Aviation Investigation Final Report

Location:	Houston, Texas	**Accident Number:**	CEN16FA261
Date & Time:	July 8, 2016, 16:17 Local	**Registration:**	N32KK
Aircraft:	Piper PA 32R-300	**Aircraft Damage:**	Destroyed
Defining Event:	Miscellaneous/other	**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was departing on a cross-country flight in the airplane when the forward baggage compartment door opened shortly before the airplane rotated for liftoff near midfield. The pilot continued the takeoff on runway heading to about 100 ft above ground level before entering a left turn. The airplane continued to turn left until it was on a downwind heading, and then it entered an aerodynamic stall/spin and descended nose-down into terrain. Flight track data revealed that the airplane's ground speed decreased from 84 knots to 1 knot during the final 4 seconds of the flight, consistent with the airplane entering an aerodynamic stall/spin. None of the witnesses reported hearing any engine anomalies during the accident flight.

The postaccident investigation determined that the forward baggage compartment door separated during the airplane's impact with terrain. The door latch mechanism was found unlatched, and its corresponding key-lock assembly was unlocked. No anomalies were found with the forward baggage door latch mechanism, key-lock, or door frame latch catch/receptacle that would have precluded the door from being properly secured before the flight. Based on the witness descriptions and the physical evidence, it is likely that the pilot failed to ensure that the forward baggage compartment door was closed, latched, and properly secured during his preflight inspection. The pilot likely became distracted by the open baggage door and, as a result, did not maintain adequate airspeed while on the downwind leg, which resulted in the airplane exceeding its critical angle of attack and experiencing an aerodynamic stall at a low altitude.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain adequate airspeed after becoming distracted by the open baggage door while operating in the airport traffic pattern, which resulted in the airplane exceeding its critical angle of attack and experiencing an aerodynamic stall at a low altitude. Contributing to the accident was the pilot's failure to ensure that the forward baggage

compartment door was closed, latched, and properly secured during his preflight inspection.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Task monitoring/vigilance - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained
Personnel issues	Preflight inspection - Pilot
Personnel issues	Forgotten action/omission - Pilot
Aircraft	Cargo/baggage doors - Not inspected

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event
Takeoff	Miscellaneous/other (Defining event)
Approach-VFR pattern downwind	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

On July 8, 2016, about 1617 central daylight time, a Piper PA-32R-300 single-engine airplane, N32KK, impacted terrain following a loss of control in the airport traffic pattern shortly after takeoff from the West Houston Airport (IWS), Houston, Texas. The private pilot and three passengers were fatally injured, and the airplane was destroyed. The airplane was registered to and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* (CFR) Part 91 without a flight plan. Day visual meteorological conditions prevailed for the personal cross-country flight that had an intended destination of Gillespie County Airport (T82), Fredericksburg, Texas.

Numerous witnesses observed the airplane during its takeoff from runway 15. Several of the witnesses saw the forward baggage compartment door in a fully open, vertical orientation shortly before the airplane rotated for liftoff. The pilot continued with the takeoff, and the airplane climbed on runway heading to 100 to 150 ft above ground level before it entered a left turn to the crosswind leg. One witness estimated that the left turn began as the airplane crossed over the runway departure threshold. Several witnesses reported that the airplane maintained a bank angle of 30° to 45° during the left turn to the crosswind leg. The airplane continued turning left to the downwind leg and briefly rolled to a wings-level attitude before it entered an aerodynamic stall/spin to the left and descended nose-down into terrain. None of the witnesses reported hearing any engine anomalies during the flight.

The pilot's Apple iPad 4, which was recovered at the accident site, was configured with the ForeFlight application and recorded a tracklog for the flight. The tracklog began about 1613:22 with the airplane on the taxiway. The airplane held short of runway 15 until about 1615:51. About 1616:04, the airplane began its takeoff roll on runway 15. At 1616:27, the airplane became airborne with about 1/2 of the available runway remaining. At 1616:31, at a groundspeed of 74 knots and GPS altitude of 128 ft, the airplane began to deviate left of the runway 15 centerline. The airplane's path followed a left arc with the highest recorded GPS altitude of 179 ft recorded at 1616:53. At 1616:59, the airplane was established on a 349° true heading at a GPS altitude of 139 ft and a recorded groundspeed of 84 knots. Four seconds later, at 1617:03, the airplane had descended to a GPS altitude of 121 ft and decelerated to 1 knot ground speed.

