



National Transportation Safety Board Aviation Accident Final Report

Location:	La Verne, CA	Accident Number:	WPR16LA030
Date & Time:	11/19/2015, 1335 PST	Registration:	N91HC
Aircraft:	CESSNA T210N	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Serious
Flight Conducted Under:	Part 91: General Aviation - Aerial Observation		

Analysis

The commercial pilot was performing an aerial survey flight and departed with the fuel tanks filled to maximum capacity. After performing the survey, he began his return to the destination airport with about 40 minutes of fuel on board. While en route, he determined the fuel quantity was lower than he expected and opted to divert to a nearby airport. Before landing, the pilot switched the fuel selector to the fullest fuel tank (left side), which showed about 6-7 gallons; the right side showed about 4-5 gallons. While on final approach, the engine suddenly experienced a total loss of power, and the pilot was unable to restart it. With the propeller windmilling, the pilot aligned the airplane with the closest runway and configured the airplane for best glide. As the airplane neared the ground, the left wing collided with a sign and the airplane impacted the ground. The airplane erupted in flames and was partially consumed by fire.

The left wing was separated from the airframe and mostly consumed by fire. The right wing was partially burned and remained loosely attached to the airframe. Wreckage retrieval personnel recovered about 2 1/4 gallons of fuel from the right wing and stated that there was water in the sample; however, foam had been used to extinguish the fire, and the source of the water could not be determined. Due to the severe damage to the fuel system, continuity of the system could not be established. The examination revealed no evidence of mechanical malfunction or failures of the airframe or engine that would have prevented normal operation. Fuel consumption calculations revealed that, if the airplane departed on the flight with full fuel tanks, then there should have been about 21 gallons of fuel on board at the time of the accident. Due to the damage and postimpact fire, which precluded thorough examination of the fuel system and determination of the amount of fuel on board, the reason for the loss of engine power could not be determined.

Probable Cause and Findings

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

The total loss of engine power for reasons that could not be determined based on the available information.

Findings

Environmental issues	Sign/marker - Contributed to outcome
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

History of Flight

Approach	Loss of engine power (total) (Defining event)
Landing-landing roll	Off-field or emergency landing
Post-impact	Fire/smoke (post-impact)

On November 19, 2015, about 1335 Pacific standard time, a Cessna T210N Centurion, N91HC, experienced a loss of engine power and collided with a sign while the pilot was making an emergency approach to land at Brackett Field, La Verne, California. Aircraft Guaranty Corp was the registered owner and was operating the airplane under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91. The commercial pilot, the sole occupant, was seriously injured; the airplane sustained substantial damage. The aerial surveying personal flight originated from Camarillo Airport, Camarillo, California about 0910 and the pilot had intended to land back at that airport. Visual meteorological conditions prevailed and no flight plan was filed.

The pilot stated that he was an airplane mechanic for his profession, but had been down in southern California for the previous two days helping doing an aerial surveying job. Earlier in the morning he had the fuel tanks filled to maximum capacity and flew his intended route down in the San Diego area. As he began to return back to the destination airport, he recalled having 15 gallons of fuel on board, which the JP Instrument (JPI) gauge indicated equated to about 40 minutes of flight time. About 1325 he began to descend from his en route altitude of about 13,500-14,000 feet mean sea level (msl) and opted to land at Brackett due to the airplane's low fuel quantity.

Before landing, the pilot switched to the fullest tank (left side) which showed about 6-7 gallons and the right side had about 4-5 gallons. While on final approach, the engine suddenly lost power and despite his attempts, he was unable to successfully have it restart. With the propeller wind milling he aligned with the closest runway and configured the airplane for the best glide. The left wing suddenly impacted a sign that he did not previously observe and the airplane dove toward the ground. The pilot egressed through the windshield and shortly thereafter, the airplane erupted in flames. The airplane came to rest about 620 feet east of runway 26R.

The Federal Aviation Administration (FAA) provided the audio recording of the Brackett Air Traffic Control (ATC) communication with the pilot. The pilot made his initial radio call about 1330 stating that he was inbound to land and had the current ATIS (Automated Terminal Information System) information. The tower instructed him to enter the right base leg of the traffic pattern for runway 26L. After reading back the controller's instructions, the pilot stated that he was "quite low on fuel." The tower cleared the pilot to land on runway 26L at 1335 and he acknowledged. After about one minute and 15 seconds, the pilot transmitted that he was now requesting to land on runway 26R. About 5-10 seconds after the pilot made a radio call reading back his amended clearance, the airplane impacted the sign.

