device did not record an altitude data parameter.

A review of the data recorded by the Sandel Avionics SN3500 during the previous flight leg (BMI to IND) established that, despite being in ILS mode during the approach phase and having achieved a valid localizer state on both NAV channels, the device did not achieve a valid glideslope state until about 0.6 nm from the approach end of runway 23L at IND. A postaccident review of available weather documentation established that the airplane had landed at IND in day visual meteorological conditions that included a surface visibility of 10 miles and an overcast cloud ceiling at 2,400 ft agl (about 3,200 ft msl).

A review of the recovered data for the accident flight revealed that the Sandel Avionics SN3500 was in the ILS mode during the instrument approach phase and that it had achieved a valid localizer state on both NAV channels; however, the device never achieved a valid glideslope state on either NAV channel during the accident flight.

With the assistance of the manufacturer, the recorded data for the accident flight was replayed back through the Sandel Avionics SN3500 to document the navigational information that was displayed by the device. The replay confirmed that the glideslope did not achieve a valid state on either NAV channel during the accident flight. The device displayed a large "X" through the glideslope scale and did not display a glideslope deviation pointer. According to the Sandel Avionics SN3500 pilot's guide, an "X" through the glideslope scale and the absence of a glideslope pointer indicated a lack of valid glideslope data. According to the manufacturer, the glideslope deviation and validity state are independently determined by the NAV/COM/GPS devices (Garmin 530W and Garmin 430W) before being transmitted, along with other navigational data, to the SN3500 device as NAV Channel 1 and NAV Channel 2 data via a standard avionics data transfer protocol.

According to the FAA Instrument Flying Handbook, a glideslope signal consists of two intersecting radio signals that are modulated at 90 Hz and 150 Hz. According to Garmin, the operating conditions that would result in an invalid glideslope state include any of the following conditions:

- (a) In the absence of a glideslope radio frequency signal.
- (b) In the absence of 150 Hz modulation.
- (c) In the absence of 90 Hz modulation.
- (d) In the absence of both 90 Hz and 150 Hz modulation.
- (e) When the level of a standard deviation test signal, as generated during ground maintenance/testing, produces 50% or less of standard deflection of the deviation indicator.

#### Glideslope Antenna and Signal Diplexer

An additional examination of the airplane wreckage located the glideslope antenna on a small portion of radome structure. The radome had fragmented during the impact sequence. One of the solid wire antennas had separated from the antenna body and was not located during the investigation. The other solid wire antenna remained attached to the antenna body and exhibited minor damage. As found, the glideslope antenna was not connected to the coaxial cable that provided signal to the glideslope signal diplexer. Additionally, the coaxial cable was found crimped around a fuselage bulkhead stiffener. The observed crimp was consistent with damage sustained during the accident. The glideslope signal diplexer remained attached to the fuselage bulkhead, and its single coaxial input connector and two coaxial output connectors were found intact and properly secured. The remaining coaxial cable paths were continuous to the cockpit where the Garmin 530W and Garmin 430W had been previously removed during the investigation.

The glideslope antenna design incorporated a quarter-turn twist-lock BNC-type connector with the female portion of the connector installed on the glideslope antenna body. The male portion of the connector was attached to the coaxial cable that connected to the glideslope signal diplexer. A laboratory examination of the female portion of the connector revealed that it was intact with some minor deformation and light debris found on the interior and exterior surfaces. The locking pins of the female connector were intact, and no corrosion was observed. The male portion of the connector was intact and undamaged except for one of the six shielding/ground fingers. The damaged finger was folded and bent into the connector. The central conductor pin was undamaged, and no corrosion was apparent. Although initially found disconnected from the glideslope antenna, the coaxial cable could be reconnected and twist locked with minimal difficulty.

The electrical properties of the glideslope signal diplexer were subsequently evaluated at an avionics repair station. No repairs were made to the crimped portion of the coaxial cable that normally connected the glideslope antenna to the glideslope signal diplexer. A glideslope source signal of 92 decibels (dBm) was transmitted by the test bench through the coaxial cable that was connected to the diplexer. The signal level was measured after it passed through the diplexer at the two output connectors. During the bench test, the diplexer split the original source signal into two signal paths which measured 89.8 dBm and 88.8 dBm for glideslope 1 and 2, respectively. According to the bench technician, the observed differences between the source and output signals was normal and would not have affected glideslope signal transmission to the Garmin 530W and Garmin 430W that were located downstream of the diplexer. The operational bench test revealed no anomalies with the glideslope signal diplexer and, although damaged during impact, the coaxial cable demonstrated the ability to transmit an adequate glideslope signal to the diplexer.

## Aircraft Performance Simulation Study

A postaccident simulation study was completed by the National Transportation Safety Board's Vehicle Performance Division. The simulation study indicated that airplane's lateral flight path did not track the localizer centerline; the flight path was one or more dots to the right of the localizer centerline while inbound from the final approach fix. The airplane also flew one or more dots below the target glideslope until it leveled briefly near the minimum descent altitude for a localizer-only instrument approach. The simulation study indicated that the airplane did not intercept and track the glideslope at any time during the instrument approach. About 1.7 nm from the runway 20 threshold the airplane climbed through the glideslope guidance. About 1 nm from the runway 20 threshold, the airplane crossed through the localizer guidance width, from right to left, during a 90° left turn to an east course. The airplane made a series of pitch excursions as it flew away from the localizer.

The simulation study also indicated that the airplane was at 150 knots calibrated airspeed (KCAS) at the final approach fix, and it subsequently slowed below 80 KCAS on multiple occasions as it proceeded toward the runway and during the course deviation to the east. Based on the calculated angle of attack and lift coefficient data, the observed 90° left turn to the east was not associated with an aerodynamic stall; however, the simulation results indicated that the airplane likely encountered at least one aerodynamic stall during its course deviation to the east.

The simulation study also determined that the minimum engine power required to adequately match the recorded flight trajectory exceeded the maximum horsepower that could be generated by a single engine. Specifically, the simulation results indicated that 75% to 90% of time-varying dual engine power was required to achieve acceptable and simultaneous parameter match to the recorded altitude, latitude/longitude position, and ground speed data.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC17LA005	11/12/2016 1215 AKS	Regis# N4918Q	Ninilchik, AK	Apt: Ninilchik NIN
Acft Mk/Mdl CESSNA A185-F		Acft SN 18503575	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL MOTORS IO-520D		Acft TT 4587	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: LARRY D. NAUTA		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

## Events

1. Landing-landing roll - Sys/Comp malff/fail (non-power)

## Narrative

On November 12, 2016, about 1215 Alaska standard time, a tailwheel-equipped Cessna A185F airplane, N4918Q, sustained substantial damage during the landing roll at the Ninilchik Airport, Ninilchik, Alaska. The certificated airline transport pilot and the pilot-rated passenger sustained no injuries. The airplane was registered to, and operated by, the pilot as a visual flight rules (VFR) flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91. Visual meteorological conditions prevailed at the time of the accident, and a VFR flight plan had been filed. The flight originated from the Soldotna Airport, Soldotna, Alaska, about 1200.

During a telephone interview with the National Transportation Safety Board (NTSB) investigator-in-charge on November 13, the flying pilot, who was seated in the right seat at the time of the accident, stated that after an uneventful touchdown on the slightly wet and gravel surface of runway 10, the right-side brake system did not function as designed, which resulted in an asymmetrical braking condition. As the airplane continued the landing roll, the airplane ground looped to the left and the right wing and right horizontal stabilizer impacted the runway surface. The airplane came to rest on the runway without further incident.

The accident pilot stated that the previous landing was accomplished by the pilot-rated passenger and she reported no issues with the brake system during that landing sequence. The pilot further stated at the time of the accident, the wind condition originated from the north, about 10 to 15 knots. The airplane sustained substantial damage to the right wing and the right horizontal stabilizer.

In a written statement from a Federal Aviation Administration (FAA) aviation safety inspector (ASI) on November 16, he reported that he conducted an onsite examination of the airplane's brake system. He reported that he attempted to actuate the right brake, but the brake just went to the full travel stop. The right brake master cylinder filler plug was removed and a small tie wrap was utilized as a dip stick, and no fluid was observed on the tie wrap. The bottom of the fuselage and the right brake caliper were visually examined, and no signs of fluid leaks were observed. The accident pilot was asked if he previously observed the ground under the brake calipers at his parking space for evidence of any fluid leaks and the pilot reported he did look and did not observe any signs of fluid. The ASI additionally reported that the runway utilized by the accident pilot was in a useable condition, and that ice patches on the side of the runway were not a factor with the accident sequence.

In the recommendation section of the NTSB Accident/Incident Reporting Form 6120.1, the pilot stated that the accident may have been avoided if he depressed the brakes prior to landing to confirm both were functioning.

## METEOROLOGICAL INFORMATION

The closest weather reporting facility was the Homer Airport, Homer, Alaska. At 1153, an Aviation Routine Weather Report (METAR) was reporting in part: wind from 080 degrees at 17 knots, gusting 24 knots; visibility 6 statute miles; sky condition broken 3,600 feet; temperature 45 degrees F; dew point 37 degrees F; altimeter 29.11 inHg.

## TESTS AND RESEARCH

In a written statement from the accident pilot on December 20, he reported that the entire brake system was tested. The testing revealed that the right brake had an "extremely small leak (one drop)" from both o-rings at 500 pounds per square inch. The rest of the brake system appeared normal and no signs of brake fluid were found on the underside of the fuselage. He reported he assumed the leak was small and that only under pressure would it show signs of leaking, that is why no evidence of leaking was observed on any preflight activity prior to the accident. He further reported the o-rings on both calipers were replaced, the brake system was pressurized, and no further leaks were found.

In a written statement from the pilot on April 4, he reported that after replacing the brake lines, the right brake did not readily take fluid when pumped from the

caliper. The right brake master cylinder was disassembled, and the spring was observed to be deformed. He reported that in certain positions, the spring would block the flow of fluid in or out.

## ADDITIONAL INFORMATION

The FAA has published the Aviation Maintenance Technician Handbook - Airframe FAA-H-8083-31 (2012). This document discusses airplane brake systems and states in part:

Brake seals are very important. Without properly functioning seals, brake operation will be compromised or the brakes will fail. Over time, heat and pressure mold a seal into the seal groove and harden the material. Eventually, resilience is reduced and the seal leaks. New seals should be used to replace all seals in the brake assembly. Acquire seals by part number in a sealed package from a reputable supplier to avoid bogus seals and ensure the correct seals for the brake assembly in question. Check to ensure the new seals have not exceeded their shelf life, which is typically three years from the cure date.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA359	06/14/2017 1630 PDT	Regis# N4877Q	Salem, OR	Apt: Harchenko Industrial OR38
Acft Mk/Mdl CESSNA A188-B		Acft SN 18802613T	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL IO-550D10B		Acft TT 11505	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137
Opr Name: INDUSTRIAL AVIATION SERVICES INC	Opr dba:			Aircraft Fire: NONE
				AW Cert: SPR

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## Summary

The pilot reported that, during the takeoff roll for an agricultural flight, the airplane drifted left of the runway center, and the left wing and spray boom encountered tall grass. Subsequently, the airplane spun about 270°.

The airplane sustained substantial damage to both wings and the fuselage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The pilot reported in the Operator/Owner Safety Recommendation section of NTSB Form 6120.1 that the tall grass next to the runway "will be maintained shorter."

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## Cause Narrative

directional control during the takeoff roll, which resulted in the airplane contacting tall grass.

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## Events

1. Takeoff - Loss of control on ground
2. Takeoff - Collision with terr/obj (non-CFIT)

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## Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
3. Environmental issues-Physical environment-Object/animal/substance-Debris/dirt/foreign object-Effect on operation

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## Narrative

The pilot reported that during the takeoff roll for an agricultural flight, the airplane drifted left of the runway center, and the left wing and spray boom encountered tall grass. Subsequently, the airplane spun approximately 270°.

The airplane sustained substantial damage to both wings and the fuselage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The pilot reported in the Operator/Owner Safety Recommendation section of the NTSB Form 6120.1 that, the tall grass next to the runway "will be maintained shorter".

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA486	08/13/2017 2045 UTC	Regis# N305EF	Nashville, TN	Apt: John C Tune JWN
Acft Mk/Mdl CESSNA L19-E		Acft SN 24576	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: B V LAWSON		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA384	07/04/2017 1630 PDT	Regis# N66NF	Willits, CA	Apt: Ells Field-willits Muni O28
Acft Mk/Mdl CESSNA P210-R		Acft SN P21000860	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONT MOTOR TSIO-520-CE			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: DANIEL J. LEVIN TRUSTEE		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Landing - Loss of control in flight
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## Narrative

The pilot of the airplane reported that, while landing and trying to maintain the runway centerline, the airplane was "blown to the east, presumably by either stronger winds or gusts." He added that he continued to descend, while attempting to correct back to the right towards the runway centerline. He further added, that he was "fearing a stall," and elected to "put the plane down in the grass and dirt to the left of the runway." Unable to stop the forward momentum with full application of the brakes, the airplane continued over the edge of the embankment, and came to rest in the trees.

A witness, flying from another airplane in the pattern reported that, the accident airplane did not touch down until the second half of the landing runway. He added that, the airplane was "over the dirt" on the east side of the runway when it touched down and went off the embankment at the end of the runway. He observed the pilot exit the airplane and walk away.

The airplane sustained substantial damage to the fuselage and both wings.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The automated weather observation system about 21 nautical miles from the accident site reported, about the time of the accident, the wind was 150ø at 12 knots, gusting to 20 knots. The pilot landed on runway 16.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA287	08/19/2017 1310 EDT	Regis# N9155C	Clearwater, FL	Apt: Clearwater Air Park CLW
Acft Mk/Mdl CESSNA R182-NO SERIES		Acft SN R18200427	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-540			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: SOUTHWEST FLORIDA CONSULTING INC		Opr dba:		Aircraft Fire: NONE AW Cert: STN

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## Events

1. Enroute - Loss of engine power (total)
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## Narrative

On August 19, 2017, about 1310 eastern daylight time, a Cessna R182, N9155C, was substantially damaged during landing at Clearwater Air Park (CLW), Clearwater, Florida. The private pilot was not injured. The airplane was registered to and operated by the pilot as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed for the flight that departed Tampa Executive Airport (VDR), Tampa, Florida, about 1200.

According to the pilot, while on the downwind leg of the traffic pattern, the landing gear did not extend and lock. He then departed the traffic pattern and flew over the Gulf of Mexico to assess the situation. He performed the landing gear malfunction procedures listed in the pilot operating handbook; however, the landing gear would not lock. Next, he performed several maneuvers to get the landing gear to lock in the down position but was unsuccessful. He then maneuvered the airplane toward the airport and asked the local tower controller to look and see if the landing gear was down; however, the local controller could not verify that it was locked in the down position. The pilot elected to perform a gear up landing and advised the tower controller. Before contacting the runway, the pilot leaned the fuel mixture and the engine stopped producing power. After landing, the pilot determined that the nose landing gear was down and locked, therefore, he tried to maintain directional control of the airplane. After the airplane came to rest on the runway, he turned off the ignition, master switch, and pulled the fuel shutoff valve. He then egressed the airplane without injury.

A Federal Aviation Administration inspector who responded to the accident site stated that the left horizontal stabilizer was substantially damaged. An examination of the hydraulic system revealed that there was no hydraulic fluid in the reservoir.

The airplane was retained for further examination.



# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC17LA043 08/14/2017 633 AKD Regis# N745KP Juneau, AK Apt: N/a  
Acft Mk/Mdl CESSNA T207-UNDESIGNAT Acft SN 20700238 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 135  
Opr Name: KALININ AVIATION, LLC Opr dba: ALASKA SEAPLANES Aircraft Fire: NONE  
AW Cert: STN

## Events

1. Approach-VFR pattern final - Loss of engine power (total)

## Narrative

On August 14, 2017, about 0633 Alaska daylight time, a Cessna T207 airplane, N745KP, sustained substantial damage after it ditched in Auke Bay near Coghlan Island subsequent to a complete loss of engine power three miles west of the Juneau International Airport (JNU), Juneau, Alaska. The airplane was being operated as Flight 400 by Kalinin Aviation, LLC, dba Alaska Seaplanes, Juneau, as a scheduled commuter flight under the provisions of 14 Code of Federal Regulations Part 135 and visual flight rules. The commercial pilot and four passengers sustained no injuries. Visual meteorological conditions prevailed at the accident site and company flight following procedures were in effect. Flight 400 departed the Skagway Airport (SGY) in Skagway, Alaska, at 0547, destined for JNU.

During an interview on August 14 with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot stated that the purpose of the flight was to transport passengers from the Haines Airport (HNS) in Haines, Alaska, and the Skagway Airport to JNU. The pilot said that as part of his preflight check, he measured the fuel tank levels with a dipstick and estimated his fuel at 26 gallons in the right fuel tank and 11 gallons in the left fuel tank. He stated that during his preflight that morning, he observed clean, clear fuel after he sumped both tanks and the gascolator. At about 0530 he departed HNS with one passenger and flew about 13 minutes to SGY. He departed SGY at 0547 with three more passengers and flew for about 45 minutes to a straight in VFR approach to runway 8 at JNU. The pilot stated that he placed the fuel selector valve on the right fuel tank for the entire flight.

The pilot stated that during the approach, at about 3 miles from the runway and 900 feet altitude, the engine fuel flow reduced to almost zero and the engine lost all power. He switched from the right fuel tank to the left fuel tank and turned on the auxiliary fuel boost pump. Engine power was not restored and the pilot ditched the airplane near the southeast corner of Coghlan Island. Prior to landing, the pilot communicated his intentions to Juneau Air Traffic Control Tower. After the landing, the airplane remained upright and the passengers and pilot egressed through the front doors and swam about 80 feet to the shore. Neither the pilot nor passengers donned their life vests. The airplane then sank in about 70 feet of water. An Alaska Seaplanes Cessna 206 and a Coastal Helicopter Airbus AS-350 rescued the passengers and pilot within 30 minutes of ditching.

The airplane was recovered from the seafloor later that evening and transported to secure facility at JNU. The airframe sustained substantial damage to the left wing and fuselage. The fuel tanks were drained of fuel and sea water under the supervision of a Federal Aviation Administration (FAA) aviation safety inspector (ASI). Two gallons of aviation fuel were recovered from the right tank and eleven gallons from the left tank. On August 18, under the supervision of the NTSB IIC, a detailed airframe and engine examination was conducted with Cessna and Continental air safety investigators, the FAA ASI, and a representative from Alaska Seaplanes. Moderate wrinkling of each of the fuel tank bladders was present, with more extensive folds in the right fuel tank bladder. The engine ignition harness and magnetos were changed and the engine ran successfully.

The airplane was equipped with a Continental TSIO-520-G5B engine with a total time of 1436.6 hours. A Cessna T207 owner's manual addendum that was present in the airplane listed the unusable fuel as 2 gallons per tank.

At 0553, an aviation routine weather report from JNU (the closest weather reporting facility) reported, in part: wind 060 at 3 knots; visibility 10 statute miles in light rain; sky condition, few at 500 feet, scattered at 4,300 feet, overcast at 6,000 feet; temperature 52 ° F, dewpoint 52 ° F; altimeter, 29.78 in Hg.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# WPR17LA090 04/24/2017 1345 PDT Regis# N6218Y Banning, CA Apt: Banning Municipal KBNG  
Acft Mk/Mdl CESSNA T210N-N Acft SN 21064299 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl CONTINENTAL TSIO 520 Acft TT 2635 Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: ALEX M FURMAN Opr dba: Aircraft Fire: NONE

## Events

1. Enroute - Loss of engine power (total)

## Narrative

### HISTORY OF FLIGHT

On April 24, 2017, about 1345 Pacific daylight time, a Cessna T-210N, N6218Y, was substantially damaged when it touched down short of the runway at Banning Municipal Airport (BNG), Banning, California, following an engine power loss. The private pilot received minor injuries. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight.

