Aviation Investigation Final Report

Location:	Santa Fe, New Mexico	**Accident Number:**	CEN18FA192
Date & Time:	May 25, 2018, 13:42 Local	**Registration:**	N79091
Aircraft:	Beech D17S	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The commercial pilot was conducting a cross-country flight in day visual meteorological conditions. Automatic dependent surveillance-broadcast (ADS-B) track data revealed that most of the flight was flown at a cruise altitude of 10,500 ft mean sea level (msl) on a direct course to the planned destination. About 23 minutes before the accident, the airplane began shallow turns to the right and left of a direct course to the destination, consistent with the pilot making manual course corrections as the airplane continued toward the airport. Similarly, the airplane's altitude began to fluctuate ±100 feet from the target cruise altitude of 10,500 ft msl. About 2.5 minutes before the accident, the airplane entered a descent from 10,500 ft msl. During the final 2 minutes of the flight, the airplane had an average descent rate of 1,375 ft per minute and a ground speed between 99 knots and 121 knots. The final ADS-B return was about 385 ft east-northeast of the accident site at 7,025 ft msl (near ground level), and the ground speed was about 106 knots. At no point during the flight did the pilot declare an emergency with air traffic control or report having any problems. There were no witnesses to the accident.

Examination of the airframe and engine revealed no evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation. The airplane's landing gear and flaps were retracted. The fuel tanks ruptured during impact; however, fuel was observed in fuel lines, the engine-driven fuel pump, and the carburetor. The propeller exhibited damage consistent with the engine operating at the time of impact. Autopsy and toxicology of the pilot revealed no evidence of physiological impairment or incapacitation. The reason for the airplane's descent and impact with terrain could not be determined based on the available information.

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 clearance from terrain for reasons that could not be determined based on the available information.

Findings

Aircraft	Altitude - Not attained/maintained
Personnel issues	Monitoring environment - Pilot
Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Enroute-cruise	Controlled flight into terr/obj (CFIT) (Defining event)

On May 25, 2018, about 1342 mountain daylight time, a Beech D17S airplane, N79091, impacted terrain near Santa Fe, New Mexico. The commercial pilot was fatally injured, and the airplane sustained substantial damage. The airplane was registered to Mid Continent Instrument Company Inc. and operated as a Title 14 *Code of Federal Regulations* Part 91 business flight. Day visual meteorological conditions prevailed for the cross-country flight, which departed Perryton/Ochiltree County Airport (PYX), Perryton, Texas, about 1150, with the intended destination of Albuquerque International Sunport Airport (ABQ), Albuquerque, New Mexico.

The operator reported that the pilot departed Wichita, Kansas, earlier in the day and that the pilot landed at PYX for fuel before continuing to ABQ for a planned overnight stop. Fueling documentation from PYX established that the pilot purchased 39.32 gallons of 100 low-lead aviation fuel at 1035. According to automatic dependent surveillance-broadcast (ADS-B) data, the airplane appeared on radar at 1152:28 about 1.5 nautical miles (nm) southwest of PYX. The airplane continued to climb to a cruise altitude of 10,500 ft mean sea level (msl) while maintaining a direct course toward ABQ. The pilot subsequently requested visual flight rules (VFR) flight following with Albuquerque Air Route Traffic Control Center. At 1305:41, the pilot reported that the airplane was in level cruise flight at 10,500 ft msl and the controller replied with the local altimeter setting. There were no additional communications received from the pilot.

The airplane continued in cruise flight at 10,500 ft msl and maintained a direct course toward ABQ. At 1320:00, the airplane began shallow turns to the right and left of the direct course to ABQ. The airplane's altitude also began to fluctuate ±100 feet from its established cruise altitude. At 1340:19, about 2.5 minutes before the accident, the airplane entered a descent from 10,500 ft msl and turned to the west-southwest. During the final 2 minutes of the flight, the airplane had an average descent rate of 1,375 ft per minute and a ground speed between 99 knots and 121 knots. At 1342:50, the final ADS-B return was recorded at 7,025 ft msl about 385 ft east-northeast of the accident site. The airplane's ground speed was about 106 knots. At no point during the flight did the pilot declare an inflight emergency with air traffic control or report having any problems. At 1343:45, the controller began making attempts to contact the pilot over the center frequency without success. An alert notice (ALNOT) was subsequently issued by air traffic control and a United States Air Force search-and-rescue helicopter crew located the wreckage about midnight. There were no reported witnesses to the accident.

