Aviation Investigation Final Report

Location:	Pacoima, California	**Accident Number:**	WPR18FA249
Date & Time:	September 3, 2018, 17:10 Local	**Registration:**	N10789
Aircraft:	Cessna 150L	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The flight instructor and passenger were conducting a local area discovery flight. About 50 seconds after the airplane was cleared for takeoff, the instructor transmitted to the tower controller, that he needed to turn back. The tower controller then cleared the airplane to land; no further communication was received from the instructor.

A video recording from a GoPro camera mounted in the cockpit provided an over-the-shoulder view of the airplane occupants and instrument panel during the flight; there was no audio. The video revealed that, after an uneventful taxi and run-up, the instructor taxied the airplane onto the runway and, with his hands still on the yoke, the passenger advanced the throttle to start the takeoff roll. The airplane became airborne, and about 20 ft above ground level (agl), the instructor removed his hands from the yoke to allow the passenger to fly. Two seconds later, the airplane's nose dropped, and the instructor put his right hand on the yoke and left hand on the throttle; the rpm gauge indicated between 2,200 and 2,300 rpm. The instructor then appeared to verify that the throttle was at full power and that the mixture was full rich. When the airplane was about 50 ft agl, the instructor quickly pulled back the throttle, and the rpm dropped to 1,300. He then increased the throttle to full power, and the rpm increased to 2,200 rpm. The instructor then initiated a left bank turn, and the airplane subsequently pitched up and banked left about 15° to 20°. The airspeed began to slow, and the ball in the turn-and-slip indicator showed an almost full-right deflection. The instructor continued to pull the yoke aft as the airspeed continued to decrease throughout the turn. The airplane subsequently entered a left spin from about 50 ft agl, turned about 270°, and then impacted the overhang of a building about 500 ft adjacent to the departure end of the runway.

Witnesses reported seeing the airplane shortly after takeoff. One witness reported that the engine sounded abnormal, "like it was sputtering." Another witness reported seeing the airplane "at a very low altitude" and descending rapidly and the wings "dipping side to side." Subsequently, the airplane rolled 180° and descended nose down. Another witness reported seeing the airplane enter a left spiraling turn.

The witnesses went to the wreckage site and reported that no fuel was leaking from the airplane; another witness confirmed that there was no fuel leakage or smell of aviation fuel.

Postaccident examinations of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. The fuel tanks exhibited crushing damage; however, they were not breached. Less than 1 gallon of aviation fuel was recovered from both wing fuel tanks. Each fuel tank can hold 13 gallons of fuel, of which 1.75 gallons is unusable.

According to a refueling record, 15.70 gallons of fuel were added to the airplane 2 days before the accident, however the student present when fuel was added to the airplane was unsure how much was added or present in the fuel tanks. Immediately after refueling, the student flew with the accident instructor for 1.5 hours practicing touch-and-go landings. According to the airplane's operator, the accident instructor also flew two 30-minute-long discovery flights in the accident airplane after the last fueling.

The passenger on board did not provide a statement as to the events leading up to the accident, nor if the flight instructor accomplished a preflight inspection, to include checking the fuel quantity. Given the amount of fuel recovered from the wreckage, it is likely that the flight instructor did not check the fuel quantity before the flight, and the loss of engine power was due to fuel exhaustion.

The airport is surrounded by building structures and roadways, leaving few options for an off-airport landing in the event of an emergency. The accident site was adjacent to the end of the runway therefore it is likely that at the time the flight instructor realized the emergency, there was insufficient distance remaining on the runway to land. The pilot chose to make a left turn to try and return to the runway, however during the turn, he failed to maintain airspeed and exceeded the airplane's critical angle of attack which resulted in an aerodynamic stall/spin at an altitude too low to recover.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power shortly after takeoff due to fuel exhaustion, and the exceedance of the airplane's critical angle of attack when the flight instructor made an abrupt turn back toward the runway, which resulted in an aerodynamic stall/spin at an altitude too low for recovery. Contributing to the accident was an inadequate preflight inspection.