According to the BNG airport attendant, he was in his office at BNG when he heard the pilot announce on the BNG common traffic advisory frequency (CTAF) that he had experienced a "massive power failure" and that he "was coming in hot for runway 26" via a right traffic pattern. The attendant looked out his office window and saw the airplane on a right downwind leg of the traffic pattern for runway 26; he thought the airplane was appropriately situated to make a normal landing. The attendant was aware that a helicopter was planning to depart BNG at that time, and radioed an advisory to the airplane, but did not hear any response from the airplane.

From his office, the attendant then watched the airplane descend on the final approach leg for runway 26. The airplane's approach appeared normal until the attendant observed a large "cloud of dust," and the attendant realized that there was a problem with the landing. The attendant exited his office, and drove out to the airplane. The pilot emerged from the airplane with some facial injuries, and the attendant suggested that he take the pilot to the hospital, to which the pilot agreed. Enroute to the hospital in the attendant's truck, the pilot requested that he be dropped at a rental car facility instead; the attendant then drove them to a local car rental facility, where the pilot obtained a rental car. The pilot told the attendant that he had left some personal items in the airplane, and needed to retrieve them prior to obtaining medical care. He then followed the attendant back to BNG.

The two vehicles arrived back at BNG about 1420, where they were stopped by Banning Police Department officers. The officers prevented the airport attendant from returning to the airplane, but allowed the pilot to drive to the airplane. Shortly after that, the pilot was detained by personnel from other law enforcement agencies who had responded to the scene, for reasons unrelated to the accident.

Sometime thereafter, a Federal Aviation Administration (FAA) inspector from the Riverside Flight Standards District Office arrived on scene. He was allowed a brief opportunity by the law enforcement personnel to question the pilot, and to examine the airplane. The airplane was moved to a hangar, and examined in more detail a few weeks later.

### PERSONNEL INFORMATION

FAA records indicated that the pilot obtained his private pilot certificate in July 2011, and that his most recent FAA first-class medical certificate was issued in September 2015. FAA records indicated that the pilot had purchased the airplane in March 2017, and that he also owned a Mooney M20 series airplane, N231GV.

A partially-completed "Pilot Logbook" was recovered from the airplane. Although it did not bear any ownership or identification information, the airplane registration numbers in the entries matched the two airplanes registered to the pilot. No endorsements were present in the logbook.

The first logbook entry was dated 12/14/16, and the first page of the logbook indicated that the pilot had 1,183 hours of flight experience. The final, partially completed page of the logbook indicated that the pilot had about 1,458 hours of flight experience.

The first 39 logbook entries were for the pilot's Mooney. The accident Cessna was first noted in this logbook on 1/25/17. With the exception of two flights in the

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Mooney, the remaining 76 flights were in the Cessna, for a total flight time in the Cessna of about 185 hours.

The logbook contained two entries for 4/23/17, the day prior to the accident. The first entry indicated a flight from ALN (St. Louis Regional Airport, Alton/St Louis, Illinois) to HQZ (Mesquite Metro Airport, Mesquite, Texas), with a flight duration of 2.5 hours. The second flight was from HQZ to SGR (Sugar Land Regional Airport, Houston, Texas), with a duration of 1.2 hours.

The final entries in the logbook were dated 4/24/17, the day of the accident. The first leg for that day was listed as being from SGR (to DMN, with a duration of 4.3 hours. The second and final entry indicated a departure airport of DMN, but no destination or flight duration.

Within a few hours of the accident, for reasons unrelated to the accident, the pilot was incarcerated by law enforcement agents, and thereby rendered unavailable for any further NTSB or FAA communications regarding this accident investigation.

## AIRCRAFT INFORMATION

The airplane was manufactured in 1981, and was equipped with a Continental Motors TSIO-520 series engine. According to the FAA inspector, the airplane hour meter indicated that it had a total time in service of about 2,635 hours. No maintenance records were able to be obtained for the investigation.

### Fuel System

The airplane was equipped with two wing (main) fuel tanks, for a total usable fuel capacity of 89 gallons. Two small reservoir tanks, one per side, were situated between their respective main fuel tanks and the fuel selector valve (FSV). Each of the four tanks was equipped with its own sump drain valve. The FSV had three settings, LEFT, OFF, and RIGHT.

An electric auxiliary fuel pump was located just downstream of the FSV. Beyond the auxiliary fuel pump, in the direction of fuel flow, were the fuel strainer and then the engine driven fuel pump (EDP). The EDP fed fuel to the fuel/air control unit, which in turn provided metered, pressurized fuel to the fuel manifold valve.

The fuel manifold valve was mounted on top of the engine, and its installation included one inlet line and six outlet lines, one per cylinder. Normal valve function closes off flow to the cylinders when the inlet fuel pressure falls below a value of about 4 pounds per square inch (psi). When the valve closes, fuel will typically be retained in the valve body.

## METEOROLOGICAL INFORMATION

The airport was equipped with an automated weather observation system (AWOS), but the AWOS data was not obtained by the investigation. The National Weather Service weather observations for the city of Cabazon, located about 2 miles east of BNG, indicated that the winds were from the west to west-northwest at 17 mph, with gusts to 28 mph. Sky condition was clear, and the temperature was about 15ø C, with a dew point of 9ø C.

## AIRPORT INFORMATION

The airport was equipped with a single paved runway, designated 8/26. The runway measured 4,955 feet by 100 feet, and airport elevation was 2,222 feet msl. Runway 26 had a displaced threshold of about 300 feet, and was equipped with a two-light pulsating precision approach path indicator (PAPI). It was not equipped with an air traffic control tower; BNG air traffic communications and coordination were accomplished via the CTAF. The CTAF communications were not recorded.

## WRECKAGE AND IMPACT INFORMATION

Ground scars indicated that the airplane touched down about 180 feet short of the paved beginning of runway 26. The airplane came to rest a few feet beyond the beginning of the pavement, after it penetrated a wire fence just east of the runway. The nose gear had collapsed sometime during the event, and the tailcone, right wing, right horizontal stabilizer, and right elevator exhibited crumpling, crush, and tearing damage.

As a result of his examination on the day of the accident, the FAA inspector reported that the left fuel tank was devoid of fuel, and that the right fuel tank was

between one-eighth and one-quarter full. Neither wing fuel tank was breached. The FAA inspector found the fuel selector valve in the "OFF" position, but was unable to determine when it was placed in that position, or by whom. The airplane was placed in a secure hangar for further, examination at a later date.

The airplane was examined in greater detail about a month after the accident by an NTSB investigator and a certificated mechanic with an Inspection Authorization rating. The examination and results are described in the sequence that the examination was conducted. The airplane was resting on its main gear, in an approximately level pitch attitude, its nose supported by hangar equipment. The engine remained attached to the airframe, and the propeller remained attached to the engine. The three propeller blades displayed limited but varying amounts of aft bending.

The FSV handle was found in the OFF position. Actuation of the fuel strainer drain handle in the engine compartment did not result in any liquid being drained from the fuel strainer. The fuel line from the fuel/air control unit to the fuel manifold valve was then disconnected at the fuel manifold valve; no fuel was present in that line.

The left fuel tank was visually observed to be empty, and no fuel was obtained from the left wing sump drain when it was activated. The FSV handle was placed in the LEFT wing tank position, and less than an ounce of clear fuel was obtained from the open end of the line that was previously disconnected at the fuel manifold valve. The auxiliary fuel pump was then turned on, and about 12 ounces of fuel were collected from that disconnected line end before the flow ceased.

The right tank fuel depth measured about 4.5 inches. The tank was then drained, which yielded a total of about 27 gallons of fuel. Fuel was obtained from the left and right reservoir tank sump drains.

The fuel manifold valve was partly disassembled, and fuel was present in the valve body. The diaphragm was pliable and intact, and the screen was clean. The spark plug electrodes appeared normal, and the engine was able to be rotated easily by hand. Thumb compressions and magneto-produced sparks were observed at all cylinders, in proper firing order sequence.

No evidence of preimpact mechanical malfunction was noted during the examination of the recovered airframe and engine.

## ADDITIONAL INFORMATION

### Previous Fuel Purchases

According to an airport attendant at Deming Municipal Airport (DMN), Deming, New Mexico, the airplane was fueled with 74.9 gallons about 1000 local time on the morning of the accident. No records of any other fuel purchases were obtained.

### Investigation Uncertainties or Unknowns

Several details of the flight and accident events were unable to be determined with certainty, as noted below.

The pilot's recounts of the sequence of events varied, but most information indicated that he had departed DMN earlier that day, and was destined for Corona Municipal Airport (AJO), Corona, California. However, it was unclear whether he made any interim stops after he departed DMN.

According to verbal reports from the US Customs and Border Patrol Air and Marine Operations Center (AMOC), shortly before the accident, the AMOC radar tracked the airplane departing from Jacquelin Cochran Airport (TRM), Thermal, California. However, multiple NTSB requests to the AMOC for more specific or comprehensive tracking or flight data did not result in the provision of any additional information. For reference and orientation purposes, TRM is situated between the pilot's stated departure and destination airports (DMN and AJO), and also between the departure airport and the accident airport (DMN and BNG). TRM is about 433 nm west of DMN, and about 39 nm east of BNG. AJO is about 34 nm west of BNG.

The pilot did not specify his altitude or location when he experienced the power loss, or any details regarding his flight path, altitude, or configuration as he maneuvered towards BNG. The pilot provided unclear and conflicting reports about whether the power loss was partial, complete, or initially a partial power loss that subsequently degraded to a complete power loss. Finally, he did not provide any information regarding his post power loss or post accident actions. Investigation attempts to communicate with the pilot after the day of the accident were unsuccessful.

The investigation was unable to determine when, or by whom, the fuel selector valve was placed in the OFF position. The investigation was unable to determine whether that occurred inadvertently in flight, intentionally in flight in preparation for the emergency landing, or after the accident by either the pilot or first responders.

No air traffic control communications or radar tracking data regarding the flight were able to be obtained, and no airport communications were recorded.

## Precautionary & Forced Landings

Due to the lack of information provided by the pilot, the investigation was unable to determine the pilot's options, or his decisions and actions, after he detected the engine problem. According to the Airplane Flying Handbook ("AFH", FAA-H-8083), two types of emergency landings are 'Forced landings' and 'Precautionary landings.' A forced landing is defined as an "immediate landing, on or off an airport, necessitated by the inability to continue further flight," and the typical initiator is a complete loss of engine power in a single engine airplane. A precautionary landing is a "premeditated landing, on or off an airport, when further flight is possible but inadvisable." The AFH continued with "A precautionary landing, generally, is less hazardous than a forced landing because the pilot has more time for terrain selection and the planning of the approach. In addition, the pilot can use power to compensate for errors in judgment or technique."

The AFH then stated that "When the pilot has time to maneuver, the planning of the approach should be governed by" wind direction and velocity, dimensions and slope of the selected landing area, and obstacles in the final approach path. The AFH continued with "when compromises have to be made, the pilot should aim for a wind/obstacle/terrain combination that permits a final approach with some margin for error in judgment or technique."

Neither the AFH nor any other FAA guidance elaborated on principles or techniques to provide the "margin" advocated above. However, an internet search yielded multiple relevant articles from sources including AOPA (Aircraft Owners and Pilots Association), Aviation Safety magazine, and Skybrary. These articles concerned the topic of "energy management" as it related to powered and unpowered flight.

Energy is a primary parameter for the alteration of a flight path. With limited or no engine power, the primary energy sources are airplane speed and altitude; a pilot's manipulation of these will determine the rate of energy loss. The control of energy dissipation, referred to as "energy management," determines the range capability of the unpowered (gliding) airplane. During a low-powered or unpowered approach, selection of the ground track towards the intended landing location is a key component of energy management. Appropriate track selection and energy management will help ensure that sufficient altitude and/or airspeed is available to provide the corrective-action "margin" advocated above by the AFH. Generally, the most direct path to a point close to the landing area threshold, conducted at best glide speed, and combined with delayed deployment of flaps and landing gear, will be the most conservative energy management strategy.

Finally, the AFH noted that "experience shows that a collision with obstacles at the end of a ground roll is much less hazardous than striking an obstacle at flying speed before the touchdown point is reached."

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA17CA414	07/16/2017 1530	Regis# N166Z	Albuquerque, NM	Apt: Albuquerque Intl Sunport ABQ
Acft Mk/Mdl CESSNA TU206-G		Acft SN U20606923	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl TCM TSIO-520M7B		Acft TT 4887	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR PUBU
Opr Name: USDA FOREST SERVICE FIRE & AVIATION		Opr dba:		Aircraft Fire: NONE AW Cert: STN

## Events

1. Landing - Abnormal runway contact

## Narrative

The pilot reported that, during the landing touchdown, a gust of wind caused the airplane to float back into the air. Subsequently, the airplane porpoised, and he initiated a go-around. The second landing was uneventful, however, before the airplane exited onto the taxiway the front wheel seized.

A post-accident examination revealed that, the front tire rim was damaged and the tire was flat.

The airplane sustained substantial damage to the firewall.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The automated weather observation system on the accident airport reported, about the time of the accident, the wind from 120ø at 11 knots. The pilot landed on runway 12.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA471	08/05/2017 1030	Regis# N1227G	Nampa, ID	Apt: Nampa Muni MAN
Acft Mk/Mdl CHAMPION 7ACA		Acft SN 7AC-4921	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: T-CRAFT AERO CLUB INC		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC16FA057	08/13/2016	1330 AKD	Regis# N9541S	Chugiak, AK	Apt: Birchwood BCV
Acft Mk/Mdl CHAMPION 7ECA			Acft SN 406	Acft Dmg: DESTROYED	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING ENGINES O-235-C2C			Acft TT 1914	Fatal 1 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WILLIAM L. ROWE			Opr dba:		Aircraft Fire: GRD
					AW Cert: STA

## Events

1. Initial climb - Loss of engine power (total)

## Narrative

On August 13, 2016, about 1330 Alaska daylight time, a Champion 7ECA (Citabria) airplane, N9541S, impacted terrain following a loss of engine power just after takeoff from Birchwood Airport, Chugiak, Alaska. The private pilot sustained fatal injuries, and the airplane was destroyed. The airplane was registered to the pilot and a co-owner and operated by the pilot as a 14 Code of Federal Regulations Part 91 visual flight rules personal flight. Visual meteorological conditions existed near the accident site at the time of the accident, and no flight plan was filed for the intended local flight.

According to multiple witnesses at Birchwood Airport, they observed the airplane perform several touch-and-go landings throughout the late morning and early afternoon on the day of the accident. They said that, just after 1300, the pilot made a full-stop landing and then taxied to a local fuel vendor's facility.

During a postaccident interview, one of the witnesses stated that the accident airplane had been for sale and that the accident pilot had met him and a friend at Birchwood Airport about 1315 to show the potential buyer the airplane. The potential buyer reported that he "walked around the airplane" and noticed no mechanical problems and that the pilot told him that there were no mechanical problems with the airframe and engine. The pilot asked the potential buyer if he would like to go for a ride in the airplane, and the potential buyer declined and said he would only go for a ride if he offered to purchase the airplane. The pilot then started the airplane and departed from runway 2R, which was 2,200 ft long and 50 ft wide. The potential buyer said he watched the airplane as it departed and that, as it neared the departure end of the runway, it turned "steeply to the right about 90 degrees," followed by a nose-and-right-wing-low descent. The airplane subsequently descended behind a stand of trees and hangars and out of view.

Two other witnesses, who were located near the departure end of runway 2R, reported that, after the airplane departed, they heard the engine making a "pop pop" sound and that it then appeared to lose power. Another witness reported hearing the engine "sputtering" and stated that the airplane appeared to stall. All the witnesses reported that they saw the airplane turn steeply to the right, the airplane's right wing and nose drop abruptly, and the airplane continue to descend nose down behind several hangars and impact terrain. A postimpact fire ensued, and the airplane was destroyed.

A witness who was flying a helicopter about 1/2 mile east of Birchwood Airport before the accident reported hearing a male voice on the airport's common traffic advisory frequency (CTAF) stating that he was taking off from runway 2R and would make a right turnout. The helicopter pilot reported that he saw the accident airplane and that it appeared "lower than what I would expect." The airplane began an early right crosswind turn near the airport. The helicopter pilot noticed that the bank of the right turn appeared steep considering the low altitude of the airplane. The helicopter pilot reported that, about 90° into the right turn, he heard a male voice transmit on the CTAF, "oh [expletive]." Immediately after the radio transmission, the airplane "appeared to stall and enter a very nose down attitude." The helicopter pilot saw the airplane descend until it disappeared below the tree line.

## PERSONNEL INFORMATION

The pilot held a private pilot certificate with an airplane single-engine land rating. His most recent Federal Aviation Administration (FAA) third-class medical certificate was issued on June 1, 2015, and contained no limitations. On the medical certificate application, the pilot reported a total time of 206 hours, with 0 hours in the last 6 months.

A review of the pilot's personal logbook revealed that he had a total of 194.2 flight hours, all of which were in single-engine airplanes.

## AIRCRAFT INFORMATION

The two-seat, tailwheel-equipped airplane was equipped with a 115-horsepower Lycoming O-235-C2C engine. The engine was equipped with a two-bladed McCauley metal propeller.



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# National Transportation Safety Board - Aircraft Accident/Incident Database

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According to the airplane's maintenance logbook, the engine was installed on June 14, 1974. The last annual inspection of the airframe and engine was performed on April 2, 2016, at which time the engine total time was 1,313.02 hours, including 383.8 hours since its last major overhaul, and the airframe total time was 1,913.8 flight hours, including 383.8 hours since the last major overhaul.

## METEOROLOGICAL INFORMATION

The official weather observation station located at the Birchwood Airport was not reporting full METAR data at the time of the accident. The closest official weather observation station was located at the Wasilla Airport, Wasilla, Alaska, about 9 miles north of the accident site. At 1336, a METAR reported, in part, wind 090ø at 5 knots; visibility 10 statute miles; clouds and sky condition, few clouds at 8,000 ft; temperature 64øF; dew point 48øF; altimeter setting 29.56 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

The accident site was about 1,725 ft northeast of the departure end of runway 2R on the north side of a "t" intersection of Birchwood Spur Road and Stoltze Drive (A terrain image of the accident site location in relation to the departure runway is available in the public docket for this accident). The accident site was bordered on the north side by a wooded area and was about 260 ft east of airport hangars. The initial impact point was on about a 351ø heading, and the airplane was resting upright on sloping terrain (about 45ø), with the left wing closest to Birchwood Spur Road, and the right wing closest to the bottom of the sloping terrain at the "t" intersection. No wreckage path was present at the accident site. Ground scarring was limited to the planform area of the airplane. The wreckage was recovered and transported to a secure facility for examination.

The airplane exhibited about a 45ø-nose-down crushing of its firewall with the vertical stabilizer displaced left about 10ø. The airplane was destroyed by postimpact fire. The responding firefighting personnel reported that foam was used to extinguish the fire. All of the major airplane components were found at the accident site.

The fuselage was twisted, and the empennage was displaced forward and to the left near the left wing. Various tube attachment points were separated due to impact forces. The majority of the airplane's fabric was melted by the postimpact fire except for several feet on the left wing's outboard section.