Pilot Information

Certificate:	Private	**Age:**	41,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	April 14, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 5, 2015
Flight Time:	(Estimated) 1350 hours (Total, all aircraft), 72 hours (Total, this make and model)		

According to Federal Aviation Administration (FAA) records, the 41-year-old pilot held a private pilot certificate with single-engine land airplane and instrument airplane ratings. His most recent FAA second-class medical certificate was issued on April 14, 2016, with no limitations or restrictions. On the application for this medical certificate, the pilot reported having accumulated 1,350 total hours of flight experience of which 50 hours were flown within the previous 6 months. A search of FAA records showed no previous accidents, incidents, or enforcement proceedings for the pilot.

The pilot's flight history was established using a recent insurance policy application and airplane use records that were provided by the co-owners of the airplane. According to the insurance application, dated March 28, 2016, the pilot had logged 1,350 hours total flight time, of which 60 hours were in a Piper PA-32R-300, and the pilot's last flight review, as required by 14 *CFR* 61.56, was completed on April 5, 2015. According to airplane use records, the pilot's first recorded flight in the airplane was on February 19, 2015. The records indicated that he had logged 72.1 hours in the airplane. He had flown 41.8 hours during the 12 months before the accident, 15 hours during the 6 months before the accident, and 7.5 hours during the 90 days before the accident. There was no record of the pilot flying the airplane during the 30 days before the accident. According to available information, the pilot did not fly during the 24-hour period before the accident.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N32KK
Model/Series:	PA 32R-300	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7680117
Landing Gear Type:	Retractable - Tricycle	**Seats:**	5
Date/Type of Last Inspection:	June 27, 2016 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4509.5 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91A installed, not activated	**Engine Model/Series:**	IO-540-K1A5D
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The 1976-model-year airplane, serial number 32R-7680117, was a low-wing monoplane of aluminum semi-monocoque construction. The airplane was powered by a 300-horsepower, 6-cylinder, Lycoming IO-540-K1A5D reciprocating engine, serial number L-14027-48A. The engine provided thrust through a constant-speed, two-blade, Hartzell model HC-C2YK-1BF propeller, serial number CH35537B. The five-seat airplane was equipped with a retractable tricycle landing gear and wing flaps. According to the current weight-and-balance record, dated November 30, 2012, the airplane had a useful load of 1,376.75 pounds and a maximum allowable takeoff weight of 3,600 pounds. The airplane was exported to Japan in January 1976 after being manufactured in the United States. The airplane was subsequently imported back into the United States and issued an FAA airworthiness certificate on April 3, 1995. The current owners-of-record purchased and registered the airplane on April 30, 2015.

According to maintenance documentation, the last annual inspection was completed on June 27, 2016, at 4,508.4 hours total airframe and engine time. The recording tachometer indicated 3,124.4 hours at the last annual inspection and 3,125.5 hours at the accident site. At the time of the accident, the airframe and engine had accumulated 4,509.5 since new. The engine had accumulated 465.5 hours since its last overhaul, which was completed on August 9, 2012. The propeller had accumulated 561.5 hours since its last overhaul, which was completed on February 7, 2012. Review of the maintenance records found no history of unresolved airworthiness issues. The airplane had two fuel tanks, one located in each wing, and a total fuel capacity of 98 gallons. A review of fueling records established that the airplane's fuel tanks were topped-off before the flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	TME,166 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	16:15 Local	**Direction from Accident Site:**	266°
Lowest Cloud Condition:	Few / 6000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	35°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houston, TX (IWS)	**Type of Flight Plan Filed:**	None
Destination:	Fredericksburg, TX (T82)	**Type of Clearance:**	None
Departure Time:	16:16 Local	**Type of Airspace:**	Class G

Review of available meteorological data indicated that day visual meteorological conditions prevailed at the accident site. The nearest aviation weather reporting station was located at Houston Executive Airport (TME) about 12 miles west of the accident site. At 1615, about 2 minutes before the accident, the TME automated surface observing system reported: wind 190° magnetic at 11 knots, 10 miles surface visibility, few clouds at 6,000 ft above ground level, temperature 35°C, dew point 23°C, and an altimeter setting of 30.00 inches of mercury.

