



National Transportation Safety Board Aviation Accident Final Report

Location:	Taylor, TX	Accident Number:	CEN16FA146
Date & Time:	04/09/2016, 0951 CDT	Registration:	N690TH
Aircraft:	ROCKWELL 690B	Aircraft Damage:	Destroyed
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Instructional		

Analysis

The private pilot, who was the owner of the airplane, and a flight instructor were performing a recurrent training flight. Radar data showed that the airplane departed and climbed to an altitude about 5,000 ft above ground level. About 5 minutes after takeoff, the airplane conducted a left 360° turn followed by a right 360° turn, then continued in level flight for about 2 minutes as it slowed to a groundspeed of about 90 knots, which may have been indicative of airwork leading to slow flight or stall maneuvers. The airplane then entered a steep bank and impacted the ground in a nose-low attitude. Both engines and propellers displayed evidence of operation at the time of impact, and postaccident examination revealed no mechanical anomalies that would have precluded normal operation of the airframe or engines.

The instructor had a history of obstructive sleep apnea. The investigation was unable to determine how well the condition was controlled, if he had symptoms from the condition, or if it contributed to the accident. Toxicology testing revealed low levels of ethanol in specimens from both pilots; however, it is likely that some or all of the ethanol detected was a result of postmortem production, and it is unlikely that alcohol impairment contributed to the accident. Toxicology testing also detected the primary psychoactive compound of marijuana, tetrahydrocannabinol (THC), and its metabolite, tetrahydrocannabinol carboxylic acid (THC-COOH), in specimens obtained from comingled remains; the investigation was unable to reliably determine which pilot had used the impairing illicit drug. Additionally, it is not possible to determine impairment from tissue specimens; therefore, the investigation was unable to determine whether THC impaired either of the pilots or if it may have contributed to the accident.

Probable Cause and Findings

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

A loss of control while maneuvering for reasons that could not be determined because postaccident examination did not reveal any mechanical malfunctions or anomalies with the airplane.

Findings

Aircraft	Performance/control parameters - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Aircraft control - Instructor/check pilot (Cause)
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

History of Flight

Maneuvering	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On April 9, 2016, at 0951 central daylight time, a Rockwell International 690B, N690TH, was destroyed when it impacted terrain while maneuvering near Taylor, Texas. The private pilot and flight instructor were fatally injured. The airplane was privately owned and operated under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the local instructional flight, which departed from Georgetown Municipal Airport (GTU), Georgetown, Texas, at 0941.

An acquaintance of the pilot stated that the purpose of the accident flight was for the pilot to conduct annual recurrent training to meet insurance requirements. He stated that, as the pilot and instructor were conducting a walkaround of the airplane before the flight, he heard the instructor telling the pilot that they were going to perform "air work" at an altitude of 4,000 - 5,000 ft, followed by instrument approaches. The acquaintance thought that an altitude of 4,000-5,000 ft to perform air work was low and that it should be at least 10,000 ft.

Radar data showed that the airplane departed GTU and proceeded east as it climbed to an altitude about 5,500 ft mean sea level (5,000 feet above ground level). About 5 minutes after takeoff, the airplane completed one 360° turn to the left followed by one 360° turn to the right. The airplane then resumed its easterly course in level flight for about 2 minutes, during which it slowed to a ground speed of 90 knots before rapidly descending.

A witness near the accident site stated that the airplane entered a turn at low altitude and then went "totally sideways" and "started coming down" as if it was performing "tricks." She said that the left wing of the airplane was pointed to the sky and the right wing was pointed to the ground. She described the engine speed as "slow" and stated that the sound did not change as the airplane maneuvered before impact. She said the airplane descended with the nose pointing straight down toward the ground.

Pilot Information

Certificate:	Private	Age:	54, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With Waivers/Limitations	Last FAA Medical Exam:	07/07/2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	05/16/2015
Flight Time:	1351 hours (Total, all aircraft), 65 hours (Total, this make and model), 1177 hours (Pilot In Command, all aircraft), 33 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft)		

Flight Instructor Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	66, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Right
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Helicopter; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	11/05/2015
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	25975 hours (Total, all aircraft)		

The airplane was registered to the pilot on April 23, 2015. The pilot received dual flight instruction in the accident airplane from April 13 to May 25, 2015. The total flight instruction during this period was 34.2 hours. A logbook endorsement, dated May 15, 2015, showed that he completed a flight review, a pilot-in-command landing proficiency, and an instrument competency check.

The 54-year-old pilot held a Federal Aviation Administration (FAA) third-class medical certificate. The 66-year-old instructor held an FAA second-class medical certificate.