All the windscreens were missing. The cockpit and instrument gauges were consumed by the postimpact fire, and no readings/positions could be determined. The cockpit structure was crushed from downward impact forces. Flight control continuity was established from the control surfaces to the cockpit.

The propeller was separated from the crankshaft flange at the mechanical attachment point on the hub. All the propeller bolts were in place within the propeller hub. Neither of the propeller exhibited S-shaped bending and/or chordwise gouging/scratching.

The engine's top spark plugs were removed, and the engine was rotated by hand. During the rotation, air was drawn in and expelled through each top spark plug hole. Engine and valve train continuity was confirmed. Borescope inspection of the cylinders revealed no mechanical anomalies.

No liquid was found in the fuel system due to impact damage and the postimpact fire. The fuel selector was in the "on" position, and the selector manifold and selector valve did not contain debris upon disassembly. The carburetor heat was found in the "off" position. The throttle was found in the "full forward" position.

The carburetor was found displaced from the engine, and the throttle/mixture controls were attached to their respective control arms of the carburetor. The fuel inlet screen did not contain debris. The carburetor fuel hose was consumed by the postimpact fire. The carburetor was opened, and the fuel bowl had no visible contaminants. The float assembly hinge remained secure at the mounting and was not damaged. The float pontoon and float arm were consumed by postimpact fire.

During the engine examination, no evidence of anomalies, contamination, or malfunctions were found in any of the engine accessories, including the magnetos, ignition harness, induction system, spark plugs, oil pump, oil cooler, and oil filter. The cylinders, pistons, valve train, crankshaft, and other internal components showed no evidence of anomalies or malfunctions.

## MEDICAL AND PATHOLOGICAL INFORMATION

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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The Alaska State Medical Examiner, Anchorage, Alaska, performed an autopsy of the pilot. The autopsy report attributed the pilot's cause of death to multiple blunt force injuries with a contributing cause of thermal injuries.

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology tests on the pilot's specimens. The results were negative for carbon monoxide, cyanide, ethanol, and drugs.

## TESTS AND RESEARCH

### Fuel Testing

The pilot purchased 10.45 gallons of 100 low-lead fuel at 1316. A fuel sample from the fuel facility was tested by the owner with the National Transportation Safety Board investigator-in-charge present, and no fuel contamination was found. There were no reports of fuel contamination or operating anomalies from pilots of other airplanes that were fueled before or after the accident from the fuel pump at the airport.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA396	07/08/2017 1020 PDT	Regis# N5195X	Cottonwood, ID	Apt: Cottonwood Muni S84
Acft Mk/Mdl CHAMPION 7KCAB		Acft SN 195	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING IO-320-E2A		Acft TT 3387	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: MICHAEL ORR		Opr dba:		Aircraft Fire: NONE
				AW Cert: STA

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## Events

1. Landing-landing roll - Loss of control on ground

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## Narrative

The pilot of the tailwheel-equipped airplane reported that, during the landing roll, the airplane drifted to the right and he applied left rudder to correct. The airplane exited the runway to the right and ground looped to the right. The left wing and left elevator impacted the ground and sustained substantial damage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA137	03/26/2017 1325 CDT	Regis# N782JR	Cleveland, TN	Apt: Cleveland Rgnl Jetport RZR
Acft Mk/Mdl CIRRUS DESIGN CORP SR20-NO SERIES	Acft SN 2337	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual	Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL IO-360-ES	Acft TT 201	Fatal 0	Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: RIDDLEY RETAIL FIXTURES, INC	Opr dba:	Aircraft Fire: NONE	AW Cert: STN	

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## Events

1. Initial climb - Aerodynamic stall/spin
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## Narrative

The flight instructor was conducting an instructional flight in the airplane, which was owned by the student pilot. The flight instructor reported that he did not notice that the student pilot did not set the flaps to the appropriate position for takeoff, as required on the before takeoff checklist. Immediately after rotation, during the initial climb, the student pilot had difficulty maintaining directional control. The flight instructor took control of the airplane about 10 ft above the runway, the stall warning annunciator was audible, and the airplane began sinking. The flight instructor pushed the nose over but was unable to recover before the airplane landed hard and then departed the right side of the runway. The landing gear dug into the mud, the airplane then spun around and the nose gear and left main landing gear collapsed, which resulted in substantial damage to the elevator and vertical stabilizer. The flight instructor reported that there were no preimpact mechanical failures or malfunctions with the airplane that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA322    07/04/2017 1900 EST    Regis# N17XK    Hamilton, OH    Apt: Butler County Regional Airport KHAO  
Acft Mk/Mdl CLASSIC AIRCRAFT CORP WACO    Acft SN F5C-048    Acft Dmg: SUBSTANTIAL    Rpt Status: Prelim    Prob Caus: Pending  
Fatal 0    Ser Inj 0    Flt Conducted Under: FAR 091  
Opr Name: ADVENTURE AIRTOURS LLC    Opr dba:    Aircraft Fire: NONE

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## Events

1. Landing-landing roll - Landing gear collapse
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## Narrative

On July 4, 2017, about 1900 eastern daylight time, a Waco YMF airplane, N17XK, experienced a gear collapse after landing at the Butler County Regional Airport-Hogan Field, Missouri. The pilot and two passengers were not injured and the airplane was substantially damaged during the landing. The airplane was registered to and operated by Adventure Airtours, LLC, under the provisions of 14 Code of Federal Regulations Part 91 as a local sightseeing flight. Visual meteorological conditions prevailed at the time.

The pilot reported to the Federal Aviation Administration (FAA) inspector, that after landing, he applied the left and right brakes to initiate a right turn to the taxiway. The pilot added that the right brake "grabbed and locked", causing the airplane's tail to swing left. The left wing then struck the ground, and the airplane came to a stop.

An inspection of the airplane noted substantial damage to the left wing spar.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA264	07/29/2017 930 EDT	Regis# N747CB	Orlando, FL	Apt: Executive ORL
Acft Mk/Mdl CONSOLIDATED AERONAUTICS INC.	Acft SN 754	Acft Dmg: SUBSTANTIAL	Fatal 0	Rpt Status: Prelim Prob Caus: Pending
		Ser Inj 0	Fit Conducted Under: FAR 091	
Opr Name: BRICKER HAROLD R	Opr dba:		Aircraft Fire: NONE	
			AW Cert: STN	

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## Events

1. Taxi-from runway - Abrupt maneuver
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## Narrative

On July 29, 2017, about 0930 eastern daylight time, a Consolidated Aeronautics Lake LA-4-200, N747CB, was substantially damaged while taxiing, after landing at the Orlando Executive Airport (ORL), Orlando, Florida. The pilot was not injured. Visual meteorological conditions prevailed and no flight plan was filed for the local flight. The airplane was owned and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91.

According to a Federal Aviation Administration inspector, the pilot was taxiing the airplane to a hangar, when it rolled into a ditch, and sustained substantial damage to its right wing.

The four-seat, low-wing amphibious airplane, was manufactured in 1976. It was powered by a Lycoming IO-360, 180-horsepower engine.

The airplane was retained for further examination.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA15LA276 07/18/2015 2125 EDT Regis# N8969L Lititz, PA Apt: Lancaster LNS  
Acft Mk/Mdl GRUMMAN AMERICAN AVN. CORP. AA1B Acft SN AA1B-0419 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl LYCOMING O-235-C2C Acft TT 3011 Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: RATHMELL, JOHN P Opr dba: Aircraft Fire: NONE  
AW Cert: STU

## Summary

The flight instructor reported that he and a student pilot were performing touch-and-go landings in the airport traffic pattern at night; the instructor was flying the airplane. While on the downwind leg for the third and final landing, he reduced the engine power and the engine subsequently experienced a partial loss of power. The instructor switched the fuel tank selector and attempted to restore power, but was unsuccessful. He then performed a forced landing to a cornfield, during which the airplane nosed over. The instructor's statement did not address whether he used carburetor heat during the accident flight, and the carburetor heat control was found in the full-forward (off) position. An examination of the wreckage revealed no evidence of preimpact mechanical anomalies with the airframe or engine. The spark plugs were light gray in color and exhibited normal wear. The fuel quantity onboard the airplane at the time of the accident could not be determined. Although the weather conditions at the time of the accident were conducive to the accumulation of carburetor icing at glide power, the reason for the loss of engine power could not be determined.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A partial loss of engine power for reasons that could not be determined because postaccident examination of the engine found no mechanical malfunctions or failures that would have precluded normal operation.

## Events

1. Approach-VFR pattern base - Loss of engine power (partial)
2. Emergency descent - Off-field or emergency landing
3. Landing-landing roll - Nose over/nose down

## Findings - Cause/Factor

1. Not determined-Not determined-(general)-(general)-Unknown/Not determined - C

## Narrative

On July 18, 2015, at 2125 eastern daylight time, a Grumman American AA-1B, N8969L, was substantially damaged during a forced landing after a partial loss of engine power in Lititz, Pennsylvania. The flight instructor and a passenger, who was a student pilot were not injured. Night visual meteorological conditions prevailed and no flight plan was filed. The local personal flight was operating in the traffic pattern at Lancaster Airport (LNS), Lancaster, Pennsylvania, and was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to the flight instructor, the airplane had not been flown in a while, and the purpose of the flight was to "take it around the airport pattern for a few landings." He and the student pilot had just completed a flying lesson in another airplane, and he invited the student to fly with him on the accident flight. Prior to the flight, the airplane's battery required a jump-start to start the engine, after which the flight instructor ran the engine for 20 minutes to charge the battery. He shut down the engine, restarted it successfully, and then repositioned the airplane to add 13 gallons of non-ethanol automotive fuel, and estimated the total fuel quantity on board was 16 gallons. Prior to takeoff, he performed a preflight inspection and engine run-up with no issues noted. The flight departed runway 31, remained in the traffic pattern, and performed two touch-and-go landings. On the third and final circuit in the traffic pattern, while on the downwind leg, the pilot reduced the engine power and selected 15ø of flaps to initiate a descent to the runway. When the airplane was on the base leg of the traffic pattern, the engine experienced a partial loss of power. The pilot raised the flaps, increased the mixture to rich, and switched the fuel selector in an attempt to restart the engine. He then elected to perform a forced landing and turned toward a cornfield. After landing in the cornfield, during the landing roll, the airplane nosed over and came to rest inverted.

Examination of the wreckage by a Federal Aviation Administration (FAA) inspector revealed that the outboard section of the right wing leading edge, fuselage nose section, and rudder were substantially damaged. Flight control continuity was confirmed from the cockpit controls to the control surfaces. The throttle, mixture, and carburetor heat controls were found in the full forward position, and remained connected to their respective locations on the engine. The inspector was unable to examine the fuel tanks for fuel quantity due to the airplane's inverted orientation. Crop damage leading up to the wreckage was about 90 feet long and oriented east-northeast.

A subsequent examination of the engine by an FAA inspector revealed that all four cylinders exhibited thumb compression and both magnetos produced spark on all towers. Crankshaft and valvetrain continuity were established by manual rotation of the propeller. The top spark plugs were removed, the electrodes were

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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intact, grey in color, and a small amount of oil was present on the No. 1 electrode. The wings had previously been removed, which precluded inspection of the fuel tanks.

According to the airplane maintenance records, it had accrued about 2 hours of operation between November 2012 and March 2014, 1 hour of operation between March 2014 and March 2015, and 0.6 hour between March 2015 and the time of the accident, including the accident flight. The most recent annual inspection was performed on March 20, 2015. At that time, the engine had accrued a total of 3,011 hours, with 1,079 hours since overhaul.

The pilot held commercial and flight instructor certificates with ratings for airplane single-engine land and instrument airplane. According to his logbook, he had accrued a total of 320 flight hours, and he reported 2 hours of flight experience in the same make and model as the accident airplane. His most recent first class medical certificate was issued on July 16, 2015.

The recorded weather at LNS, at 2153, reported wind from 050ø at 5 knots; visibility 10 statute miles; few clouds at 11,000 ft above ground level; temperature 23ø C; dew point 22ø C; and an altimeter setting of 29.92 inches of mercury.

The carburetor icing probability chart from Federal Aviation Administration (FAA) Special Airworthiness Information Bulletin (SAIB): CE-09-35 Carburetor Icing Prevention, June 30, 2009, indicated a probability of serious icing at glide power at the temperature and dew point reported at the time of the accident. The pilot did not mention if he utilized the application of carburetor heat during the accident sequence.



# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA047	11/01/2016 1535 EST	Regis# N525	Atlanta, GA	Apt: Dekalb-peachtree PDK
Acft Mk/Mdl HAWKER BEEHCRAFT CORP G58-NO	Acft SN TH-2188	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending	
Eng Mk/Mdl CONT MOTOR IO-550-C	Acft TT 1230	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091	
Opr Name: PHILLIP SADLER	Opr dba:	Aircraft Fire: NONE		AW Cert: STN

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## Summary

According to the commercial pilot, the multiengine airplane was about 5 miles from the airport when it was cleared to land on runway 3R. Then, about 1.5 miles from the airport, he accepted a landing clearance change from the air traffic controller to land on runway 3L instead of 3R. The pilot increased engine power and set up to land on runway 3L; however, the airplane was "fast" on final approach and landed "long." The pilot "stood" on the brakes, the left tire "blew out," and the airplane veered off the left side of the runway. After departing runway 3L, the airplane traveled through the grass and impacted asphalt of another runway, which was raised about 7 inches above the ground. When the nose landing gear struck the asphalt, it collapsed, and the airplane then came to rest. During the accident sequence, the fuselage and wings were substantially damaged. The pilot reported no preimpact mechanical malfunctions or failures with the airplane that would have precluded normal operation. The wind at the airport around the time of the accident was from 140øat 7 knots.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain the proper airspeed during final approach and his subsequent loss of directional control during landing, which resulted in a runway excursion.

## Events

1. Landing-landing roll - Loss of control on ground
2. Landing-landing roll - Runway excursion

## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Airspeed-Not attained/maintained - C
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
4. Environmental issues-Physical environment-Object/animal/substance-(general)-Contributed to outcome

## Narrative

According to the commercial pilot, the multiengine airplane was approximately 5 miles from the airport when it was cleared to land on runway 3R. Then, about 1.5 mile from the airport, he accepted a landing clearance change from the air traffic controller to land on runway 3L instead of 3R. The pilot increased engine power and set up to land on runway 3L; however, the airplane was "fast" on final approach and landed "long." The pilot "stood" on the brakes, the left tire "blew out," and the airplane veered off the left side of the runway. After departing runway 3L, the airplane traveled through the grass, and impacted the asphalt of runway 16, which was raised approximately 7 inches above the ground. When the nose landing gear struck the asphalt, the nose gear collapsed and the airplane came to rest on runway 16. During the accident sequence, the fuselage and wings were substantially damaged. The pilot reported no preimpact mechanical malfunctions or failures with the airplane that would have precluded normal operation. The wind at the airport around the time of the accident was from 140ø true at 7 knots.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC16LA072	09/26/2016	1420 AKD	Regis# N6324V	Anchorage, AK	Apt: Lake Hood LHD
Acft Mk/Mdl HELIO H-250			Acft SN 2538	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-540 SERIES			Acft TT 3099	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CHRISTOPHER R. BRANHAM			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

## Events

1. Landing-landing roll - Part(s) separation from AC

## Narrative

On September 26, 2016, about 1420 Alaska daylight time, a tailwheel-equipped Helio Courier H-250 airplane, N6324V, sustained substantial damage during the landing roll at the Lake Hood Seaplane Base, Anchorage, Alaska. The certificated commercial pilot sustained no injury. The airplane was registered to, and operated by, a private individual as a visual flight rules (VFR) flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91. Visual meteorological conditions prevailed at the time of the accident, and a VFR flight plan had been filed. The flight originated from a private airstrip near Igiugig, Alaska, about 1200.

The pilot reported in a written statement on September 29 that after an uneventful touchdown on the dry and gravel surface of runway 32, a medium vibration was felt as the pilot applied the brakes. As the airplane continued the landing roll, both main landing gear legs sheared off. The propeller impacted the runway, and the airplane came to rest on the bottom of the fuselage without further incident.

The airplane sustained substantial damage to the fuselage. A postaccident inspection revealed that the main landing gear legs on both sides sheared off below a support bracket located at the intersection of the tubular steel structure of the fuselage attachment points. The main landing gear legs (left side, part number 250-040-451-0 and right side, part number 250-040-451-1) are constructed of 1/8-inch steel, which is molded and welded to form a 2-inch-square steel tube. The main landing gear legs are covered by a contoured fairing assembly. The pilot reported that the main landing gear legs were manufactured in 1966. He reported that the main landing gear legs had about 3,500 hours total time, about 15,000 cycles, and 15 hours since the last inspection.

In a written statement on October 14, the pilot reported that he could not determine when the main landing gear was inspected as they were changed in 2013 for ski-wheel use and he was unsure if a dye penetrant process was performed or not. He reported that the main landing gear legs installed on the accident airplane came off another airplane that had about 3,500 hours total time.

The main landing gear legs were secured and transported to the NTSB Materials Laboratory in Washington, D.C., for further examination.

In the recommendation section of the National Transportation Safety Board (NTSB) Accident/Incident Reporting Form 6120.1, the pilot reported that the main landing gear legs may previously have experienced hard landings, along with previous cracks, and that these cracks are difficult to detect during inspection. He further reported that it is advisable to have the main landing gear checked by specialists at annual inspections, especially if the main landing gear is being converted from ski-wheels to wheels, or vice versa.

## METEOROLOGICAL INFORMATION

The closest weather reporting facility was the Lake Hood Seaplane Base. At 1353, an Aviation Routine Weather Report (METAR) was reporting in part: wind from 310 degrees at 5 knots; visibility 10 statute miles; sky condition, overcast 5,500 feet; temperature 46 degrees F; dew point 36 degrees F; altimeter 29.89 inHg.

## TESTS AND RESEARCH

An examination by the NTSB Materials Laboratory revealed that both main landing gear legs were fractured through the square tube section between 29 and 30 inches above the axle centerlines. Several fatigue regions were present in the vertically oriented, aft walls of both main landing gear legs particularly near the upper and lower corners. All fatigue regions initiated at multiple sites on the outer (aft) surfaces of the tube structure and propagated inward (forward) through the wall of the main landing gear legs.

The NTSB Materials Laboratory examination report is in the public docket for this accident.

## ADDITIONAL INFORMATION

### Previous Main Landing Gear Leg Failure

ANC05LA097 identified a fracture failure of the right side main landing gear leg (part number 250-040-451-1, with about 7,006 hours in service) with a Helio H-250 during the landing roll.

### Landing Gear Inspection and Maintenance

The Federal Aviation Administration has published Advisory Circular 43.13-1B Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair (2001). This document discusses inspection and maintenance of landing gear and states in part:

The entire structure of the landing gear should be closely examined for cracks, nicks, cuts, corrosion damage, or any other condition that can cause stress concentrations and eventual failure. Small nicks or cuts can be filed and burnished to a smooth contour, eliminating the point of stress concentration. If a crack is found in a landing gear member, the part must be replaced.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA174	03/05/2017 530 PST	Regis# N2516K	Henderson, NV	Apt: Henderson Executive HND
Acft Mk/Mdl LANCAIR COMPANY COLUMBIA 400		Acft SN 41069	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONT MOTOR TSIO-550-C5		Acft TT 991	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WITTMAN GERALD M		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

2. Landing - Windshear or thunderstorm

## Narrative

The pilot reported that he and his passenger were cleared by tower for the approach to runway 17 Right (R). During landing, "a violent wind gust without warning hit the airplane." The pilot attempted to recover, "when a second violent wind gust hit the airplane causing a wing to hit the ground." The airplane's initial impact point was the left wing that impacted the safety area between runway 17 R and 17 Left (L), and just beyond taxiway Foxtrot. The airplane came to rest in the same safety area about 45ø left of the initial impact point, and about 10 feet from runway 17 L. The airplane sustained substantial damage to runway left wing, the fuselage and the rudder.