Findings

Aircraft	Airspeed - Attain/maintain not possible
Personnel issues	Aircraft control - Instructor/check pilot
Aircraft	Angle of attack - Not attained/maintained
Aircraft	Fuel - Fluid level
Personnel issues	Preflight inspection - Instructor/check pilot

Factual Information

History of Flight

Initial climb	Fuel exhaustion (Defining event)
Initial climb	Abrupt maneuver
Initial climb	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On September 3, 2018, about 1710 Pacific daylight time, a Cessna 150L airplane, N10789, impacted terrain shortly after takeoff from Whiteman Airport (WHP), Los Angeles, California. The flight instructor was fatally injured, and the passenger was seriously injured. The airplane was substantially damaged. The airplane was registered to N10789 LLC and was being operated by Rotor F/X as a Title 14 *Code of Federal Regulations* Part 91 local discovery flight.

According to the Federal Aviation Administration (FAA) air traffic control recording, about 50 seconds after the airplane was cleared for takeoff on runway 12, the instructor stated, "Whiteman tower N10789 needs to turn back." The tower controller then cleared the airplane to land on runway 12; no further communications were received from the instructor.

Several witnesses saw the airplane after it departed WHP. One witness reported that the engine sounded abnormal, "like it was sputtering." Another witness reported seeing the airplane "at a very low altitude" and descending rapidly and the wings "dipping side to side." Subsequently, the airplane rolled left when the engine stopped and entered a spiraling turn. The airplane impacted the overhang of a building before it descended to the concrete coming to rest inverted. The witnesses went to the wreckage site and attempted to assist the occupants. One of the witnesses extinguished a small oil fire in the engine area and noted that no fuel was leaking from the airplane; another witness confirmed that there was no fuel leakage or smell of aviation fuel.

The passenger did not provide a statement as to the events leading up to the accident.

A GoPro camera which was mounted in the airplane provided an over-the-shoulder view of the airplane occupants and instrument panel; there was no audio. The engine rpm gauge was occasionally visible, depending on the occupants' positions. The video recording began while the flight instructor was taxiing the airplane. The airplane then stopped in the run-up area. Subsequently, the instructor began going through the checklist with the passenger, and the passenger grabbed the yoke and followed along with the instructor as he checked the flight controls. The instructor taxied the airplane onto the runway and, with his hands still on the yoke, the passenger advanced the throttle to start the takeoff roll. The airplane became airborne, and about 20 ft above ground level (agl), the instructor removed his hands from the yoke and gave a thumbs up. Two seconds later, the nose dropped. Immediately thereafter, the instructor put his right hand on the yoke and left hand on the throttle; the rpm gauge indicated between 2,200 and 2,300 rpm. The instructor appeared to verify that the throttle was at full power and that the mixture was full rich; the rpm gauge read about 2,300 rpm.

When the airplane was about 50 ft agl, the instructor quickly pulled back the throttle, and the rpm dropped to 1,300. He then increased the throttle to full power, and the rpm increased to 2,200 rpm. The instructor appeared to be looking outside the cockpit. The instructor then initiated a left bank, and the airplane subsequently pitched up and banked left about 15° to 20°. The airspeed began to slow, and the ball in the turn-and-slip indicator showed an almost full-right deflection. The instructor continued to pull the yoke aft as the airspeed continued to decrease throughout the turn. Subsequently, the airplane rapidly entered a left spin about 50 ft agl, turned about 270°, and then impacted the roof of a building and then terrain.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	August 27, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	September 30, 2016
Flight Time:	(Estimated) 1701 hours (Total, all aircraft)		

The owner of the airplane reported that the flight instructor had been flying the airplane for about 3 years. The pilots are not on the operator's payroll but paid directly through the students. The pilot regularly flew the accident airplane and conducted about six to eight discovery flights a week in addition to his regular training flights.