Pilot Information

Certificate:	Commercial	**Age:**	53,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	August 24, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 6, 2018
Flight Time:	(Estimated) 4541 hours (Total, all aircraft), 4503.7 hours (Pilot In Command, all aircraft)		

According to Federal Aviation Administration (FAA) records, the 53-year-old pilot held a commercial pilot certificate with airplane single-engine land and instrument airplane ratings. His most recent FAA second-class medical certificate was issued on August 24, 2017, with a limitation for corrective lenses.

The pilot's flight experience was established using his logbook and an airplane utilization log found in the wreckage. The final logbook entry was dated April 22, 2018, at which time he had 4,541 hours total flight experience; all of which was in single-engine airplanes. He had flown 4,503.7 hours as pilot-in-command, 236.1 hours at night, 34.1 hours in actual instrument meteorological conditions, and 62.3 hours in simulated instrument conditions. According to the airplane utilization log, the pilot flew an additional 50.9 hours since his final pilot logbook entry. The pilot had 1,316.7 hours of experience in Beech D17S airplanes. His most recent flight review was completed on March 6, 2018, in a Cessna 172.

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N79091
Model/Series:	D17S D17S	**Aircraft Category:**	Airplane
Year of Manufacture:	1942	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1020
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	December 31, 2017 Annual	**Certified Max Gross Wt.:**	4250 lbs
Time Since Last Inspection:	131 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4960.1 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney
ELT:	C91A installed, activated, aided in locating accident	**Engine Model/Series:**	R-985-AN-14B
Registered Owner:		**Rated Power:**	450 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

The airplane, serial number 1020, manufactured in 1942, was constructed of fabric-covered

steel tube and wood. The airplane was powered by a 450-horsepower, 9-cylinder, Pratt & Whitney R-985-AN-14B reciprocating radial engine, serial number JP-215473. The engine provided thrust through a constant-speed, two-blade, Hamilton Standard 2D30-6167A-15 propeller, serial number B3881. The four-seat airplane was equipped with a retractable conventional landing gear, wing flaps, and had a maximum allowable takeoff weight of 4,250 pounds. According to maintenance documentation, the last annual inspection was completed on December 31, 2017, at 4,828.7 total airframe hours. The airplane had accumulated 131.4 hours since the last annual inspection. The airframe and engine had accumulated a total service time of 4,960.1 hours when the accident occurred. The engine had accumulated 851.1 hours since overhaul on April 24, 2014. A postaccident review of the maintenance records found no history of unresolved airworthiness issues.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	0E0,6204 ft msl	**Distance from Accident Site:**	28 Nautical Miles
Observation Time:	13:35 Local	**Direction from Accident Site:**	227°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.18 inches Hg	**Temperature/Dew Point:**	31°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Perryton, TX (PYX)	**Type of Flight Plan Filed:**	VFR
Destination:	Albuquerque, NM (ABQ)	**Type of Clearance:**	VFR flight following
Departure Time:	12:50 Local	**Type of Airspace:**	Class G

A postaccident review of available meteorological data established that day visual meteorological conditions prevailed at the accident site. The nearest aviation weather reporting station was located at Moriarty Airport (0E0), Moriarty, New Mexico, about 28 miles southwest of the accident site. At 1335, about 7 minutes before the accident, the 0E0 automated surface observing system reported a clear sky, wind from 310° at 4 knots, 10 miles surface visibility, temperature 31°C, dew point -4°C, and an altimeter setting 30.18 inches of mercury.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.293609,-105.581947(est)

An onsite wreckage examination was completed by inspectors with the FAA Albuquerque Flight Standards District Office. The inspectors reported that the airplane impacted several pinon trees before coming to rest in a nose-down attitude. The debris path was oriented on a 233° magnetic heading. The elevation of the accident site was about 7,082 ft mean sea level. The airplane's recording hour meter indicated 1,351.1 hours. Both upper and lower wings sustained impact damage. The left wing was heavily fragmented, and the right wing remained partially attached to the fuselage. The fuselage remained intact with relatively minor damage to the cabin and cockpit. The odor of 100 low-lead aviation fuel was present at the accident site. The airplane's fuel tanks were ruptured during impact; however, there was residual fuel observed in the tanks. The carburetor accelerator pump discharged fuel when the throttle arm was moved. The engine oil supply tank ruptured during impact and there was oil covering the firewall, the aft side of the engine, and portions of the windscreen.