The meteorological aerodrome report identified that the wind was out of 220ø at the velocity of 31 kts. gusting to 38 kts. about the time of the accident.

According to the manufacturer's pilot operating handbook, the maximum demonstrated crosswind component is 23 kts.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA477	07/30/2017 1602 EDT	Regis# N304MG	Homestead, FL	Apt: Miami Homestead General Aviati X51
Acft Mk/Mdl LET L 23 SUPER BLANIK-NO		Acft SN 917929	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: N304MG LLC.		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA498	08/21/2017 1344 CDT	Regis# N2861K	Perryville, MO	Apt: Perryville Rgnl PCD
Acft Mk/Mdl LUSCOMBE 8-A		Acft SN 5588	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: RIPPEE, THOMAS E.		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA510 08/19/2017 1400 CDT Regis# N71971 Angleton, TX Apt: Texas Gulf Coast Rgnl LBX  
Acft Mk/Mdl LUSCOMBE 8A-A Acft SN 3398 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: OSCAR W. VICKERY Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN16LA275	07/19/2016 1900 CDT	Regis# N229RS	Huron, SD	Apt: N/a
Acft Mk/Mdl MEYERS 200-B		Acft SN 280	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL IO-550		Acft TT 3487	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BRUCE MAYES		Opr dba:		Aircraft Fire: NONE

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## Events

2. Enroute-climb to cruise - Loss of engine power (partial)

## Narrative

On July 19, 2016, about 1900 central daylight time, a Meyers 200B airplane, N229RS, conducted a forced landing to a field near Huron, South Dakota. The airline transport rated pilot was not injured and passenger received minor injuries. The airplane was substantially damaged during the landing. The airplane was registered to and operated by a private individual, under the provisions of 14 Code of Federal Regulations Part 91 as a cross country flight. Visual meteorological conditions prevailed at the time.

The pilot reported the cross-county flight had an en route stop at the Wendover Airport (KENV), Wendover, Utah, on July 17, 2016. During flight, he noted oil on the windscreen, so he stopped in Casper, Wyoming, for maintenance personnel to look at the airplane. The pilot reported that maintenance personnel identified several discrepancies; the crankshaft seal was leaking, the propeller bolts did not have enough threads showing through the crankshaft flange, the throttle linkage connecting the landing gear warning horn was loose, and the fuel distributor drain fitting did not have an overboard line.

In addition, maintenance personnel also noted that a bolt holding the throttle cable bracket was loose. The bolt was worn and not safetied to the mixture control bolt. Since the maintenance facility did not have an exact replacement bolt, the mechanic selected a bolt, absent holes in the bolt head intended for safety wire. He then drilled a hole in the bolt head for the safety wire, and installed the bolt. The mechanic added that he installed the safety wire through the throttle bolt head, then down to the mixture control bolt.

During the maintenance work, the airplane pilot/owner periodically inspected or observed work as noted by maintenance personnel and security camera footage provided by the maintenance facility. After the accident, the pilot provided the Federal Aviation Administration (FAA) inspector a photo of the throttle linkage area, and the photo confirmed that the safety wire was in place during that maintenance.

On July 19, 2016, after maintenance personnel completed work on the airplane, the pilot started the engine and completed an engine run-up. The pilot then took the airplane on a test flight around the traffic pattern, and after landing, the airplane was checked for leaks.

The pilot and passenger then continued their flight, stopping for fuel about 1830 at the Huron Regional Airport, (KHON), Huron, South Dakota. After departing and reaching an altitude of 2,300 ft, the pilot reduced the throttle, and the engine lost power. The engine then continued to run at idle power. The pilot manipulated the throttle; however, the engine only responded with momentary increases in rpms. Subsequently, the pilot conducted a forced landing in a field, and the airplane came to rest upright. Substantial damage was noted to the airplane's fuselage.

Following the forced landing, the pilot added that after a period of time, he re-entered the airplane to ensure the electrical power and fuel and were off and there was no fire. In addition, he removed the engine cowling and found the throttle linkage was "disconnected or broken."

A post-crash examination of the airplane by an FAA inspector, noted that the bolt holding the throttle cable was missing. This was the bolt that the maintenance personnel reportedly installed with the safety wire earlier that day. The absence of the bolt allowed the throttle cable to "float", meaning, manipulating the throttle control from the cabin, would not govern the engine's throttle position. The throttle bolt was not located. The mixture control bolt was in place; however, the safety wire which ran from the mixture control bolt to the throttle bracket bolt was also missing and not recovered.

The airplane was recovered to the salvage yard located at Beegles Aircraft Service, Greeley, Colorado. During an inspection there, Beegles personnel reported that after removing the top cowling, they found a bolt, laying in a bottom area of the cowling. The bolt; however, had manufactured holes in the head, not new in appearance, and was not the missing bolt.

A review of FAA records revealed that the airplane's original Continental IO-470 engine was replaced with a Continental IO-550 engine under a field approval. The last annual inspection was completed on May 2, 2016, and the airplane had accumulated 10.44 hours, since the annual inspection.





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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA481 07/29/2017 1745 EDT Regis# N2596W Clearwater, FL Apt: St Pete-clearwater Intl PIE  
Acft Mk/Mdl MOONEY M20C-NO SERIES Acft SN 3283 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: ROBERT J. PLASZCZ Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA284	08/20/2017 2055 EDT	Regis# N6833N	Palm Coast, FL	Apt: Flagler Executive FIN
Acft Mk/Mdl MOONEY M20C-NO SERIES		Acft SN 680123	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360 SER			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: MOONEY 6833 NOVEMBER CORP		Opr dba:		Aircraft Fire: IFLT
				AW Cert: STN

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## Events

1. Initial climb - Loss of engine power (total)

## Narrative

On August 20, 2017, about 2055 eastern daylight time, a Mooney M20C, N6833N, was substantially damaged during a forced landing following a total loss of engine power after takeoff from Flagler Executive Airport (FIN), Palm Coast, Florida. The pilot and passenger were not injured. Visual meteorological conditions prevailed and no flight plan was filed for the personal flight to Fort Lauderdale Executive Airport (FXE), Fort Lauderdale, Florida. The airplane was owned and operated by the Mooney 6833 November Corp. under the provisions of 14 Code of Federal Regulations Part 91.

According to the pilot, he and the passenger were flying back to FXE from a flight earlier in the day to St Marys Airport (4J6), St Marys, Georgia. They stopped at FIN for fuel. During the subsequent takeoff, the pilot noticed that the engine did not seem to be producing full power. During the initial climb, he felt the engine continue to lose power and about 400 ft above ground level, the engine lost total power. He told the local air traffic controller that the engine lost all power and was going to land on a road. During touch down, he noticed flames coming into the cockpit around the passenger's feet. He stopped the airplane and both occupants egressed as quickly as possible. The pilot further stated he did not turn off the master switch or boost pump, nor could he get back in the airplane to turn it off as the flames were too intense at that time.

Examination of the wreckage at a salvage yard revealed that the cabin section was consumed by fire. The engine compartment was black from soot but intact. The wings, tail section, and landing gear were intact.

The four-seat, low-wing airplane, was manufactured in 1968. It was powered by a Lycoming O-360 series, 180-horsepower engine, driving a Hartzell two-blade, constant-speed propeller.

The airplane was retained for further examination.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA16FA023	10/24/2015 753 EDT	Regis# N243CW	Worcester, MA	Apt: Worcester Rgnl ORH
Acft Mk/Mdl MOONEY M20M		Acft SN 27-0212	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING TIO-540		Acft TT 2873	Fatal 1 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WELLER GARY L		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

## Summary

The airline transport pilot was departing on a personal local flight in his airplane when the airplane's engine lost total power. Review of airport security video revealed that, after takeoff, the airplane reached an altitude of about 200 ft before turning right and reversing direction. The airplane subsequently stalled, rolled to the right, and descended uncontrolled into trees. It is likely that the pilot reversed direction to return to the airport but failed to maintain adequate airspeed while maneuvering, which resulted in the airplane exceeding its critical angle of attack, an aerodynamic stall, and loss of control. Examination of the engine revealed that the crankshaft had failed due to fatigue cracking between the No. 5 and No. 6 cheeks. The cracking pattern suggested that numerous overstress conditions of relatively short durations acted to initiate the fatigue cracks, but the cause for this overstress could not be determined.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A total loss of engine power during the initial climb due to a fatigue failure of the engine's crankshaft. Contributing to the accident was the pilot's failure to maintain control of the airplane, which resulted in an aerodynamic stall.

## Events

1. Initial climb - Loss of engine power (total)
2. Emergency descent - Loss of control in flight
3. Emergency descent - Aerodynamic stall/spin
4. Uncontrolled descent - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Aircraft-Aircraft power plant-Engine (reciprocating)-Recip engine power section-Failure - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Angle of attack-Not attained/maintained - F
3. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - F

## Narrative

### HISTORY OF FLIGHT

On October 24, 2015, at 0753 eastern daylight time, a Mooney M20M, N243CW, was substantially damaged when it impacted terrain shortly after taking off from Worcester Regional Airport (ORH), Worcester, Massachusetts. The airline transport pilot was fatally injured. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the local personal flight.

There was no radar coverage of the area. Airport security cameras captured partial segments of the flight and showed that the airplane took off from runway 11. One camera showed the airplane in flight, climbing over the intersection of runway 15 about 1,500 ft from the departure end of the 7,000-ft-long takeoff runway. Using the height of the airplane's tail as a reference, the estimated altitude of the airplane was about 80 to 90 ft above the runway surface at that point, climbing in a slight right turn.

The airplane then flew out of view and reappeared about 16 seconds later headed in the roughly the opposite direction of takeoff. Based on the approximate height of the control tower, the airplane appeared to be about 200 ft above the ground in a shallow, climbing right turn. The airplane's nose then began dropping, and the right bank angle increased. The airplane continued to turn to the right in an increasingly nose-down attitude as it descended into a stand of trees.

### PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot held an airline transport pilot certificate with ratings for airplane single- and multi-engine land, as well as a flight engineer certificate. He held an FAA third-class medical certificate, issued July 11, 2014. On the application for this medical certificate, the pilot reported a total flight experience of 7,217 hours. The pilot's logbook was not recovered.

### AIRCRAFT INFORMATION

The four-seat, low-wing airplane was manufactured in 1996. It was powered by a 310-horsepower Lycoming TIO-540 engine and equipped with a three-blade, constant-speed McCauley propeller.

A review of maintenance records revealed that the airplane's most recent annual inspection was completed on April 14, 2015. At that time, the airframe had accumulated 2,872.8 total flight hours.

The engine logbooks could not be located. According to engine manufacturer data, the engine was manufactured in 1993 and returned once to their facility where it was overhauled in December 2001. According to the manufacturer's records, the engine was placed in service on the accident airplane on March 1, 2002. The investigation could not determine if the engine received a subsequent overhaul at another facility. The manufacturer recommended that the engine be overhauled every 2,000 hours or 12 years, whichever occurred first.

## METEOROLOGICAL INFORMATION

The 1154 recorded weather observation at ORH included wind from 350ø at 8 knots, visibility 10 miles, overcast skies at 2,700 ft, temperature 1øC, dew point -3øC, and altimeter 30.39 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

The accident site was located in flat, wooded terrain, and the wreckage was confined to an area extending about 100 ft. There was no wreckage path; the airplane came almost straight down through the trees. There was no evidence of smoke or fire.

The propeller and spinner were found together, separated from the main wreckage, and mostly buried in the ground. The spinner exhibited fore-to-aft crushing, and none of the three propeller blades exhibited evidence typical of engine power at impact.

All flight control surfaces were accounted for at the accident site. The left wing was separated from the fuselage about 4 ft from the wing root, and the right wing was mostly still attached. The left horizontal stabilizer was separated from the airplane, and the right horizontal stabilizer remained attached. Flight control continuity was confirmed from the flight control surfaces to the cockpit.

The engine remained attached to the airframe and was subsequently removed and taken to a maintenance garage for further examination. The starter ring did not exhibit any evidence of powered rotation at impact. The crankshaft was rotated by hand at the flange; it rotated a few revolutions before it jammed and could not be rotated in either direction.

The oil suction screen was removed and found to be contaminated with metal fragments. The accessory case housing was removed, and the No. 5 main bearing was found partially extruded out through the crankshaft gear. Holes were also noted in internal portions of the crankcase halves, and the No. 6 connecting rod was broken.

The engine was subsequently disassembled, and the crankshaft was fractured between the No. 5 and No. 6 cheeks. The camshaft was also broken near the crankshaft fracture, and the interiors of the case halves were gouged rotationally, consistent with the damage having occurred while the engine was still operating.

The engine was sent to the manufacturer's materials laboratory for further investigation. According to the manufacturer's report, the metallurgical examination revealed that the crankshaft failed in fatigue, with crack initiation from the rear fillet radius of the No. 5 crankpin journal, followed by stable fatigue crack growth through nearly the entire section thickness of the No. 8 cheek. Fracture surface markings indicated a likelihood of multiple fatigue crack initiation sites. Multiple origins typically indicate high stress conditions; however, the majority of crack growth through the No. 8 cheek occurred under high-cycle fatigue loading, consistent with relatively lower nominal stress conditions. This cracking pattern suggested that overstress conditions of relatively short duration acted to initiate the fatigue cracks. The report stated that the root cause for this overstress was not determined, but it was not related to any material non-conformance.

The crankshaft conformed to engineering drawing requirements for alloy chemistry, case hardness, case depth, and case and core microstructure. It was slightly below the core hardness specification, but this was not considered relevant for this fracture. Charpy impact test bars cut from the undamaged regions of

the No. 8 cheek were free of any honeycomb or microcrack features, indicating the steel had not been exposed to excessively high temperatures during billet forging or crankshaft forging. The crankshaft journal diameters conformed to engineering specifications. The crankshaft journals also conformed for roundness, except for the No. 1 and No. 3 crankpin journals, which exceeded the specification tolerance for out-of-round; however, these crankpin journals were undamaged.

The JPI 700 engine monitor was sent to the NTSB Records Laboratory for download. Due to internal buffering of the data before being written to non-volatile memory, the final portion of the flight was not recorded. The data that was captured, was from the time of the master avionics switch was turned and, after engine start when the oil, cylinder head, turbine inlet, and exhaust gas temperatures were just starting to climb during warm-up. Then the data showed the temperatures climbing, representing the take-off, and an initial power reduction, before ending abruptly.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Chief Medical Examiner, Commonwealth of Massachusetts, performed an autopsy on the pilot. The cause of death was described as blunt injury. The autopsy also identified mild, focally moderate, atherosclerosis of the coronary arteries, with approximately 40% stenosis of the left anterior descending coronary artery, less than 10% stenosis of the right coronary artery, and no significant stenosis of the left circumflex coronary artery.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from the pilot. The toxicology tests detected no carbon monoxide in blood and no cyanide in blood. The test did detect losartan in the liver and blood. Losartan is approved for use by the FAA and is not considered impairing.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA323	08/12/2017 1117 EDT	Regis# N243CC	Ashland, OH	Apt: Ashland County Airport 3G4
Acft Mk/Mdl NORTH AMERICAN SNJ-4		Acft SN 88-13243	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 1	Flt Conducted Under: FAR 091
Opr Name: PILOT		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

2. Landing-landing roll - Loss of control on ground

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## Narrative

On August 12, 2017, at 1117 eastern daylight time, a North American SNJ-4, N243CC, experienced a bounced landing and veered off runway 19 at Ashland County Airport (3G4), Ashland, Ohio. The airplane nosed-over, impacted terrain, and received substantial damage. The private pilot sustained serious injuries and a passenger sustained minor injuries. The airplane was registered to and operated by the pilot under 14 Code of Federal Regulations Part 91 as a personal flight that was not operating on a flight plan. Visual meteorological conditions prevailed at the time of the accident. The flight originated from Akron Fulton International Airport (AKR), Akron, Ohio, about 1100 and was destined to 3G4.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA506    08/09/2017 1009 PDT    Regis# N6048H    Camas, WA    Apt: Grove Field 1W1  
Acft Mk/Mdl PIPER J3C-65    Acft SN 19194    Acft Dmg: SUBSTANTIAL    Rpt Status: Prelim    Prob Caus: Pending  
Fatal 0    Ser Inj 0    Flt Conducted Under: FAR 091  
Opr Name:    Opr dba:    Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA275	08/13/2017 1700 EDT	Regis# N98550	Salisbury, CT	Apt: N/a
Acft Mk/Mdl PIPER J3C-65		Acft SN 18763	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl CONTINENTAL MOTORS C90-8F			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BERKSHIRE AVIATION ENTERPRISES INC		Opr dba:		Aircraft Fire: NONE AW Cert: STN

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## Events

1. Enroute-cruise - Loss of engine power (total)
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## Narrative

On August 13, 2017, about 1700 eastern daylight time, a Piper J3C-65, N98550, operated by Berkshire Aviation Enterprises Inc., was substantially damaged during a forced landing into trees, following a total loss of engine power in cruise flight near Salisbury, Connecticut. The flight instructor and student pilot incurred minor injuries. The local instructional flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and a visual flight rules flight plan was filed for the flight that departed Walter J Koladza Airport (GBR), Great Barrington, Massachusetts, about 1640.

The flight instructor reported that he was providing an introductory flight to the student pilot in that particular make and model airplane. About 20 miles south of GBR at 2,800 feet mean sea level, the airplane experienced a total loss of engine power. The flight instructor took control of the airplane from the student pilot and positioned the carburetor heat to on. He also verified that the fuel selector was in the on position and the magneto switch was set to both, but the engine did not regain power. There were no suitable landing areas nearby and the flight instructor elected to perform a slow landing into treetops. The airplane subsequently collided with trees and came to rest nose-down entangled in the trees.

The airplane was equipped with a Continental Motors C90, 90-horsepower engine. Examination of the wreckage by a Federal Aviation Administration inspector revealed substantial damage to the wings and fuselage. When the inspector rotated the crankshaft by hand, he was unable to confirm thumb compression to two cylinders or continuity to the rear accessory section.

The engine was retained for further examination.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA281	08/20/2017 1345 EDT	Regis# N46286	Green Creek, NJ	Apt: Paramount JY04
Acft Mk/Mdl PIPER J3C-65		Acft SN G-95	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-290D2			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: PARAMOUNT AIR SERVICE		Opr dba:		Aircraft Fire: NONE

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## Events

1. Approach-VFR pattern downwind - Fuel exhaustion
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## Narrative

On August 20, 2017, about 1345 eastern daylight time, a Piper J3C-65, N46286, was substantially damaged during a forced landing following a loss of engine power while on approach to Paramount Air Strip (JY04), Green Creek, New Jersey. The commercial pilot sustained a minor injury. Visual meteorological conditions prevailed, and no flight plan was filed for the banner-tow flight, which departed JY04 about 0945, and was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to the pilot's written statement and company records, he picked up his first banner at 0948, and subsequently dropped and picked up five more banners. About 1340, he dropped the sixth banner, retracted the tow boom, and entered the downwind leg of the traffic pattern for landing at JY04. At the point where the airplane entered the downwind leg, the engine stopped producing power. The pilot turned the airplane away from a line of trees in the airplane's path, and performed a forced landing to a marsh which resulted in substantial damage to the firewall and fuselage. In a telephone interview with a Federal Aviation Administration (FAA) aviation safety inspector, the pilot reported that he switched fuel tanks and attempted an engine restart during the forced landing, but the attempt was unsuccessful.