Pilot Information

Certificate:	Commercial	Age:	46, 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:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	07/03/2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	09/28/2015
Flight Time:	(Estimated) 1500 hours (Total, all aircraft), 85 hours (Total, this make and model), 1450 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 26 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N91HC
Model/Series:	T210N	Aircraft Category:	Airplane
Year of Manufacture:	1981	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	64441
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	05/29/2015, Annual	Certified Max Gross Wt.:	3800 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	10863 Hours as of last inspection	Engine Manufacturer:	Continental Motor
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	TSIO-520-RCM
Registered Owner:	Aircraft Guaranty Corp	Rated Power:	285 hp
Operator:	Aircraft Guaranty Corp	Operating Certificate(s) Held:	None

The airplane, a Cessna Aircraft T210N, serial number 64441, was equipped with a Continental Motors TSIO-520-R engine, serial number 512148. The operator provided excerpts from the engine logbooks that included the last maintenance performed. The records indicated that the

last annual inspection was recorded as being completed in May 2015 at a tachometer time of 6,788.6 hours and a total airframe time of 10,862.5 hours; the tachometer time at the time of the accident was 5,435 hours, or about 35 hours after the maintenance.

A fuel consumption calculation prepared by a Cessna Aircraft Company representative (contained in the public docket for this accident) showed that the airplane should have had about 21 gallons of fuel on board at the time of the accident, assuming that the airplane was filled to maximum capacity (89 gallons) prior to departure, as reported by the pilot. According to the pilot, the airplane climbed to about 14,000 ft msl and cruised at about 13,600 msl at an average speed of 165 kts. According to the Cessna Aircraft Pilot's Operating Handbook (POH) for the airplane, to maintain that airspeed, the engine would be operating at 2,400 rpm and 24 inches of manifold pressure. Based on this assumption, with the airplane configured at a gross weight of 3,7000 lbs, the fuel consumption to reach the cruising altitude would be about 44.5 lbs and the consumption during cruise flight would be about 81 lbs per hour. With the engine operating about 4 hours and 20 minutes, this would equate to a total fuel consumption of 68 gallons.

The pilot stated that he was averaging about 18 gallons per hour and should have had enough fuel to make it to the runway. He estimated that he was airborne for about 4 hours and 20 minutes and he recalled that in the past, the airplane could fly for 4.7 hours. He thought there might have been a fuel starvation event but didn't know what the reason would be.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KPOC, 1011 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	1335 PST	Direction from Accident Site:	352°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.96 inches Hg	Temperature/Dew Point:	27° C / -5° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CAMARILLO, CA (CMA)	Type of Flight Plan Filed:	None
Destination:	La Verne, CA (POC)	Type of Clearance:	VFR
Departure Time:	0910 PST	Type of Airspace:	

Airport Information

Airport:	BRACKETT FIELD (POC)	Runway Surface Type:	Asphalt
Airport Elevation:	1013 ft	Runway Surface Condition:	Dry
Runway Used:	26R	IFR Approach:	None
Runway Length/Width:	3661 ft / 75 ft	VFR Approach/Landing:	Forced Landing; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	34.091667, -117.781667 (est)

Tests And Research

A post accident examination was conducted by a Federal Aviation Administration (FAA) inspector and a mechanic. The airplane had been disassembled during the recovery process and the center fuselage section was consumed by fire. A complete examination report with accompanying photographs are in the public docket for this accident.

The left wing was separated from the airframe and only a small outboard section remained; the rest was consumed by fire. The right wing was partially burned and remained loosely attached to the airframe at the accident site; the Monarch-style fuel cap was secure. The wreckage retrieval personnel recovered 2 gallons and 1 quart of fuel from the right wing and stated that there was water in the sample. He noted that foam had been used to extinguish the fire and could not determine if the water was present because of the foam.

The fuel system had been severely compromised by the fire and investigators were unable to establish continuity from the wing through the fuselage to the engine-driven fuel pump. The fuel selector was found, and removed from the deformed cabin area; post crash fire precluded it from turning.

An external examination of the engine revealed that cylinder fins and outer cooling fins were crushed and bent on the left side of the engine. After the spark plugs had been removed the cylinder heads were bore-scoped with no internal cylinder anomalies identified during that

internal inspection. The exhaust system was observed to have sustained ductile bending and crushing aft of the turbo-charger. The turbo-charger exhibited no apparent damage and rotated freely by hand.

The ignition harnesses were attached from both magnetos to their respective spark plugs. The magnetos remained securely attached to their respective mounts. Investigators removed the right magneto and tested the internal continuity via hand rotation which produced spark. The top spark plugs were removed; no mechanical damage was noted and the electrodes and posts exhibited no abnormal or remarkable color markings. Continuity of the fuel system could not be established due to the post crash fire.

The Hartzell propeller blades were observed attached to their hub assemblies, which were attached to the propeller shaft flange. The propeller blades were torsionally twisted and exhibited an "S" bend.

There was no evidence of mechanical malfunction or failure with the airframe or engine.

Administrative Information

Investigator In Charge (IIC):	Zoe Keliher	Report Date:	03/19/2018
Additional Participating Persons:	Jeff Plants; Federal Aviation Administration; Los Angeles, CA		
Publish Date:	03/19/2018		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92345		

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](#).