The wreckage was recovered from the accident site to facilitate a more detailed examination. A follow-up examination was completed by investigators with the National Transportation Safety Board (NTSB) and the airframe manufacturer. Flight control cable continuity was established from the individual control surfaces to the cockpit controls through several cable overload separations and cuts made during wreckage recovery. The flap actuator positions were consistent with the flaps being fully retracted at impact. The landing gear was in the fully retracted position. The cockpit fuel selector was positioned to draw fuel from the upper right fuel tank. There were no anomalies noted with the fuel selector valve during a functional test using compressed air. The outflow fuel line from the fuel selector valve contained residual fuel. The engine-driven fuel pump rotated by hand and discharged a fluid that had an odor consistent with 100 low-lead aviation fuel.

The engine crankshaft was rotated by applying electrical power to the starter motor. Internal engine and valve train continuity were confirmed as the engine crankshaft was rotated. Apart from engine cylinders Nos. 5 and 6, compression and suction were noted on all cylinders as the crankshaft was rotated. The No. 5 cylinder exhibited impact-related damage to the valve push rods that precluded normal valve movement. The entire No. 6 cylinder head had separated from the cylinder barrel. Several fragments of the No. 6 cylinder head, including the intake and exhaust valves, were recovered along the wreckage debris path at the accident site. Both magnetos provided spark while the engine crankshaft was rotated. The spark plugs were removed and exhibited features consistent with normal engine operation. The No. 6 cylinder barrel was removed to examine the internal engine components. There was ample engine oil observed throughout the engine and there was no evidence of oil starvation on the drivetrain components. The two-bladed propeller exhibited chordwise scratches and leading-edge damage on both blades. One propeller blade exhibited a S-shape bend and the other propeller was bent aft midspan. Examination of the airplane and engine did not reveal any evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation.

The recovered portions of the No. 6 cylinder head, cylinder barrel, piston, pushrod, and manifold tubes were submitted to the NTSB Materials Laboratory. The No. 6 cylinder head had separated from the barrel and was fractured into multiple pieces with about 1/4 of the cylinder head base missing. The fracture surfaces exhibited a rough appearance without any tinting or discoloration. The observed features were consistent with overstress fractures. Both the intake and exhaust valves were present and exhibited features consistent with normal operation. There were no notable features on the cylinder barrel or the piston. The pushrod assembly and manifold tubes exhibited deformation consistent with impact damage.

Two GoPro Hero6 cameras were recovered at the accident site. The first camera exhibited significant impact damage and did not contain a MicroSD memory card or a battery. The second camera was undamaged and contained both a MicroSD memory card and a battery. The memory card contained 19 photos and 2 videos that were recorded during the flight. The camera footage was from inside the cockpit facing forward, and depicted the instrument panel and the view ahead of the airplane's position. The first video was recorded at 12:35:04 and was about 0.9 seconds in duration. The second video was recorded at 12:53:52 and was about 5.9 seconds in duration. Neither video contained any pertinent details useful to the investigation. The 19 photos were recorded between 12:24:56 and 12:43:57. The photos depicted the airplane's position from the intended destination (ABQ) on the Garmin GTN750 multifunction display. The airplane's position from ABQ was 227 nm and 184 nm at 12:24:56 and 12:43:57, respectively. The camera did not contain any additional footage of the flight.

An Apple iPhone 6, a Samsung Galaxy S7, and an Apple iPad were also recovered from the wreckage. The Apple iPhone 6 was protected by a 6-digit passcode, which precluded access to the contents of the phone during the investigation. The Samsung Galaxy S7 was not passcode protected; however, it did not contain any pertinent details useful to the investigation. The Apple iPad exhibited significant impact damage which precluded the device from being powered-on and examined.

Medical and Pathological Information

The New Mexico Office of the Medical Investigator in Albuquerque, New Mexico, performed an autopsy on the pilot that attributed the cause of death to multiple blunt-force injuries.

Toxicology testing performed at the FAA Forensic Sciences Laboratory was negative for ethanol, carbon monoxide, and all tested drugs and medications.

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Gary Medina; Federal Aviation Administration - ABQ FSDO; Albuquerque, NM Raymond Romero; Federal Aviation Administration - ABQ FSDO; Albuquerque, NM Ricardo Asensio; Textron Aviation; Wichita, KS
Original Publish Date:	April 13, 2020
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97327