The pilot held a commercial pilot certificate with ratings for airplane single engine land, multiengine land, and instrument airplane. His most recent FAA first-class medical certificate was issued October 4, 2016. He reported 650 total hours of flight experience of which 500 hours were in the accident airplane make and model.

The one-place, high-wing airplane was manufactured in 1942 and powered by a Lycoming O-290D2, 135-horsepower engine. It was originally configured with a 12-gallon fuel capacity but was subsequently modified with a 36-gallon fuel system. The most recent annual inspection was completed on August 9, 2016 at 11,517 total aircraft hours.

At 1355, the weather recorded at Cape May County Airport (WWD), 3 miles south of JY04, included clear skies, wind from 290° at 9 knots, and visibility 10 statute miles. The temperature was 26°C, and the dew point was 18°C. The altimeter setting was 30.12 inches of mercury.

The airplane was examined at the scene by an FAA aviation safety inspector. Examination revealed the firewall and the tubular structure of the fuselage were substantially damaged. Flight control continuity was confirmed, and about 1 gallon of fuel was drained from the airplane.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# WPR17LA145	07/08/2017 1045	Regis# N99031	Big Timber, MT	Apt: N/a
Acft Mk/Mdl PIPER L 21B-B		Acft SN 54-2590	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320-A2B		Acft TT 2557	Fatal 0 Ser Inj 2	Flt Conducted Under: FAR 091
Opr Name: BRYANS MACHINE SHOP LLP		Opr dba:		Aircraft Fire: NONE

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## Events

1. Maneuvering-low-alt flying - Miscellaneous/other
2. Maneuvering-low-alt flying - Loss of control in flight

## Narrative

On July 8, 2017, about 1045 mountain daylight time, a Piper L-21B, N99031, was substantially damaged during a wire strike and subsequent impact with the Yellowstone River in Big Timber, Montana. The private pilot and his passenger were seriously injured. The airplane was owned by a private individual and operated by the pilot as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed and no flight plan was filed for the local flight. The flight departed Big Timber Airport (6S0), Big Timber, Montana about 1030.

According to the pilot, he departed the airport to the north with a family member onboard. The pilot then turned east to follow the river and look for his sister who was participating in a water sport. The airplane was about at tree level when it collided with a set of power lines and then immediately impacted the water. The pilot reported to his father that he observed sparks and wires before the airplane entered a nose-down dive.

The 1055 recorded weather observation at 6S0 included wind 220ø true at 11 knots, visibility 10 statute miles, clear skies, temperature 25ø C, dew point 11ø C, and an altimeter setting of 30.20 inches of mercury. According to the U.S. Naval Observatory, the sun azimuth at the time of the accident would have been 116ø.

The airplane came to rest near an eyot approximately 4 nm northeast of 6S0. Photographs from the Federal Aviation Administration revealed that the airplane sustained substantial damage to the wings, empennage, and fuselage.

The pilot reported that the airplane was on a southeast course at the time of the accident. He noted that the sun was on the horizon, but did not obstruct his vision. The pilot further remarked that he was aware of the presence of these power lines from a previous experience flying over the Yellowstone River, several years ago.

A law enforcement representative stated that he observed a broken residential power line near the accident site and that he received reports of a disruption in power service from nearby residents around the time of the accident. The silver colored power line was one of a three phase power configuration that ran between two distribution towers on both sides of the river from a height of approximately 90 feet. The towers were about 4 nm east of the airport.

According to the pilot's father, who is also the 6S0 airport manager, transient pilots frequently fly at low altitudes over this particular portion of the Yellowstone River to avoid turbulent air in the summertime. The airport manager further reported that the power lines were not equipped with aerial marker balls for identification. At the request of the NTSB Investigator-in-Charge, the airport manager agreed to install signage in the local fixed based operator office at 6S0 to caution pilots of the presence of power lines over the Yellowstone River.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA408	07/12/2017	1630 AKD	Regis# N8560C	Denali, AK	Apt: N/a
Acft Mk/Mdl PIPER PA 18			Acft SN 18-2713	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320			Acft TT 5700	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 135
Opr Name: RAY H. ATKINS			Opr dba: RAY ATKINS REGISTERED GUIDE		Aircraft Fire: NONE
					AW Cert: STN

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## Events

1. Landing - Loss of control on ground
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## Narrative

The pilot of the tailwheel-equipped airplane reported that, while landing on the narrow unimproved airstrip in gusty wind conditions, the airplane drifted right of center, and he was unable to recover. Subsequently, the right wing impacted trees off the right side of the unimproved airstrip.

The airplane sustained substantial damage to the right wing and empennage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

An automated weather observation system about 26 nautical miles from the accident site reported, about the time of the accident, the wind from 010ø at 9 knots, gusting to 15 knots.

The pilot reported weather conditions as, good other than gusting wind when entering and in the river valley.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA363	06/24/2017 840 PDT	Regis# N2473P	Pendleton, OR	Apt: Eastern Oregon Rgnl At Pendlet PDT
Acft Mk/Mdl PIPER PA 22-UNDESIGNAT		Acft SN 22-2848	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320-B2B		Acft TT 3389	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: RODNEY L ANDERSON		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The pilot of a tailwheel-equipped airplane reported that, during the landing roll, the right wing lifted about 4 to 5 ft, and the airplane "pivoted on the left landing gear." He added that, once the airplane settled back onto the runway, he applied brakes and the airplane nosed over.

The airplane sustained substantial damage to the fuselage and right wing.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

An automated weather observation station at the accident airport recorded that, about 12 minutes after the accident, the wind was from 210ø at 4 knots. The airplane landed on runway 11.

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## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain directional control during the landing roll with a tailwind.

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## Events

1. Landing-landing roll - Loss of control on ground
2. Landing-landing roll - Nose over/nose down

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## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Tailwind-Effect on operation

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## Narrative

The pilot of a tailwheel-equipped airplane reported that during the landing roll the right wing lifted about 4-5 ft. and the airplane "pivoted on the left landing gear". He added that once the airplane settled back onto the runway he applied brakes and the airplane nosed over.

The airplane sustained substantial damage to the fuselage and right wing.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

An automated weather observation station at the accident airport, about 12 minutes after the accident, recorded that the wind was from 210ø at 4 knots. The airplane landed on runway 11.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA208	06/16/2017 1330 EDT	Regis# N4317Y	Cedar Key, FL	Apt: George T Lewis CDK
Acft Mk/Mdl PIPER PA 23-160-160		Acft SN 23-2041	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
		Acft TT 3291	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: THOMAS MALLORY		Opr dba:		Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA503 08/19/2017 1145 MST Regis# N536CA Mohave, AZ Apt: Sun Valley A20  
Acft Mk/Mdl PIPER PA 28-161 Acft SN 2841024 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: FOLEY JOHN M Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA295 08/25/2017 1030 EDT Regis# N84175 Palatka, FL Apt: Palatka Muni - Lt Kay Larkin F 28J  
Acft Mk/Mdl PIPER PA 28-161-161 Acft SN 288116274 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: Opr dba: Aircraft Fire: GRD

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN17LA010	10/02/2016 1520 CDT	Regis# N5196L	Clarendon, TX	Apt: N/a
Acft Mk/Mdl PIPER PA 28-180-180		Acft SN 28-4486	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360 SER			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: COYOTE FLIGHT		Opr dba:		Aircraft Fire: NONE

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## Events

1. Enroute - Loss of engine power (total)
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## Narrative

On October 2, 2016, about 1520 central daylight time, a Piper PA-28-180 airplane, N5196L, was damaged during a forced landing near Clarendon, Texas. The student rated pilot sustained minor injuries and the airplane was substantially damaged. The airplane was to Tohijoco LLC and operated by Coyote Flight under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight which operated under visual flight rules flight following. The cross-country flight departed the Rick Husband Amarillo International Airport (AMA), Amarillo, Texas, at 1405 and was en route to the Childress Municipal Airport (CDS), Childress, Texas.

The pilot reported to the responding FAA inspector that while in cruise flight the engine lost power and he performed a forced landing to a field. During the landing, the airplane's wings and firewall were damaged.

The airplane was transported to the operator's facility for an examination. The engine was examined under the auspices of an Federal Aviation Administration inspector. The examination noted damage to the engine was consistent with lubrication distress. Further examination of the engine found the metal oil screen pickup fouled with metal. The source of the metal was from a broken piston pin.

During the examination, it was discovered that the engine's oil and oil filter had recently been changed. The oil filter, which had been removed, was examined and metal was found in the filter. A non-mechanic rated person performed preventative maintenance, changed the oil and oil filter prior to the accident. During the oil change, he noticed the metal, but did not consider this to be an indication of a problem.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA189	03/11/2017 1900 MST	Regis# N288PA	Gila Bend, AZ	Apt: Gila Bend Muni E63
Acft Mk/Mdl PIPER PA 28-181		Acft SN 2843502	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360-A4M		Acft TT 16919	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BIRD ACQUISITION LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

2. Takeoff - Collision during takeoff/land

## Narrative

The flight instructor reported that he and two student pilots were on a night, visual flight rules, instructional flight. The instructor tried to activate the pilot controlled lighting at the destination airport, but he believed that it was inoperative. He reported that he could see the wind sock on the airfield but he did not see the "X" near the runway numbers and performed a touch and go. During rotation the instructor reported that, "I heard a red cone make impact with the nose gear section." He had to apply continuous forward pressure to the yoke because the nose continued to pitch up with the trim set to the full down position. He asserted that the flight characteristics were "acceptable" and continued the flight about 47 nautical miles to their home airport. Upon arrival, the instructor alerted tower that he had a stabilator malfunction and landed the airplane with zero flaps. The instructor reported that he did not check the Notices to Airman. The airplane sustained substantial damage to the stabilator.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

According to Federal Aviation Administration NOTAM 03/058, the airport runways were closed at the time of the accident.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA204	06/08/2017 2110 EDT	Regis# N3020M	Gaithersburg, MD	Apt: Montgomery County Airpark GAI
Acft Mk/Mdl PIPER PA 44-180-180		Acft SN 44-7995220	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING LO-360-E1A6D	Acft TT 9467	Fatal 0	Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WASHINGTON INTERNATIONAL FLIGHT ACADEMY	Opr dba:		Aircraft Fire: NONE	AW Cert: STN

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## Events

1. Landing-landing roll - Landing gear collapse

## Narrative

On June 8, 2017, about 2110 eastern daylight time, a Piper PA-44-180, N3020M, was substantially damaged during landing rollout at Montgomery County Airpark (GAI), Gaithersburg, Maryland. The flight instructor and two student pilots were not injured. The instructional flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local flight.

According to the flight instructor, he was returning to home base after a training flight. The flight instructor configured the airplane for landing and briefed the front seated student pilot. The touchdown was uneventful and during the landing roll the airplane began veering to the right of the runway centerline. The airplane came to a full stop and the instructor performed an engine shutdown before exiting the airplane. On inspection of the airplane the flight instructor noted that the right main landing gear was bent backwards towards the aft of the airplane.

Examination of the airplane by a Federal Aviation Administration inspector revealed that the aft right wing spar was damaged during the landing sequence. The airplane was retained for further examination.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ANC17FA049	08/23/2017	2245 AKD	Regis# N1905A	Tyonek, AK	Apt: N/a
Acft Mk/Mdl PIPER PA-18			Acft SN 18-1740	Acft Dmg: DESTROYED	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-290 SERIES				Fatal 1 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: JASON J. WALKUSH			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

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## Events

1. Enroute - Unknown or undetermined

## Narrative

On August 23, 2017, about 2245 Alaska daylight time, a tundra tire-equipped Piper PA-18 airplane, N1905A, was destroyed after impacting remote tree-covered terrain while en route to Merrill Field, Anchorage, Alaska about 31 miles northwest of Tyonek, Alaska. The pilot, the only occupant, died at the scene. The airplane was registered to and operated by the pilot as a 14 Code of Federal Regulations Part 91 visual flight rules personal flight. Dark night, visual meteorological conditions were reported at the Kenai Municipal Airport, Kenai, Alaska about 8 minutes after the accident time, and no flight plan was filed. The Kenai Municipal Airport is located about 44 miles southeast of the accident site.

The flight originated from a remote airstrip in mountainous terrain near Telaquana Lake, located in the Lake Clark National Park and Preserve.

In a conversation with the wife of the pilot on August 28, she reported to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) that the purpose of the flight was for a solo sheep hunting trip. The pilot departed from Merrill Field on August 19 about 1630 and arrived at the remote airstrip about 1930. The wife reported the length of the hunting trip was open ended, with no set return date. On August 23, about 2100 the pilot contacted the wife via a satellite phone and asked her to retrieve various weather information. The wife instructed the pilot to call her back in about 5 minutes and she would provide him the requested weather information. The pilot never called the wife back. About 2220, the wife reported that she received a text message from the pilot stating he was flying over Kenibuna Lake and he should be home around 2300.

Sunset on the day of the accident was 2137; the end of civil twilight was 2227.

About 2245, the U.S. Air Force Alaska Rescue Coordination Center received a 406 MHz emergency locator transmitter (ELT) signal.

On August 24, a U.S. Air Force HH-60G helicopter was dispatched to the 406 MHz ELT coordinates and confirmed the location of the wreckage about 0625, located in remote-tree covered terrain about 1 quarter mile south of the Chakachatna River. On August 24, the NTSB IIC and the Alaska State Troopers traveled to the accident site via helicopter. The wreckage was recovered and transported to a secure facility for future examination of the airframe and engine.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA501 08/17/2017 1300 AKD Regis# N7678D Tyonek, AK Apt: N/a  
Acft Mk/Mdl PIPER PA18-A150 Acft SN 18-5900 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: ELDRIDGE, WILLIAM D. Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA392	07/05/2017 1255 EDT	Regis# N6936B	Berlin, NH	Apt: Berlin Rgnl BML
Acft Mk/Mdl PIPER PA22-150		Acft SN 22-4215	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320 SERIES		Acft TT 2660	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BIRON, MARK C.		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Landing - Loss of control on ground
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## Narrative

The pilot of the tailwheel-equipped airplane reported that, during the landing roll, the airplane veered to the left off the runway. He added that he applied full power and "managed to maneuver the plane out of the ground loop but started taking out runway lights" as he maneuvered the airplane back toward the runway. The airplane impacted a runway light and two taxiway signs, damaging the main landing gear. The airplane then "flew over the runway", landed, and the main landing gear collapsed.

The airplane sustained substantial damage to the fuselage and left wing lift struts.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA16FA186 05/16/2016 1646 EDT Regis# N7031R Homestead, FL Apt: Homestead General Aviation X51  
Acft Mk/Mdl PIPER PA28-140 Acft SN 28-21728 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl LYCOMING O-320-E2A Acft TT 3674 Fatal 0 Ser Inj 1 Flt Conducted Under: FAR 091  
Opr Name: GONZALEZ SANDY C Opr dba: Aircraft Fire: NONE  
AW Cert: STN

## Summary

The private pilot and the passenger, a friend who was previously a student pilot but never completed his training, were making their first flight together. The pilot, who sustained serious injuries, did not recall the accident. The passenger reported that the pilot took off from the departure airport and then transferred the controls to him and let him fly for a while. They flew to another airport, and the pilot made one touch-and-go landing on runway 36. During departure, the pilot again transferred control to the passenger and stated, "you make the next landing and I will watch you."

The passenger reported that he was trying to fly the airplane straight to the runway but drifting left due to a quartering tailwind, which was reported as 14 knots, gusting to 22 knots. The passenger tried to correct the flight path but was unable to align the airplane with the runway centerline. He did not remember if the pilot tried to help or not at any point before the airplane impacted the ground.

The airplane came to rest near midfield and about 340 ft left of the runway edge. Examination of the wreckage did not reveal evidence of any preimpact mechanical malfunctions that would have precluded normal operation. The pilot's (left front seat's) shoulder harness was torn in half at its midpoint. The distal 24 inches (the portion that did not normally retract into the inertia reel) of the webbing showed significant discoloration, fading, and stiffness. A significant section of abrasive wear was noted on the edges of the webbing about 15 to 21 inches from the distal end fitting; the shoulder harness separated in this worn section. The passenger's (right front seat's) shoulder harness was also discolored, faded, and stiff.

The manufacturer's maintenance manual for the airplane stated that an inspection of the seat belts is required during the annual and/or 100-hour inspection. The manual indicated that the belts are to be replaced if deteriorated or worn. Review of the airplane's maintenance logbooks found no records indicating that the seat belts were ever inspected or replaced. If the pilot's shoulder harness had been replaced, it would likely have secured him in his seat and minimized the severity of the injuries that he incurred.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's improper decision to allow the passenger to attempt a landing, which resulted in a loss of control during landing with a quartering tailwind. Contributing to the severity of the pilot's injuries was the separation of the deteriorated shoulder harness.

## Events

1. Landing-flare/touchdown - Loss of control in flight
2. Landing-flare/touchdown - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Passenger - C
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
4. Personnel issues-Experience/knowledge-Experience/qualifications-Qualification/certification-Passenger - C
5. Environmental issues-Conditions/weather/phenomena-Wind-Tailwind-Effect on operation - C
6. Aircraft-Aircraft systems-Equipment/furnishings-Flight compartment equipment-Failure - F

## Narrative

### HISTORY OF FLIGHT

On May 16, 2016, about 1646 eastern daylight time, a Piper PA-28-140, N7031R, impacted terrain during landing at Homestead General Aviation Airport (X51), Homestead, Florida. The airplane sustained substantial damage; the private pilot was seriously injured, and the passenger sustained minor injuries. The airplane was registered to and operated by the pilot as a personal flight conducted 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 Miami Executive Airport (TMB) en route to X51.

The pilot's wife reported that he does not have any recollection of the accident. The passenger stated that the pilot was a friend of his, and the accident flight

was their first flight together. The passenger also stated that he was previously a student pilot but never completed his training and let his medical certificate expire. Soon after departing TMB, the pilot transferred control to passenger and let him fly around and make a couple of turns before he transferred control back to the pilot. They flew to X51, and the pilot made one touch-and-go landing. During departure, the pilot transferred control to the passenger and stated, "you make the next landing and I will watch you."

According to the passenger, the pilot then asked him if he wanted "one notch" of flaps, which equated to 10° flap extension, and the passenger responded that he did. The passenger reported that he was trying to fly the airplane straight to the runway, but it kept drifting left due to the quartering tailwind. The passenger tried to correct the flight path but could not get the airplane aligned with the centerline of runway 36. The passenger further stated that he was having difficulty controlling the airplane and did not remember if the pilot tried to help or not. The passenger recalled the airplane veering to the left of the runway centerline and the ground coming up on them quickly. He then braced for impact.

## PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot held a private pilot certificate with an airplane single-engine land rating, which was issued on May 4, 2012. He also held an FAA third-class medical certificate, issued September 23, 2015. At the time of the medical examination, the pilot reported 2,100 total hours of flight experience. The pilot's logbook could not be located.

According to FAA records, the passenger held a student pilot certificate. He also held an FAA first-class medical certificate, issued December 4, 2014. At the time of the medical examination, the passenger reported no hours of flight experience. The student pilot's logbook could not be located.

## AIRCRAFT INFORMATION

The four-seat, low-wing, fixed-tricycle-gear airplane was manufactured in 1966. It was powered by a 150-horsepower Lycoming O-320-E2A engine and equipped with a two-bladed, fixed-pitch Sensenich propeller.

A review of maintenance records revealed that the airplane's most recent annual inspection was completed on September 20, 2015. At that time, the airframe had accumulated 3,630 total flight hours, and the engine had accumulated 1,453.7 flight hours since major overhaul.