Aircraft and Owner/Operator Information

Aircraft Make:	ROCKWELL	Registration:	N690TH
Model/Series:	690B	Aircraft Category:	Airplane
Year of Manufacture:	1978	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	11487
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:	04/06/2016, Continuous Airworthiness	Certified Max Gross Wt.:	10375 lbs
Time Since Last Inspection:		Engines:	2 Turbo Prop
Airframe Total Time:	9002.5 Hours as of last inspection	Engine Manufacturer:	Honeywell
ELT:		Engine Model/Series:	TPE331-10T-51
Registered Owner:	Pilot	Rated Power:	776 hp
Operator:	Pilot	Operating Certificate(s) Held:	None

According to the Model 690B Pilot's Operating Handbook, Section II, Limitations, the airplane's stall speed with landing gear and flaps retracted at gross weight (Vs) was 78 knots indicated airspeed (KIAS), and its minimum controllable airspeed (Vmca) was 83 KIAS.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	GTU, 790 ft msl	Distance from Accident Site:	20 Nautical Miles
Observation Time:	0950 CDT	Direction from Accident Site:	268°
Lowest Cloud Condition:	Few / 2900 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 11000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30.16 inches Hg	Temperature/Dew Point:	17°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Georgetown, TX (GTU)	Type of Flight Plan Filed:	None
Destination:	Georgetown, TX (GTU)	Type of Clearance:	Traffic Advisory
Departure Time:	0941 CDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	30.686389, -97.292222

The airplane came to rest upright in a field oriented on a magnetic heading about 130° and was consumed by postcrash fire. The empennage was folded forward, and the left and right wing leading edges were crushed aft. The flap control mechanism was in a position consistent with flaps up. The elevator trim tab was about 16.4° down (nose-up). The flight control system exhibited separations consistent with overload throughout. The airplane's nose, forward fuselage, both engines, and propellers were embedded about 3 ft into the ground. Both propellers exhibited S-shaped bending, twisting, and chordwise scratching. The left and right propeller pistons had circumferential signatures consistent with blades angles about 18.6° and 15.5°, respectively.

The left engine throttle control was in the forward position, and the right engine throttle control was in about the mid-position. The left engine condition lever was broken off, and the right engine condition lever was in the forward position.

Examination of both left and right engines revealed extensive impact damage; neither engine could be rotated by hand. Both engines displayed bending of the first stage impeller blades in the direction opposite of impeller rotation, and debris in the first stage of the compressor consistent with impact with the ground. Both engines had metal deposits on the turbine rotors and stators, consistent with engine operation at the time of impact. Examination revealed no mechanical anomalies that would have precluded normal operation.

Medical And Pathological Information

According to medical records, the pilot had high blood pressure treated with the non-impairing blood pressure medication valsartan.

Central Texas Autopsy PLLC, Lockhart, Texas, performed an autopsy on the pilot. The cause of death was listed as multiple blunt force injuries; however, the autopsy was limited to an external examination due to the extent of the injuries and was unable to identify any significant natural disease. NMS Labs' toxicology analysis, conducted as part of the autopsy, detected caffeine (a mild stimulant found in coffee and tea), acetaminophen (a non-narcotic pain and fever medication often marketed as Tylenol) and ethanol (a central nervous system depressant

found in beer and wine but also produced after death by decomposition) in muscle. The toxicologist commented: "The ethyl alcohol concentration increased from 45 to 78 mg/100 g of muscle over multiple analyses. The nature of the specimen and/or the container type, which may not contain preservative, may explain the variable quantitative results. Small amounts of ethanol may also be produced by decomposition of the tissue."

According to medical records, the flight instructor had high blood pressure treated with the non-impairing blood pressure medication metoprolol and obstructive sleep apnea treated with a CPAP device.

Central Texas Autopsy PLLC conducted an autopsy on the instructor and listed the cause of death as multiple blunt force injuries; however, the autopsy was limited to an external examination due to the extent of the injuries and was unable to identify any significant natural disease. NMS Labs' toxicology analysis, conducted as part of the autopsy, detected acetaminophen (a non-narcotic pain and fever medication often marketed as Tylenol), beta-phenethylamine (a product of tissue decomposition) and a non-quantified amount of ethanol in muscle tissue. The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from comingled remains, and the investigation was unable to reliably determine which specimen came from which individual. Testing of specimens attributed to the pilot documented that valsartan was not detected in muscle or lung and ethanol was not detected in muscle or liver. However, testing of specimens attributed to the pilot detected the primary psychoactive compound of marijuana, tetrahydrocannabinol (THC), at 35.2 ng/g in liver, at 52.9 ng/g in lung, and identified a non-quantified amount in muscle. THC's inactive metabolite, tetrahydrocannabinol carboxylic acid (THC-COOH), was detected at 50.4 ng/g in liver, 18.8 ng/g in lung, and a non-quantified amount was detected in muscle. Additionally, testing of specimens attributed to the instructor pilot documented ethanol at 20 mg/dl in liver and heart; dextromethorphan (a cough suppressant) in liver, kidney and muscle; and valsartan (a blood pressure medication) in liver but not muscle. The report stated that THC and THC-COOH were not detected in muscle attributed to the instructor. Dextromethorphan is generally not considered impairing at therapeutic levels.

Administrative Information

Investigator In Charge (IIC):	Mitchell F Gallo	Report Date:	02/22/2018
Additional Participating Persons:	Frank Fortmann; Federal Aviation Administration; San Antonio, TX Geoffrey Pence; Twin Commander Aircraft LLC; Creedmoor, NC Les Doud; Hartzell Propeller; Piqua, OH Dana Metz; Honeywell Aerospace; Phoenix, AZ		
Publish Date:	02/22/2018		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92980		

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

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