According to the owner, this was the flight instructor's second discovery flight of the day in the accident airplane; the first flight was about 30 minutes long. In addition, the flight instructor flew the accident airplane about 30 minutes the day before the accident and about 1.5 hours with a student 2 days before the accident.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N10789
Model/Series:	150L	**Aircraft Category:**	Airplane
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	15075041
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	July 12, 2018 100 hour	**Certified Max Gross Wt.:**	1601 lbs
Time Since Last Inspection:	36 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4123.3 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	O.200.A(48)
Registered Owner:		**Rated Power:**	100 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

According to the Cessna 150 Owner's Manual, each fuel tank holds 13 gallons of fuel. The unusable fuel in each tank is 1.75 gallons.

According to a refueling record, 15.70 gallons of fuel were added to the airplane 2 days before the accident. A student reported that he was present when the fuel was added; however, he was unsure how much was added or present in the fuel tanks. Immediately after refueling, the student flew with the instructor for about 1.5 hours practicing touch-and-go landings. The student further stated that he had recently asked the instructor what to do if the engine lost power during takeoff; the instructor responded that you would turn back to the runway.

No one reported the actions the flight instructor and passenger took before the accident flight to determine if a preflight inspection was accomplished. No flight records were maintained by the operator in order to determine the fuel quantity prior to the accident flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VNY,802 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	16:51 Local	**Direction from Accident Site:**	230°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / 16 knots	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.8 inches Hg	**Temperature/Dew Point:**	28°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Los Angeles, CA (WHP)	**Type of Flight Plan Filed:**	None
Destination:	Los Angeles, CA (WHP)	**Type of Clearance:**	None
Departure Time:	17:09 Local	**Type of Airspace:**	

Airport Information

Airport:	Whiteman Airport WHP	**Runway Surface Type:**	Asphalt
Airport Elevation:	1003 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	12	**IFR Approach:**	None
Runway Length/Width:	4120 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

Runway 12 is 4,120 ft long and 75 ft wide. Building structures and roadways surround the airport on all sides.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	34.257221,-118.408889(est)

The airplane impacted the overhang of a building located about 500 ft northeast of the departure end of runway 12. The wreckage was contained to a small area positioned inverted on the concrete below the overhang. An impact mark was observed on the pavement extending from the main wreckage. The impact mark exhibited chevron marks, which were consistent with damage to the leading edge of the left wing. The aft fuselage was completely separated aft of the cabin and came to rest upright. The empennage was mostly intact and exhibited some crushing damage. The right wing was still attached to

the airframe. The outboard leading edge was crushed aft beyond the wing spar. The cabin area remained intact; however, the instrument panel was crushed back into the cabin area. Flight control continuity was established throughout the airframe.

The spinner was crushed flat, and the propeller assembly and a small portion of the crankshaft were found fracture-separated from the engine. The engine was pushed upward, and the top of the engine was embedded in the firewall; the No. 4 cylinder was found fracture separated. Fragments of the engine and internal engine components were found on the ground underneath the engine.

The engine exhibited heavy impact damage and the crankshaft could not be rotated by hand. The engine cylinders were examined with a borescope, which revealed that they exhibited normal operating wear signatures. The No. 2 cylinder was removed, and oil was noted throughout the inside of the engine. The magnetos remained attached to the engine. The magnetos were removed and both drives turned freely when rotated by hand with impulse coupling engagement observed. Both magnetos produced spark. The spark plugs were removed and exhibited normal operating wear signatures. Postaccident examinations of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

The fuel tanks exhibited crushing damage; however, they were not breached. Less than 1 gallon of blue fuel was recovered from both fuel tanks. The color and smell were consistent with 100LL aviation fuel, and the fuel tested negative for water. The fuel selector was found in the "ON" position.

Medical and Pathological Information

The Department of Medical Examiner-Coroner, Los Angeles, California, conducted an autopsy on the flight instructor. The cause of death was determined to be "blunt trauma."

The FAA Forensic Sciences Laboratory performed forensic toxicology on specimens from the instructor with negative results for carbon monoxide, ethanol, and all tested-for drugs.

Administrative Information

Investigator In Charge (IIC):	Link, Samantha
Additional Participating Persons:	Frank Motter; Federal Aviation Administration; Van Nuys, CA Andrew Hall; Textron Aviation; Wichita, KS Chris Lang; Continental Motors; Mobile, AL
Original Publish Date:	May 19, 2020
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98214

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.

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