## METEOROLOGICAL INFORMATION

The 1645 recorded weather at X51 was wind from 120° true at 14 knots, gusting to 22 knots, visibility 10 statute miles, temperature 29°C, dew point 23°C, and altimeter setting 30.07 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed that the wreckage was located near midfield and about 340 ft off the left side of runway 36. Ground scars that corresponded with damage to the airplane's left-wing tip were between the runway and a canal. Another ground scar that corresponded to damage to the propeller was located on the far bank of the canal. The ground scars were orientated on a heading of 295°. The airplane came to rest on a heading of 200° about 40 ft from the canal bank. The nose gear was bent aft, and both main landing gear were sheared off.

Cable continuity was established to all flight controls. The left-wing tank was full of fuel, and the right wing tank was half-full of fuel. The fuel was consistent in color and odor to 100LL aviation type gasoline and had no visible signs of water contamination. The nose section of the airplane was crushed down and aft, and the engine was tilted up about 30°. The left wing main spar was fractured at the fuselage, and the rear attachment point bolt separated and was not located within the wreckage area. The left wing pulled away from the fuselage about 6 inches but remained attached to the flap torque tube assembly. The flaps were in the 10° position. The ailerons, fuselage, and right wing were intact. The fuel selector was selected to the left tank. Both control yokes were bent to the right and downward.

The left front seat's (pilot's) shoulder harness was torn in half at its midpoint. The aft attachment points of the pilot's seat remained attached to the seat rails; however, the forward attach points were separated from the seat rails, consistent with impact forces. The right front seat's (passenger's) shoulder harness was intact, and the seat was attached at all four corners to the seat rails.



## Additional Information

The left and right front seatbelts and shoulder harnesses were retained for further examination by an NTSB survival factors specialist. The shoulder harnesses were manufactured by Pacific Scientific, and the lap belts were manufactured by Davis Aircraft Products, Inc. Both shoulder harnesses were equipped with an inertia reel and an end fitting designed to secure to a standoff button on the separate lapbelt, and the belt webbing's total extended length was about 53 inches.

The left shoulder harness webbing retracted normally into the inertia reel. The distal 24 inches (the portion that did not normally retract into the inertia reel) of the webbing showed significant discoloration and fading. The yellowed material in the discolored area was noticeably stiffer and less pliable than the material that retracted into the inertia reel, which appeared to be black in color. Some minor wear was noted on the edges of the webbing that retracted into the inertia reel, and there was a 6-inch section of significant abrasive wear about 15 to 21 inches from the distal end fitting. In this section, about 6 longitudinally woven threads (or 1/8 inch) were compromised at the wear's deepest intrusion into the webbing. A complete transverse, frayed separation of the webbing was present at the point of deepest intrusion, about 20 inches from the distal end fitting.

The webbing of the right shoulder harness did not retract normally into the inertia reel and about 48 inches of webbing remained exposed. The distal 44 inches of the webbing showed discoloration and fading and appeared an orangish color. The discolored material was slightly stiffer and less pliable than the webbing of both lapbelts, but less so than the webbing of the left shoulder harness. The most significant area of discoloration appeared between 14 and 42 inches from the distal end fitting. There was very minor abrasive wear on the edges of a small portion of the webbing that would normally have retracted into the inertia reel, but no thread integrity was compromised. There was no noted wear to the edges of the remainder of the webbing.

Both the lapbelts were in good condition, and the buckles functioned as designed. The webbing was appropriately supple and showed no evidence of fading or damage. The adjustable, insert tab portions of the belts were in similarly good condition. They were adjusted to a length of about 34 inches.

The manufacturer's maintenance manual for the airplane stated that an inspection of the seat belts is required during the annual and/or 100-hour inspection. The manual indicated that the belts are to be replaced if deteriorated or worn. Review of the airplane's maintenance logbooks found no records indicating that the seat belts were ever inspected or replaced.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA419	07/14/2017	813 CDT	Regis# N82629	Fort Worth, TX	Apt: Fort Worth Meacham Intl FTW
Acft Mk/Mdl PIPER PA28-161			Acft SN 28-8216225	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320-D3G			Acft TT 11728	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: K. M. MILOUD			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

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## Events

1. Landing - Abnormal runway contact
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## Narrative

The student pilot reported that, during the final landing of his solo flight, the airplane bounced and he attempted to correct, but the propeller struck the ground. Subsequently, he stopped the airplane and was towed back to the ramp.

The airplane sustained substantial damage to the firewall.

The student pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17LA278	07/07/2017 1551 EDT	Regis# N6653J	Gainsville, GA	Apt: N/a
Acft Mk/Mdl PIPER PA28-180		Acft SN 28-5137	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl LYCOMING O&VO-360 SER			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: WILLIAMS SOL F		Opr dba:		Aircraft Fire: NONE

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## Events

2. Enroute-cruise - Loss of engine power (partial)

## Narrative

On July 7, 2017, about 1551 eastern daylight time, a Piper PA-28-180, N6653J, was substantially damaged during a forced landing in a field about 5 nautical miles southeast of Lee Gilmer Memorial Airport (GVL), Gainesville, Georgia. The private pilot, the sole occupant, was not injured. The airplane was being operated under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed at the time and no flight plan was filed for the flight that was destined for GVL, and originated about 1330 from Hilliard Airpark (01J), Hilliard, Florida.

The pilot stated that about 1545, or when the flight was about 10 miles from GVL, he made a radio call to the airport and gave his location and intentions. He then started the checklist, and when he moved the mixture control, the handle felt like it was caught on something. He pushed harder on the mixture control to move to rich, and then began troubleshooting by moving the mixture control to the point where it had "hung up" to see if it would occur again. At that moment, he heard a "pop" sound followed by engine rpm decrease to idle. He attempted to do a quick check of the quadrant by breaking the sides to get access, but reported the problem was not in the quadrant. By that time, the flight was 7 miles from GVL. He made a mayday call reporting his location, and then executed a right 180° turn and began looking for a place to land, eventually landing in a field.

According to the Federal Aviation Administration inspector who examined the airplane at the accident site the following day, he could not access the cockpit because the cabin entry door was locked. The left fuel tank had about 1/2 capacity, but he could not tell if any fuel remained in the right fuel tank. The airplane was recovered by the pilot. He also indicated that the pilot said the fuel selector was on the left tank position when the engine lost power.

The pilot, who is an airframe and powerplant mechanic with inspection authorization, reported that when he inspected the engine compartment the following day, he found the mixture control cable separated from the mixture control lever at the carburetor.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA345	06/10/2017 1250 EDT	Regis# N9763K	Hartford, CT	Apt: Hartford-brainard HFD
Acft Mk/Mdl PIPER PA28-181		Acft SN 28-7890178	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360-A4M			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CONNECTICUT FLIGHT CLUB		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The pilot reported that, during the landing, the airplane bounced. She added that she attempted to correct, but the propeller struck the runway. The pilot taxied the airplane to the ramp without further incident.

The airplane sustained substantial damage to the firewall.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

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## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's improper landing flare, which resulted in a bounced landing.

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## Events

1. Landing - Hard landing
2. Landing - Abnormal runway contact

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## Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Landing flare-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

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## Narrative

The pilot reported that, during the landing, the airplane bounced. She added that she attempted to correct, but the propeller struck the runway. The pilot taxied the airplane to the ramp without further incident.

The airplane sustained substantial damage to the firewall.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA17CA334 06/09/2017 1000 EDT Regis# N32088 Geneva, OH Apt: Germack 7D9  
Acft Mk/Mdl PIPER PA28R-200 Acft SN 28R-7535023 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl LYCOMING IO-360-C1C Acft TT 4874 Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: DEBORAH A. DOWNEY Opr dba: Aircraft Fire: NONE  
AW Cert: STN

## Summary

The pilot of the airplane reported that, during landing, she added full flaps, and the wind shifted. She applied full power, but the airplane settled, and the left main landing gear touched down on the left edge of the runway. Subsequently, the airplane impacted trees on the left side of the runway.

The airplane sustained substantial damage to both wings.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The pilot reported that the wind was light and variable and that she landed on runway 19. The automated weather observation system about 9 nautical miles from the accident site reported that, about the time of the accident, the wind was from 220° at 7 knots. Additional weather observations from the same site showed that, from 1 hour before the accident until 1 hour after the accident, the wind direction varied from south-southwest to west-northwest, and the speed varied from 6 to 8 knots.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain a proper landing flare in variable wind conditions, which resulted in the airplane landing on the left edge of the runway and impacting trees.

## Events

1. Landing - Loss of control in flight
2. Landing - Attempted remediation/recovery
3. Landing - Abnormal runway contact
4. Landing - Runway excursion
5. Landing - Collision with terr/obj (non-CFIT)
6. Landing - Nose over/nose down

## Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Landing flare-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Sudden wind shift-Effect on operation
4. Environmental issues-Physical environment-Object/animal/substance-Tree(s)-Contributed to outcome

## Narrative

The pilot of the airplane reported that during landing, she added full flaps, and the wind shifted. She applied full power, but the airplane settled, and the left main landing gear touched down on the left edge of the runway. Subsequently, the airplane impacted trees on the left side of the runway.

The airplane sustained substantial damage to both wings.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The pilot reported the wind was light and variable and that she landed on runway 19. The automated weather observation system about 9 nautical miles from the accident site reported, about the time of the accident, the wind was from 220° at 7 knots. Additional weather observations from the same site showed that, from one hour before the accident until one hour after the accident, the wind direction varied from south-southwest to west-northwest, and the speed varied from 6 to 8 knots.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# WPR16FA042 12/22/2015 1127 PST Regis# N323PA Castro Valley, CA Apt: Metropolitan Oakland Intl OAK  
Acft Mk/Mdl PIPER PA32R-301T Acft SN 3257227 Acft Dmg: DESTROYED Rpt Status: Factual Prob Caus: Pending  
Eng Mk/Mdl LYCOMING TIO-540-AH1A Acft TT 1480 Fatal 1 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: SACCO JOHN J Opr dba: Aircraft Fire: GRD  
AW Cert: STN

## Summary

The instrument-rated private pilot was operating the airplane on an instrument flight rules flight in instrument meteorological conditions (IMC). As the airplane neared the destination airport, the controller cleared the pilot for the instrument landing system (ILS) approach, instructed him to descend to 3,400 ft mean sea level (msl), and provided him with a heading to intercept the localizer course. The pilot acknowledged the clearance and began descending the airplane, but did not initiate the turn. About 30 seconds later, the controller again instructed the pilot to turn to intercept the localizer course. The pilot complied, turned west, and began tracking toward the airport south of the localizer course. The controller asked the pilot whether the airplane was established on the localizer, to which the pilot replied, "I'm re-establishing." Shortly thereafter, the controller asked the pilot if he was receiving the glideslope indication for the approach. The pilot confirmed that he was receiving the glideslope, but stated that he was "off glideslope" and "too high." However, at this time, the airplane was 800 ft below the minimum altitude for that segment of the approach (3,400 ft msl). The controller issued a low altitude alert, cancelled the approach clearance, and instructed the pilot to turn north and climb. The pilot acknowledged; however, the airplane turned south and did not climb. The controller again issued the pilot instructions to turn and climb, and the airplane began to turn north and climb before subsequently entering a descent. Shortly thereafter, the pilot stated, "I'm losing it." No further transmissions were received from the pilot, and radar contact was lost in the vicinity of the accident site.

The airplane impacted heavily-wooded terrain about 12 nautical miles southeast of the destination airport, at an elevation about 1,400 ft.

Postaccident examination of the airplane revealed heavy fragmentation consistent with a high-energy impact as well as evidence of a postimpact fire. Examination of the airframe, flight controls, and the engine revealed no evidence of any preimpact mechanical failures or anomalies. Although the extensive damage precluded examination of the primary vacuum pump and functional testing of the autopilot system, it is unlikely these components malfunctioned because before beginning the approach, the pilot experienced no difficulty complying with air traffic control-assigned altitudes and headings, and, throughout the flight, he gave no indication that he was experiencing problems with the flight controls, flight instruments, or autopilot. Based on weather data and the pilot's radio communication that he was "in the weather," the airplane was operating in IMC throughout the approach. When issued instructions to execute a missed approach, the pilot experienced a high workload that involved changes to the airplane's heading, altitude, and likely, configuration; this situation was conducive to the development of spatial disorientation. The pilot likely recognized the onset of spatial disorientation as evidenced by his statement to the controller, "I'm losing it;" however, the pilot was unable to make the appropriate corrective inputs before losing control of the airplane.

## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's loss of control due to spatial disorientation while maneuvering during an instrument approach in instrument meteorological conditions.

## Events

1. Approach-IFR missed approach - Loss of control in flight
2. Approach-IFR missed approach - Collision with terr/obj (non-CFIT)

## Findings - Cause/Factor

1. Personnel issues-Psychological-Perception/orientation/illusion-Spatial disorientation-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-(general)-Not attained/maintained - C
3. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
4. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Below VFR minima-Effect on operation - C

## Narrative

### HISTORY OF FLIGHT

On December 22, 2015, about 1127 Pacific standard time, a Piper PA-32R-301T, N323PA, was destroyed when it impacted terrain near Castro Valley, California, while conducting an instrument approach to Metropolitan Oakland International Airport (OAK), Oakland, California. The private pilot was fatally injured. Instrument meteorological conditions (IMC) were present in the area, and an instrument flight rules (IFR) flight plan was filed for the flight, which departed Lincoln Municipal Airport (LHM), Lincoln, California, about 1050. The airplane was owned and operated by the pilot, and the personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Air traffic control radar and voice communication information from the Federal Aviation Administration (FAA) revealed that the pilot contacted the Northern California Terminal Radar Approach Control facility shortly after takeoff from LHM and requested an IFR clearance to OAK. The pilot was subsequently issued a discrete transponder code and an IFR clearance. About 1122, as the airplane neared the destination, it was established on a heading of 160° at an altitude about 4,000 ft mean sea level (msl). The controller cleared the pilot for the instrument landing system (ILS) approach to runway 28R, instructing him to turn right to a heading of 260° to intercept the localizer course and to descend and maintain an altitude of 3,400 ft msl until established on the approach. The controller told the pilot that the airplane was 1 mile north of the GROVE fix along the approach. According to radar data, at that point, the airplane was 1 mile north of NAGVY, a fix along the approach that was about 3 miles outside of GROVE (see figure 1).

Figure 1 - Approach Overview

The pilot acknowledged the clearance and began descending but did not initiate the right turn. About 30 seconds later, the controller contacted the pilot and provided a heading of 300° to cross and intercept the localizer. The pilot acknowledged, and the airplane began turning right (about 1123; see figure 2). During the turn, the airplane crossed the localizer course, then tracked toward the airport on the south side of the localizer course. About 1124, the controller asked the pilot if he had obtained visual contact with the airport, and the pilot replied, "I'm still in the weather." About 1125, the controller asked the pilot if the airplane was established on the localizer, to which the pilot replied, "I'm re-establishing." When the controller subsequently asked the pilot if he was receiving the glideslope indication, the pilot stated that he was receiving the glideslope but was "off glideslope" and "too high." At this time, the airplane's altitude was 2,600 ft msl; the minimum altitude for that segment of the approach was 3,400 ft msl.

The controller issued a low altitude alert, cancelled the approach clearance, and instructed the pilot to turn right to a heading of 300° and to climb and maintain an altitude of 4,000 ft msl. The pilot acknowledged; however, the airplane began a left turn to the south and did not climb. The controller subsequently instructed the pilot to turn north to a heading of 360° and asked the pilot to verify that the airplane was climbing and turning north. The pilot replied, "360 and climbing." The airplane made a right turn to the north and climbed to 3,700 ft before it began descending. Shortly after, during a partially-blocked transmission, the pilot stated, "I'm losing it." No further transmissions were received from the airplane, and radar contact was subsequently lost.

Figure 2 - Airplane's Flight Path (Localizer Course Depicted in Red)

## PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. He held an FAA third-class medical certificate, which was issued in August 2015 with a limitation requiring the use of corrective lenses. Review of the pilot's logbook indicated that he had accumulated about 1,262 total hours of flight experience, of which about 960 hours were in the accident airplane make and model. The pilot had accumulated about 43 total hours of actual instrument flight experience, 3.5 hours of which were in the 6 months before the accident, and about 82 hours of simulated instrument experience. His most recent flight review and instrument proficiency check were conducted on November 21, 2015.

## AIRPLANE INFORMATION

The airplane was manufactured in 2001 and registered to the pilot in July 2007. It was equipped with a Lycoming TIO-540-AH1A, 300-horsepower, turbocharged, reciprocating engine, which drove a Hartzell HK732B constant-speed propeller. Review of maintenance logs indicated that the airplane's most recent annual inspection was completed on November 17, 2015, at a total airframe and engine time of 1,479.8 hours. The airplane was equipped with Garmin 430 and 530 panel-mounted GPS units, an electrically-driven standby attitude indicator, and a two-axis autopilot system, which interfaced with the airplane's horizontal situation indicator (HSI).

## METEOROLOGICAL INFORMATION

The 1126 automated weather observation at Livermore Municipal Airport (LVK), Livermore, California, located about 8 miles east of the accident site, included wind from 260° at 15 knots, 10 miles visibility, broken cloud layers at 1,300 and 3,200 ft, temperature 15°C, dew point 12°C, and an altimeter setting of 29.82 inches of mercury.

The 1154 automated weather observation at Hayward Executive Airport (HWD), Hayward, California, located about 7 miles west of the accident site, included wind from 270° at 11 knots, 9 miles visibility, broken ceiling at 3,900 ft, overcast ceiling at 5,000 ft, temperature 14°C, dew point 12°C, and an altimeter setting of 29.85 inches of mercury.

A weather computer model balloon sounding for the accident site about 1100 showed clouds likely from the surface through 6,000 ft msl, with drizzle and light rain. Weather satellite information about the time of the accident showed clouds over the area of the accident site moving northwest to southeast. Weather radar animation for the area of the accident site at the time of the accident showed light precipitation.

The area forecast, issued at 0345 and valid through the time of the accident, included overcast ceilings at 1,000 ft above ground level (agl) and visibilities of 3 to 5 miles in light rain and mist.

AIRMET advisories issued between 0645 and 0730, valid for the time of the accident, warned of moderate turbulence below 18,000 ft msl, IMC due to precipitation and mist, and mountain obscuration. Instrument conditions were forecast to improve between 1000 and 1300; however, the mountain obscuration conditions were forecast to continue beyond 1300.

## WRECKAGE AND IMPACT INFORMATION

The accident site was located on a heavily-wooded hillside about 12 nautical miles southeast of OAK at an elevation about 1,400 ft. The initial impact point was identified by several fallen trees and large branches. From the initial impact point, the wreckage path extended downhill about 300 ft on a magnetic heading about 330°. The cockpit and cabin area was largely consumed by a post-crash fire.

The wreckage was recovered to a secure facility for examination due to its heavy fragmentation and the difficult terrain at the accident site. All major components of the airplane were accounted for during reconstruction of the wreckage, and there was no evidence of an inflight breakup.

The cabin and cockpit area, including all flight instruments and the autopilot, were destroyed by impact and fire. The left and right aileron control cables remained attached to the control chain. Both stabilator cables remained attached to the lower stabilator t-bar assembly. The left and right rudder control cables remained attached to the rudder control arm assemblies.

The left and right wings were separated from the fuselage at their respective roots and displayed varying degrees of impact and fire damage. Neither left nor right wing aileron bellcrank stops exhibited indications of flutter, and all control cable separations exhibited signatures of overstress. The fuel selector was in the left tank position, and the filter was free of contaminants. The fuel system was breached in multiple locations. The landing gear down-locks displayed no damage, consistent with the landing gear having been in a retracted position at the time of impact. Measurement of the wing flap actuator threads corresponded to a flaps-retracted position.