Airport Information

Airport:	West Houston Airport IWS	**Runway Surface Type:**	Asphalt
Airport Elevation:	111 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	15	**IFR Approach:**	None
Runway Length/Width:	3953 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

West Houston Airport (IWS), a public airport located about 13 miles west of Houston, Texas, was owned and operated by the West Houston Airport Corporation. The airport field elevation was 111 ft mean sea level. The airport had a single asphalt runway, runway 15/33, that was 3,953 ft by 75 ft. The airport was not equipped with an air traffic control tower.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	Unknown
Total Injuries:	4 Fatal	**Latitude, Longitude:**	29.817222,-95.665832

The accident site was in a wooded residential area about 1/2 mile east-northeast of the airport terminal building/ramp. The initial point-of-impact was identified as a 60-ft-tall pine tree that was fractured about 6.5 ft above the ground. A 100 ft wreckage debris path initiated from the pine tree on a 330° true heading. There were numerous broken pine tree branches located along the wreckage debris path. The main wreckage was found upright on a 180° heading and about 42 ft from the initial point-of-impact. The main wreckage consisted of the fuselage (aft of the cockpit), both wings, and the empennage. A majority of the main wreckage had been destroyed by postimpact fire. Flight control cable continuity could not be established due to impact and fire damage; however, all observed separations were consistent with overstress. The mechanical flap control lever was found in the fully retracted position. All three landing gear actuators were fully extended, consistent with an extended landing gear. The fuel selector was found positioned to the right fuel tank.

The cockpit, forward baggage compartment, engine, and propeller were located about 58 ft past the main wreckage. The cockpit instrument panel was destroyed by fire. The landing gear selector switch was found in the DOWN position. The ignition key-switch was found in the BOTH position. The forward baggage compartment exhibited impact and fire damage. The forward baggage compartment door was found about 15 ft from the baggage compartment. The door latch mechanism was observed unlatched, and its corresponding key-lock assembly was unlocked. A functional test of the latch mechanism did not reveal any anomalies. The forward baggage door frame latch catch/receptacle also appeared to be undamaged. There were no observed anomalies with the forward baggage door latch mechanism, key-lock, or the door frame latch catch/receptacle.

The engine remained attached to the firewall, and the propeller remained attached to the crankshaft flange. The two-blade propeller exhibited torsional twisting, trailing edge S-shaped bending, and burnishing of the blade faces and backs. Internal engine and valve train continuity were confirmed as the engine crankshaft was rotated. Compression and suction were noted on all cylinders in conjunction with crankshaft rotation. The single-drive dual-magneto did not provide a spark when rotated; however, the magneto exhibited damage consistent with prolonged exposure to fire. A boroscope inspection did not reveal any anomalies with the cylinders, pistons, valves, or valve seats. The upper spark plugs were removed and exhibited features consistent with normal engine operation. The fuel injection servo remained attached to the engine. There were no obstructions to the fuel injection servo or induction system. The servo fuel inlet screen was free of contamination. No anomalies were observed with the mechanical fuel pump, fuel flow divider, or fuel injectors. The oil pump discharged oil in conjunction with crankshaft rotation. The oil suction screen was free of contamination. The postaccident examination revealed no evidence of a mechanical malfunction or failure that would have precluded normal engine operation.

Medical and Pathological Information

The Harris County Institute of Forensic Sciences, Houston, Texas, performed an autopsy on the pilot. The cause of death was attributed to multiple blunt-force and thermal injuries sustained during the accident.

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology tests on specimens obtained during the autopsy. The pilot's toxicology results were negative for carbon monoxide and ethanol. Cetirizine was detected in urine, but not in blood. The absence of the substance in blood is considered non-impairing. Cetirizine is a potentially-sedating antihistamine available over the counter with a variety of names, including Zyrtec.

Tests and Research

The airplane was equipped with an Electronics International UBG-16 engine monitor and FP-5L fuel computer. The UBG-16 engine monitor displays exhaust gas temperature, cylinder head temperature, and other engine parameters. The FP-5L fuel computer displays instantaneous fuel flow and total fuel usage/remaining information. The UBG-16 and FP-5L were recovered at the accident site and sent to the NTSB Vehicle Recorder Laboratory for examination. Both devices exhibited significant thermal damage that precluded any non-volatile data recovery.

The airplane was also equipped with Electronics International MUX-8A data recorder, which was configured to record various engine data parameters. The device was recovered at the accident site and sent to the NTSB Vehicle Recorder Laboratory for examination. A download of the device revealed no data associated with the accident flight; the last time the device recorded engine data was on June 5, 2015.

Additional Information

The airplane, a 1976 model-year, serial number 32R-7680117, was not equipped with a forward baggage compartment door annunciator. According to the airframe manufacturer, Piper PA-32 series airplanes, beginning with the 1983 model-year, with serial numbers 32-8306001 and higher, were equipped from the factory with a forward baggage compartment door annunciator to alert the pilot of an unsecured baggage door.

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Wilfredo Perez; Federal Aviation Adminstration, Houston FSDO; Houston, TX Damian Galbraith; Piper Aircraft, Inc.; Vero Beach, FL Mark Platt; Lycoming; Chandler, AZ
Original Publish Date:	April 9, 2018
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=93574