The empennage displayed significant impact damage and was separated into several sections. The right side horizontal stabilizer exhibited thermal damage. Both stabilator cables remained attached to the stabilator arm assembly, and the left and right rudder cables remained attached to the rudder bellcrank assembly.

The propeller was separated from the engine at the crankshaft flange. All three propeller blades remained attached at the hub and exhibited varying degrees of torsional twisting and s-bending. The propeller governor remained attached at its mounting pad with the pitch control rod securely attached to the control wheel. The governor was removed for examination; the drive was intact and free to rotate, and the gasket screen was free of contamination.

The engine was separated from its mounts and displayed significant impact damage to the Nos. 1, 3, and 5 cylinders. The No. 1 cylinder rocker assemblies were absent. The No. 3 cylinder head was impact separated, leaving only the barrel in place. The No. 5 cylinder was completely separated from the engine; the piston remained in place. Due to impact damage, the crankshaft could not be rotated by hand. The spark plugs were removed (except for those from the No. 3 cylinder, which were not located), and all displayed normal wear. The Nos. 2, 4, and 6 cylinder rocker covers were removed, and the rocker boxes displayed no



anomalies. The Nos. 2, 4, and 6 cylinder combustion chambers were examined with a borescope and exhibited no anomalies.

Holes were drilled through the engine case to facilitate internal examination of the connecting rods, crankshaft, and camshaft, which revealed no evidence of any preimpact mechanical malfunctions or anomalies.

All accessories were separated from the engine. The accessory case was removed, and the accessory gears, including the crankshaft gear, bolt, and dowel, were intact and undamaged. The left and right magnetos were destroyed. The primary vacuum pump was separated from the engine, and its drive and rotor/vanes were not located. The standby vacuum pump was disassembled for examination and its internal components displayed damage consistent with impact.

The turbocharger system components were displaced from their mountings and exhibited impact damage. There was no evidence of foreign object ingestion. The wastegate remained intact and undamaged. The turbocharger housing exhibited signatures of rotation at the time of impact.

The fuel injection servo was impact separated. The throttle plate and shaft with attached control arm were separated from the servo. The throttle and mixture controls were found securely attached. The fuel inlet screen was free of contamination. The servo was disassembled and no anomalies were noted. The fuel flow divider remained secured to its mounting bracket, but all fuel lines were damaged or separated on impact. The flow divider was disassembled and no anomalies were noted.

The fuel pump was separated from the engine, though a portion of its mounting flange remained attached to the engine. The fuel pump was disassembled, and the rotor and vane assembly remained intact and free to rotate. The diaphragm was torn, and it was retained for further examination.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Alameda County Sheriff's Office Coroner's Bureau, Oakland, California, performed an autopsy on the pilot. The cause of death was listed as blunt force trauma. The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing; tests were negative for ethanol and all tested-for drugs. Carbon monoxide testing could not be performed with the samples available.

## ADDITIONAL INFORMATION

### Fuel Pump Diaphragm

The fuel pump diaphragm was examined at the NTSB Materials Laboratory. Scanning electron microscope imagery of the tear in the diaphragm revealed signatures consistent with tensile overstress as a result of impact forces.

### Spatial Disorientation

The FAA Civil Aeromedical Institute's publication, "Introduction to Aviation Physiology," defines spatial disorientation as a loss of proper bearings or a state of mental confusion as to position, location, or movement relative to the position of the earth. Factors contributing to spatial disorientation include changes in acceleration, flight in IMC, frequent transfer between visual meteorological conditions (VMC) and IMC, and unperceived changes in aircraft attitude. The publication states that pilots flying in IMC are more susceptible than usual to the stresses of flight, such as fatigue and anxiety, and any event that produces an emotional upset is likely to disrupt the pilot's mental processes, making them more vulnerable to illusions and false sensations.

The FAA's Airplane Flying Handbook (FAA-H-8083-3A) describes some hazards associated with flying when the ground or horizon are obscured. The handbook states, in part: "The vestibular sense (motion sensing by the inner ear) in particular tends to confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in the attitude of the airplane, nor can they accurately sense attitude changes that occur at a uniform rate over a period of time. On the other hand, false sensations are often generated; leading the pilot to believe the attitude of the airplane has changed when in fact, it has not. These false sensations result in the pilot experiencing spatial disorientation."

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA349	04/19/2017 1500 CDT	Regis# N4148T	Tulsa, OK	Apt: Richard Lloyd Jones Jr RVS
Acft Mk/Mdl PIPER PA44-180		Acft SN 4496027	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360-A1D			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: SPARTAN EDUCATION LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

The flight instructor of the multiengine airplane reported that, during a simulated single-engine landing, while the pilot receiving instruction was flying, the airplane veered to the left. He added that he took control of the airplane "immediately" and added right rudder to correct, but the airplane exited the runway, and the nose landing gear collapsed.

The airplane sustained substantial damage to the nose landing gear structure.

The flight instructor reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

A review of recorded data from the automated weather observation station at the accident airport reported that, about the time of the accident, the wind was from 180ø at 14 knots, gusting to 21 knots. The airplane landed on runway 19R.

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## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot receiving instruction's failure to maintain directional control during landing in gusting wind conditions.

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## Events

1. Landing-landing roll - Loss of control on ground
2. Landing-landing roll - Runway excursion
3. Landing-landing roll - Landing gear collapse

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## Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Student/instructed pilot - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Gusts-Effect on operation

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## Narrative

The flight instructor of the multi-engine airplane reported that, during a simulated single-engine landing, while the pilot-receiving-instruction was flying, during touchdown the airplane veered to the left. He added that he took control of the airplane "immediately" and added right rudder to correct, but the airplane exited the runway and the nose landing gear collapsed.

The airplane sustained substantial damage to the nose landing gear structure.

The flight instructor reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

A review of recorded data from the automated weather observation station at the accident airport reported that, about the time of the accident, the wind was from 180ø at 14 knots, gusting to 21 knots. The airplane landed on runway 19R.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ERA17CA101	02/06/2017 1550 EST	Regis# N7685H	West Palm Beach, FL	Apt: North Palm Beach F45
Acft Mk/Mdl ROBINSON R22-BETA		Acft SN 3362	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360 SERIES		Acft TT 2594	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CLOUD 9 HELICOPTERS		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Summary

According to the flight instructor, he was conducting an instructional flight in the helicopter and demonstrating low-rotor rpm operations from a hover. The helicopter was at a 3-ft hover when he initiated the maneuver with the student pilot "on the flight controls" following the flight instructor's movements. As the throttle was reduced, the helicopter's nose began to rotate to the left. The flight instructor pushed the right antitorque pedal to counter the rotation, but the pedal initially felt like it was "blocked." The right skid contacted the taxiway, causing the helicopter to bounce and rotate to the right. The flight instructor applied full throttle and collective to attempt to gain altitude; however, the helicopter departed the taxiway, entered an adjacent grass area, and rolled over onto its left side. The helicopter sustained substantial damage to the main rotor and the tailboom. Examination of the flight control system by a Federal Aviation Administration inspector did not reveal any anomalies. In addition, the flight instructor reported there was no preimpact mechanical failures or malfunctions with the helicopter that would have precluded normal operation.

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## Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The flight instructor's failure to maintain helicopter control while demonstrating lowrotor rpm operations from a hover.

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## Events

1. Maneuvering-hover - Loss of control in flight
2. Maneuvering-hover - Collision with terr/obj (non-CFIT)

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## Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Instructor/check pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-(general)-Not attained/maintained - C

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## Narrative

According to the flight instructor, he was conducting an instructional flight in the helicopter and demonstrating low rotor rpm operations from a hover. The helicopter was at a 3 ft hover when he initiated the maneuver, with the student pilot "on the flight controls" following the flight instructor's movements. As the throttle was reduced, the nose of the helicopter began to rotate to the left. The flight instructor pushed the right anti-torque pedal to counter the rotation but the pedal initially felt like it was "blocked." The right skid contacted the taxiway causing the helicopter to bounce and rotate to the right. The flight instructor applied full throttle and collective to attempt to gain altitude; however, the helicopter departed the taxiway, entered an adjacent grass area, and rolled over onto its left side. The helicopter sustained substantial damage to the main rotor and the tail boom. Examination of the flight control system by a Federal Aviation Administration inspector did not reveal any anomalies. In addition, the flight instructor reported there was no preimpact mechanical failures or malfunctions with the helicopter that would have precluded normal operation.

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA509 08/24/2017 1423 PDT Regis# N7198J Bremerton, WA Apt: Bremerton National PWT  
Acft Mk/Mdl ROBINSON HELICOPTER R22 Acft SN 3232 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: EMERALD CITY AIRCRAFT LEASING INC Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ANC17LA013	12/18/2016	1100 AKS	Regis# N121MR	Palmer, AK	Apt: N/a
Acft Mk/Mdl ROBINSON HELICOPTER R22			Acft SN 0496	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-320-B2C			Acft TT 3417	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CASTOR AVIATION LTD			Opr dba:		Aircraft Fire: NONE

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## Events

1. Landing - Loss of control in flight
  2. Landing - Miscellaneous/other
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## Narrative

On December 18, 2016, about 1100 Alaska standard time, a Robinson R-22 Alpha helicopter, N121MR, sustained substantial damage during a collision with mountainous, snow-covered terrain about 12 miles north of Palmer, Alaska. The two occupants aboard, the certificated flight instructor seated in the left seat, and the private helicopter pilot seated in the right seat, sustained minor injuries. The helicopter was registered to, and operated by, Castor Aviation Ltd. of Wasilla, Alaska, as a visual flight rules (VFR) instructional flight under the provision of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed. The flight originated from the Wolf Lake Airport, Palmer, at 1002.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on December 18, the flight instructor stated that he was providing flight instruction to the private pilot who was working towards a commercial helicopter pilot certificate. He added that at the time of the accident, they were practicing pinnacle landings to an area of remote, snow-covered mountainous terrain in the Hatcher Pass Management Area.

The flight instructor said that just before the accident, the private pilot accomplished two successful pinnacle landings to sites situated about 4,200 and 4,600 feet mean sea level (msl). After a third pinnacle landing site was selected, a gravel-covered site on a mountain ridgeline situated about 4,300 feet msl, the private pilot circled the site several times for reconnaissance. He said that while circling, the pair discussed the maneuver, which included a preplanned escape route that was just to the right of the landing site.

The flight instructor said that during the accident approach, while the private pilot was manipulating the flight controls, he confirmed that all cockpit indications were "in the green," no warning lights were illuminated, the manifold pressure was between 20 to 21 inches, and the descent rate was at 150 feet per minute. He reported that as the helicopter neared the site, about 10 to 20 feet above the surface, he realized that it had a steep uphill grade making the site unsuitable for landing. He explained that, as he was getting ready to tell the private pilot to initiate a go-around, the low rotor revolutions per minute (RPM) warning light and horn activated. The private pilot reported that when the low rotor RPM warning light and horn activated, he observed the gauge indicated about 90 percent RPM.

The flight instructor then took control of the helicopter, attempting to maneuver it to the right and towards the predetermined escape route, but it descended and the skids subsequently struck the uneven terrain. He said that after the initial collision, he increased collective pitch and applied right cyclic, but it began to spin to the right, while descending. The helicopter continued to spin, while descending, and it subsequently struck an area of steep, snow-covered terrain. The helicopter then rolled downhill multiple times before coming to rest in an area of steep, snow-covered terrain. Both occupants egressed from the wreckage, a cellular phone was utilized to request rescue assets, and the occupants were extracted from the accident site via a helicopter from a separate operating company.

The helicopter sustained substantial damage to the main rotor system, fuselage, tail boom, and tail rotor system.

The flight instructor reported that there were no preimpact mechanical failures or malfunctions with the airframe or engine that would have precluded normal operation.

In the recommendation section of the NTSB Accident/Incident Reporting Form 6120.1, the flight instructor reported that to never execute a practice approach to an area you are not 100 percent sure you could land the helicopter to in the event of something happening in the last 25 to 50 feet. He further reported that if the landing surface would have been a bit more suitable, the helicopter might have been able to touch down and then come back up to take the planned escape route.

## METEOROLOGICAL INFORMATION

The closest official weather observation station is located at the Palmer Airport, Palmer about 12 miles south of the accident site. At 1053, an Aviation Routine Weather Report (METAR) was reporting, and stated in part: Wind, 20 degrees (true) at 18 knots, gusting 24 knots; visibility, 10 statute miles; clouds and sky condition, scattered clouds at 8000 feet, broken clouds at 14,000 feet; temperature, 34 degrees F; dew point, 14 degrees F; altimeter, 28.86 inHg.

## SURVIVAL ASPECTS

The accident helicopter was not equipped, nor was it required to be equipped with an emergency locator transmitter. The pilot and passenger were not wearing flight helmets for the flight. The helicopter was equipped with 3-point restraint systems for the two seats.

## ADDITIONAL INFORMATION

Robinson Helicopter Company has published the R-22 Pilot's Operating Handbook (2016). This document discusses the low RPM light and horn system and states in part:

The low RPM light and horn indicate rotor RPM at 97 percent or below.

Robinson Helicopter Company has published Safety Notice SN-24 Low RPM Rotor Stall Can Be Fatal (1994). This document discusses main rotor stall and states in part:

Rotor stall due to low RPM causes a very high percentage of helicopter accidents, both fatal and non-fatal. Frequently misunderstood, rotor stall is not to be confused with retreating tip stall which occurs only at high forward speeds when stall occurs over a small portion of the retreating blade tip. Rotor stall, on the other hand, can occur at any airspeed and when it does, the rotor stops producing the lift required to support the helicopter and the aircraft literally falls out of the sky. Fortunately, rotor stall accidents most often occur close to the ground during takeoff or landing and the helicopter falls only four or five feet. The helicopter is wrecked but the occupants survive. However, rotor stall also occurs at higher altitudes and when it happens at heights above 40 or 50 feet above ground level it is most likely to be fatal.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC17LA011	12/02/2016 1200 AKS	Regis# N7085K	Unalaska, AK	Apt: N/a
Acft Mk/Mdl ROBINSON HELICOPTER R22-BETA	Acft SN 2923	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual	Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-360-J2A	Acft TT 3727	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091	
Opr Name: BERING PACIFIC RANCHES LTD.	Opr dba:		Aircraft Fire: NONE	
			AW Cert: STN	

## Events

1. Landing - Loss of visual reference

## Narrative

On December 2, 2016, about 1200 Alaska standard time, a Robinson R-22 Beta helicopter, N7085K, collided with remote snow-covered terrain while landing, about 10 miles southwest of Unalaska, Alaska. The commercial pilot sustained no injury, the passenger sustained minor injuries, and the helicopter sustained substantial damage. The helicopter was registered to, and operated by, Bering Pacific Ranches Ltd., Calgary, Alberta, Canada, as a visual flight rules (VFR) flight under the provisions of 14 Code of Federal Regulations Part 91. Deteriorating visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed. The flight originated from the Unalaska Airport, Unalaska, about 1100.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on December 7, the pilot stated that the purpose of the flight was to transport a telecommunications technician to the Fort Glenn cattle ranch on Umnak Island. After departing from the Unalaska Airport, while flying overwater past Makushin Bay near Cape Starichkof, he observed a snow squall with near zero visibility. The pilot decided to return to Unalaska. On the return trip, while flying in a mountainous valley, a snow squall moved into the area. He stated that due to the deteriorating flight conditions, he conducted a precautionary landing to remote snow-covered terrain to wait for improved flight conditions. Once the snow squall passed, he departed to head back to Unalaska. Several minutes later, he encountered a second snow squall and decided to conduct another precautionary landing. During the precautionary landing sequence, whiteout conditions were present from the main rotor system downwash from the previous snow squall, and the pilot was unable to recognize any topographical features. The main rotor blades impacted terrain and the helicopter rolled onto its left side. Both occupants egressed from the wreckage, a personal locator beacon was activated, and the occupants were extracted from the accident site via a U.S. Coast Guard MH-65D helicopter.

The helicopter sustained substantial damage to the fuselage, main rotor system, tail boom, and tail rotor system.

The pilot reported that there were no preimpact mechanical failures or malfunctions with the airframe or engine that would have precluded normal operation.

## PERSONNEL INFORMATION

In the NTSB Accident/Incident Reporting Form 6120.1, the pilot reported that he held a helicopter instrument rating in addition to instructor ratings for helicopter and instrument helicopter. He additionally reported 70 hours of simulated instrument flight time and no hours were reported for actual instrument flight time.

## AIRCRAFT INFORMATION

The helicopter had no onboard weather capability and it was not instrument flight rules-equipped and certified. The helicopter had a standard skid configuration with no emergency floatation system installed.

## METEOROLOGICAL INFORMATION

The closest official weather observation station is located at the Unalaska Airport, about 10 miles northeast of the accident site. At 1200, an Aviation Routine Weather Report (METAR) was reporting, in part: wind 220ø (true) at 18 knots, gusting 25 knots; visibility 10 statute miles; clouds and sky condition, broken clouds at 1,600 feet; temperature 37ø F; dew point 27ø F; altimeter 30.19 inHg.

## SURVIVAL ASPECTS

The accident helicopter was not equipped, nor was it required to be equipped with an emergency locator transmitter. The pilot and passenger were not wearing flight helmets for the flight. The helicopter was equipped with 3-point restraint systems for the two seats.

## ADDITIONAL INFORMATION

The Naval Research Laboratory has published the Forecaster's Handbook for the Bering Sea, Aleutian Islands, and Gulf of Alaska (1993). This document discusses snowfall and snow cover on the Aleutian Islands and states in part:

During winter, snow frequently covers the ground but the depth of coverage rarely exceeds 1 foot (30 centimeters). High winds, however, cause snow to drift so that depth at an individual location is highly dependent on topography. Some depressions may fill to depths exceeding 6 feet (1.8 meters), and other areas remain relatively free of snow. Because of the relatively mild temperatures, the snow is frequently of the wet, heavy type. Annual rainfall for the islands averages 40 to 50 inches (102 to 152 centimeters), and, again is heavily influenced by topography so that individual locations may have quite different rainfall amounts even though they are separated by only a short distance.



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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA514 08/29/2017 1330 PDT Regis# N622MP Sacramento, CA Apt: Sacramento Executive SAC  
Acft Mk/Mdl ROBINSON HELICOPTER R22-BETA Acft SN 4016 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending  
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091  
Opr Name: CAPITOL HELICOPTERS Opr dba: Aircraft Fire: NONE

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# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# GAA17CA151	02/13/2017 2130 PST	Regis# N4534G	Holtville, CA	Apt: N/a
Acft Mk/Mdl ROBINSON HELICOPTER		Acft SN 2034	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING O-540-F1B5			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137
Opr Name: HAMMOND CHARLIE D		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

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## Events

2. Maneuvering-low-alt flying - Aerodynamic stall/spin

## Narrative

The pilot in the skid-equipped helicopter reported that he had performed an aerial application flight. The helicopter was within 100 pounds of the maximum gross weight at the time of the accident. The helicopter was headed south and the pilot made a left turn to the west and began to settle with power. The pilot noticed the low rotor revolutions per minute (RPM) and the helicopter touched down on the soft dirt surface and rolled over. The helicopter sustained substantial damage to both rotor drive systems, fuselage and tailboom.

In an interview with National Transportation Safety Board investigator-in-charge the pilot stated that the helicopter was about 20 feet above ground level when he noticed the low rotor RPM horn and the airspeed was about 20 knots. He recalled that when he made the left turn, he was operating with a tailwind. He added that the design of the hopper was not approved by the Federal Aviation Administration to be jettisoned.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the helicopter that would have precluded normal operation.

## Additional Information

According to the Federal Aviation Administration (FAA) Helicopter Flying Handbook FAA-8083-21A (HFH) (pg. 2-4, para. 5), turns in a helicopter increase the load factor exponentially, ultimately increasing the power requirement that is necessary to maintain the helicopter's altitude. Left pedal turns increase the quantity of anti-torque produced by the tail rotor, by demanding additional power from the 260-brake horsepower engine. Pilot flight control inputs demanding more power than the engine is capable of producing, with respect to the atmospheric conditions, adversely affects the helicopters ability to sustain its altitude. Available engine power is directly correlated to main and tail rotor RPM.

The FAA Helicopter Flying Handbook FAA-8083-21A (pg. 7-2, para. 5) per the section entitled Factors Affecting Performance:

The wind direction is also an important consideration. Headwinds are the most desirable as they contribute to the greatest increase in performance. Strong crosswinds and tailwinds may require the use of more tail rotor thrust to maintain directional control. This increased tail rotor thrust absorbs power from the engine, which means there is less power available to the main rotor for the production of lift.

The FAA Helicopter Flying Handbook FAA-8083-21A (pg. 2-4, para. 6) entitled Weight, asserts:

To overcome this additional load factor, the helicopter must be able to produce more lift. If excess engine power is not available, the helicopter either descends or has to decelerate in order to maintain the same altitude. The load factor and, hence, apparent gross weight increase is relatively small in banks up to 30°. Even so, under the right set of adverse circumstances, such as high DA, turbulent air, high gross weight, and poor pilot technique, sufficient or excess power may not be available to maintain altitude and airspeed.

The FAA Helicopter Flying Handbook FAA-8083-21A (pg. 2-5, para. 1) entitled Weight, further states:

Regardless of how much weight one can carry or the engine power that it may have, they (helicopters) are all susceptible to aerodynamic overloading. Unfortunately, if the pilot attempts to push the performance envelope the consequence can be fatal. Aerodynamic forces effect every movement in a helicopter, whether it is increasing the collective or a steep bank angle. Anticipating results from a particular maneuver or adjustment of a flight control is not good piloting technique. Instead pilots need to truly understand the capabilities of the helicopter under any and all circumstances and plan to never exceed the flight envelope for any situation.

# National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ANC17FA047	08/22/2017 1100 PDT	Regis# N5022X	Calipatria, CA	Apt: N/a		
Acft Mk/Mdl ROCKWELL INTERNATIONAL S 2R	Acft SN 5054R	Acft Dmg: DESTROYED	Fatal 1	Ser Inj 0	Rpt Status: Prelim	Prob Caus: Pending
Eng Mk/Mdl PRATT & WHITNEY R1340					Flt Conducted Under: FAR 137	
Opr Name: FARM AVIATION INC	Opr dba:				Aircraft Fire: GRD	
					AW Cert: SPR	

## Events

1. Maneuvering-low-alt flying - Unknown or undetermined

## Narrative

On August 22, 2017, about 1100 Pacific daylight time, a Rockwell International S2R agricultural airplane, N5022X, was destroyed when it collided with terrain following a loss of control while maneuvering, about 8.5 miles east of Calipatria, California. The airplane was registered to the Bank of Utah and was being operated by Farm Aviation Inc. as a visual flight rules (VFR) aerial application flight, under 14 Code of Federal Regulations Part 137, when the accident occurred. The certificated commercial pilot, the sole occupant, was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed. The flight originated at an unimproved dirt strip, about 4 miles from the accident location, at about 1050 and was a local flight for aerial application.

According to the owner of Farm Aviation Inc., this was the pilot's second chemical load flight of the day. The first flight originated from Brawley Municipal Airport (KBWC), Brawley, California, about 1020.

According to a witness located about 100 yards from the accident location, the accident airplane completed an agricultural spray pass from west to east. As the airplane approached his position, the airplane began a right turn to turn around and re-enter the spray area. Following a slight right turn, the airplane rolled wings level before what would typically be a left turn back to the field. When the wings were rolled level, at an estimated altitude of between 150 ft above ground level (agl) and 200 ft agl, the nose dropped and the airplane impacted the field in near vertical attitude. A postimpact fire ensued, which incinerated a majority of the airplane's fuselage, left wing, and empennage.

The National Transportation Safety Board (NTSB) investigator-in-charge (IIC), along with another NTSB investigator reached the accident site on the afternoon of August 23. The wreckage was in an alfalfa field at an elevation of about 20 ft below sea level.

Following the initial impact, the fuselage separated from the engine and came to rest about 20 ft north of the engine. The airplane impacted the terrain in a nose-down, near vertical attitude. All of the airplane's major components were located at the wreckage site.

The closest weather reporting facility was the Imperial County Airport (KIPL), about 20 miles southeast of the accident site. At 1053, a METAR from KIPL was reporting, in part: Wind, calm; visibility, 10 statute miles; clouds and sky condition, clear; temperature, 98øF; dew point, 60øF; altimeter, 29.90 inches of mercury.

The airplane was equipped with a Pratt & Whitney R-1340 series engine. A detailed examination is pending.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# CEN16FA304	08/03/2016 1047 CDT	Regis# N1549W	Jeanerette, LA	Apt: N/a
Acft Mk/Mdl SCHWEIZER 269C 1		Acft SN 0219	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl LYCOMING HIO-360-G1A			Fatal 1 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: GULF COAST HELICOPTERS INC		Opr dba: GULF COAST HELICOPTERS INC		Aircraft Fire: NONE
				AW Cert: STN

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## Events

1. Maneuvering-low-alt flying - Loss of control in flight
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## Narrative

### HISTORY OF FLIGHT

On August 3, 2016, about 1047 central daylight time, a Schweizer 269C-1 helicopter, N1549W, was destroyed when it impacted trees in swampy terrain near Jeanerette, Louisiana. The commercial pilot was fatally injured. The flight was being operated by Gulf Coast Helicopters, Inc., as a 14 Code of Federal Regulations Part 91 pipeline patrol flight, and no flight plan had been filed. Day visual meteorological conditions prevailed for the low-altitude cross-country flight. The flight originated from the Louisiana Regional Airport (L38), Gonzales, Louisiana, about 0730 and was destined for the Harry P. Williams Memorial Airport (PTN), Patterson, Louisiana.

The helicopter was completing a scheduled biweekly patrol of a series of intersecting pipelines. When the helicopter failed to arrive at PTN, the operator notified the Federal Aviation Administration (FAA). An alert notice was issued, and a search was initiated. The helicopter wreckage was found the next day partially submerged in the Atchafalaya Basin, a remote, thickly wooded cypress swamp, about 15 miles east of Jeanerette, Louisiana.

### PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with a rotorcraft-helicopter rating. He was not instrument rated although he had logged 5 hours in simulated instrument meteorological conditions. His second-class airman medical certificate, dated April 24, 2015, contained the restriction: "Must wear corrective lenses."

The pilot's logbook was recovered from the submerged wreckage. It contained entries from August 8, 2012, through August 2, 2016. The pilot had successfully completed the practical test for a commercial pilot certificate on March 29, 2015, and according to the FAA, this met the biennial flight review requirements of 61.56 (d). At that time, the pilot had accumulated about 427 hours of flight experience.

According to Gulf Coast Helicopters, the pilot was hired on June 8, 2015. At that time, he had logged a total of about 488 hours of flight experience. The operator reported that most of the pilot's activity in the past year was pipeline patrol with most of that flying about 500 ft above ground level.

Based on a review of the pilot's logbook, his most recent FAA airman medical certification application, information provided by the operator, the helicopter's daily logs, and other records, the pilot's flight experience on August 2, 2016, was estimated to be 1,611 total flight hours, all of which were in helicopters and more than 800 hours of which were in the Schweizer 269. The pilot had logged 1,069 hours in the last 12 months, 225 hours in the last 3 months, 72 hours in the last 30 days, and 8 hours in the last 24 hours.

### AIRCRAFT INFORMATION

The helicopter, serial number 0219, was manufactured by the Schweizer Helicopter Corporation in 2005. It was powered by a Lycoming HIO-360-G1A engine (serial number RL-29952-51E), rated at 180 horsepower. Power from the engine was transmitted through eight drive belts and two drive shafts to the three-bladed main rotor and the two-bladed tail rotor. The helicopter had a gross weight of 1,750 pounds.

According to the maintenance records, the helicopter's last annual inspection was on September 20, 2015, and the last 100-hour inspection was on July 28, 2016, when the helicopter had accrued 5,595.4 flight hours. The engine was remanufactured by Lycoming on March 6, 2013, and it had accrued 4,199.2 flight hours at that time.

### METEOROLOGICAL INFORMATION

The National Weather Service forecast chart indicated that scattered rain showers and thunderstorms were expected over southeastern Louisiana with summer air mass type convection. The surface analysis chart with a satellite composite image overlaid for 1000 depicted a large circular area of enhanced clouds associated with convective clouds or thunderstorms over southeastern Louisiana; the accident site was located adjacent to the eastern edge of this area. The area indicated an anticyclonic or clockwise wind flow. Cloud cover ranged from clear skies over the northern and western portions of Louisiana to overcast skies over the New Orleans area with thunderstorms and rain being depicted in that area. The national composite radar mosaic for 1045 depicted a large area of intense-to-extreme intensity echoes over southeast Louisiana with the strong portion of the echoes between Baton Rouge and New Orleans. Only very light intensity echoes were depicted bordering the accident site eastward.

The closest weather reporting facility was the destination, PTN, located about 18 miles south of the accident site. At 1056, PTN reported visibility 5 miles in moderate rain and mist, a few clouds at 8,000 ft, ceiling overcast at 10,000 ft, and lightning distant northeast, east, and southeast. A thunderstorm began at 0957 and ended at 1019. Another thunderstorm began at 1021 and ended at 1049. Rain began at 1002, ended at 1012, and began again at 1029. Visual flight rules (VFR) to marginal VFR (MVFR) conditions prevailed at the station due to the light rain and broken to overcast cloud layer. The next closest weather reporting facility was Acadiana Regional Airport (ARA), New Iberia, Louisiana, located about 25 miles west of the accident site. At 1053, ARA reported VFR conditions with clear to partly cloudy skies with no thunderstorms reported. The next closest weather reporting location was the departure airport, L38, located about 26 miles north-northeast of the accident site. At 1035, L38 reported thunderstorms with light rain and lightning distant in all quadrants.

At 1045, the Geostationary Operational Environmental Satellite number 13 depicted a large cluster of cumulonimbus clouds over southeast Louisiana with cloud tops near 45,000 ft. The enhanced cloud centers were located northeast through east and southwest of the accident site. The accident site was under the anvil outflow or cirrostratus clouds from the cumulonimbus cloud system. Strong active convection was noted in the system to the east of Baton Rouge and off the Louisiana coast with overshooting cloud tops. The overcast cloud cover over the accident site was associated with high cirriform clouds. Due to the extensive cloud cover, it was not possible to determine if any low clouds were in the immediate vicinity of the accident site.

The accident site was on the border between the forecasts for southwestern and southeastern Louisiana. The forecast for the southwestern portion of the state expected scattered clouds at 3,000 ft, light winds, and no convective activity. The forecast for the southeastern portion expected scattered to broken clouds at 4,000 ft with tops to 14,000 ft with isolated thunderstorms and light rain. The cumulonimbus clouds tops were expected to reach 45,000 ft. The quantitative precipitation forecast indicated a chance of precipitation between 0.01 to 0.10 inches over the accident site.

## WRECKAGE AND IMPACT INFORMATION

The helicopter was partially submerged in the swamp in a nose-down attitude. There was a hole in the overhead trees, consistent with a steep descent. There were also blade strike marks on the tree trunks. The wreckage was recovered and transported to Air Salvage of Dallas, Lancaster, Texas, where it was further examined on August 31, 2016.

The tailboom was intact but separated from the steel tube frame. The main rotor blades were bent and separated. There was impact damage to the aft cabin wall, bulkhead, and forward side of fuel tanks. The seat deck assembly was compressed and folded back toward the aft cabin wall. The aft cabin wall was deformed and pushed aft. The forward sides of both fuel tanks were compressed and deformed, and the aft portions were intact and remained relatively in their original shapes. The mast was intact. The forward bulkhead mount tabs were fractured. The canted horizontal stabilizer was not present. The forward attach fitting remained attached to the tailboom. The lower vertical stabilizer was crushed and deflected to the right with a large rounded dent, which deformed the boom and was oriented about 90° to the longitudinal centerline of the tailboom.

The landing gear was damaged. Neither of the forward skids were present for examination. The left side forward strut was not recovered. All remaining struts and damper attach points exhibited damage consistent with the landing gear assembly being pushed aft. The aft crossbeam was intact and relatively straight. The forward crossbeam was bowed aft in the center section but remained straight in the outer ends. The right hand drag strut was straight and fractured at the aft rod end bearing threads. The left drag strut was bent in the middle nearly 90° with the forward end remaining attached to the crossbeam and aft end to the aft strut.

The yellow and red main rotor blades were bent in a spanwise downward direction. The blue blade separated near the root and exhibited minor downward

bending, trailing edge wrinkles, and peeled upper skin near the tip. The red blade was bent up at the root with tearing and separation, and bent down about 90° midspan and down again about 90° near the tip. The yellow blade was bent down about 90° midspan and down about 30° near the tip. Both tail rotor blades were intact, straight, exhibited only minor damage, and remained attached to the hub. The main rotor head was intact and attached to the drive shaft. The swashplate was intact. The rotating scissors links were intact. The rotor head turned freely in the mast bearing. All three pitch housings remained attached to the main rotor hub. The pitch shaft droop stop lugs were intact and appeared straight. All three pitch housings rotated smoothly, flapped smoothly, and exhibited signs of contact with the upper hub, indicative of full-up flapping motion. All three main rotor dampers were attached at the pitch housings and the blade roots. The pitch change links were intact. The droop stop assembly was intact.

The tail rotor fork and teetering bolt were intact. The assembly teetered properly. The pitch control unit was intact, rotated freely, and slid in and out on the pinion. It was attached to the pitch links, which were straight. The control bell crank was engaged in the pitch control housing and attached to the tail gearbox and the control rod. The tail rotor gearbox remained attached to the tailboom adapter, rotated, and exhibited continuity. The tail rotor drive shaft was bent at the forward bulkhead, and the drive adapter splines were intact. The main gearbox housing was intact, rotated freely, and exhibited continuity. The belt drive assembly was intact and did not exhibit damage. The upper pulley rotated and engaged the overrunning clutch properly. All pulleys were intact, all bearings turned, and the belts were intact. The engine drive shaft was undamaged. There was no evidence of preimpact discrepancies or anomalies with the airframe.

The engine was generally intact. The fuel servo, engine-driven fuel pump, and the right magneto were still attached. Both magnetos were installed on a magneto test bench and rotated up to 2,000 rpm but no sparks were observed. The technician stated that the magnetos were probably not functioning due to internal corrosion caused by water submersion. The spark plugs were removed, and the engine rotated, producing thumb compression on all cylinders. Valve motion was noted on all cylinders. Fuel was found in the servo fuel screen, and no water was present. The electric boost pump was seized; the engine-driven fuel pump operated and pumped liquid; the gascolator was intact with some gas and water present; and the screen was not blocked. The fuel injector and the inlet fuel screen were clear. Fuel injector nozzles 1 and 3 were plugged with a foreign substance. Cylinder nozzle 2 was impact damaged. The remainder of the nozzles were clear and unobstructed. All fuel lines were secure, and the fittings were tight. Fuel and water was observed throughout the engine fuel system. Oil was observed in and around the engine during the engine examination. The oil system was complete and intact with no preimpact defects noted. The oil suction screen was contaminated with carbon deposits and plant material. Nothing was observed during the examination that would have precluded the engine from operating normally before impact.

## MEDICAL AND PATHOLOGICAL INFORMATION

According to the Louisiana Forensic Center's autopsy report, the pilot's cause of death was "blunt force injuries."

According to the toxicology screen performed by the FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, no carbon monoxide or drugs were detected in the pilot's blood. A cyanide test was not performed. The pilot tested positive for ethanol: 71 mg/dL in brain tissue, 60 mg/dL in muscle tissue, and 54 mg/dL in blood. N-butanol was detected in blood, and N-propanol was detected in muscle, brain tissue, and blood. According to the laboratory, the ethanol, N-butanol, and N-propanol were most likely the byproducts of postmortem putrefaction.

# National Transportation Safety Board - Aircraft Accident/Incident Database

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Accident Rpt# ANC16LA035	06/25/2016	1800 AKD	Regis# N9063K	Big Lake, AK	Apt: N/a
Acft Mk/Mdl UNIVERSAL STINSON 108			Acft SN 108-2063	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl CONT MOTOR O 470R				Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: RUSTY KLINE			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

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## Events

1. Enroute-cruise - Loss of engine power (partial)

## Narrative

On June 25, 2016, about 1800 Alaska daylight time, a Stinson 108 airplane, N9063K, sustained substantial damage during a forced landing, following a loss of engine power near Big Lake, AK. The airplane was registered to and operated by the pilot, as a visual flight rules (VFR) flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91 when the accident occurred. Of the three people on board, the certificated private pilot and one passenger sustained minor injuries and one passenger was uninjured. Visual meteorological conditions prevailed, and no flight plan had been filed. The flight departed Merrill Field Airport (PAMR), Anchorage, Alaska, at about 1725.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on June 25, the pilot stated that the purpose of the flight was to take two family members, who were visiting from out of town, on a sightseeing flight. About 35 minutes into the flight, while circling a friend's cabin at about 550 feet above ground level, the engine began to sputter followed by a total loss of engine power. He made a forced landing in an area of densely populated spruce and birch trees. During the forced landing, the airplane sustained substantial damage to wings and fuselage.

On October 12, 2016, the NTSB IIC, along with a Federal Aviation Administration (FAA) safety inspector from the Anchorage Flight Standards District Office examined the airframe and engine at the facilities of Alaska Claims Services, Inc., Wasilla, Alaska.

The propeller remained attached to the engine crankshaft. Both propeller blades exhibited aft bending with minimal torsional "S" twisting.

Examination of the Continental O-470R engine revealed no anomalies, contamination, or evidence of malfunction in any of the engine accessories. The cylinders, pistons, valve train, crankshaft, and other internal components were all without evidence of anomaly or malfunction. The engine was rotated by the propeller. When the engine was rotated, blue spark was observed on the top ignition leads.

Examination of the airplane's wing fuel tanks revealed that the tanks had been modified. An additional section had been welded on to the factory fuel tank with lightening holes drilled in the factory end. Each tank was placarded near the filler cap on the exterior of the wing "FUEL 80/87 MINIMUM GRADE 20 GALLONS." The fuel selector inside the cockpit was placarded "18 GAL." No FAA form 337 (major repair and alteration) or logbook entry was located in the airplane's maintenance records for the modification of the fuel system.

The examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

The closest weather reporting facility was Wasilla Airport, Wasilla, AK, about 19 miles east of the accident site. At 1756, a weather observation from Wasilla Airport was reporting, in part: wind from 080 degrees at 4 knots; visibility, 10 statute miles; clouds and sky condition, few clouds at 4,600 feet, scattered clouds at 5,500 feet, broken clouds at 7,500 feet; temperature, 66øF; dew point 48 øF; altimeter, 29.89 inHG.

After repeated attempts, the pilot did not submit an NTSB Pilot/Operator Accident Report form (NTSB Form 6120.1) as required.