



National Transportation Safety Board Aviation Accident Final Report

Location:	Tyler, MN	Accident Number:	CEN15LA382
Date & Time:	08/25/2015, 0847 CDT	Registration:	N2805Z
Aircraft:	PIPER PA 22-160	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 Serious, 1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The student pilot reported that the airplane was topped off with fuel before the flight and that he completed a functional check of the carburetor heat during his pretakeoff engine run-up. Shortly after liftoff, he observed a significant decrease in engine speed, and the airplane began to descend. He reduced the pitch to increase airspeed, but the airplane descended into a cornfield about 50 ft past the end of the runway.

Postaccident engine examination did not reveal any evidence of preimpact anomalies that would have precluded normal operation. Fuel samples from each wing tank, the fuel lines, the fuel strainer, and the carburetor bowl were consistent with 100 low-lead aviation fuel and did not contain any water or debris. The weather conditions were conducive to the formation of serious carburetor icing at all power settings. Additionally, the pilot reported that the grass runway was wet with dew, which likely increased the air humidity over the runway and the possibility of carburetor ice formation during taxi and takeoff. Although the pilot reported that he conducted a functional check of the carburetor heat before departure, it is likely he did not adequately ensure that the carburetor was clear of ice before beginning the takeoff. Based on the available information, the partial loss of engine power during takeoff was likely due to carburetor ice accumulation.

The pilot did not have a valid pilot certificate, and his most recent student certificate had been expired for 5.5 years. Additionally, federal regulations prohibit student pilots from acting as pilot-in-command of an aircraft carrying passengers.

Probable Cause and Findings

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

The student pilot's failure to adequately ensure the carburetor was clear of ice before takeoff, which resulted in a partial loss of engine power during takeoff due to carburetor icing.

Findings

Aircraft	Intake anti-ice, deice - Incorrect use/operation (Cause)
Personnel issues	Identification/recognition - Student pilot (Cause) Qualification/certification - Pilot
Environmental issues	Conducive to carburetor icing - Effect on equipment (Cause)

Factual Information

On August 25, 2015, about 0847 central daylight time, a Piper PA-22-160, N2805Z, collided with terrain during a forced landing shortly after takeoff from Tyler Municipal Airport (63Y), near Tyler, Minnesota. The student pilot sustained minor injuries and his two passengers sustained serious injuries. The airplane sustained substantial damage. The airplane was registered to the pilot and operated under the provisions of Title 14 *Code of Federal Regulations* Part 91 without a flight plan. Day meteorological conditions prevailed for the local flight that was originating at the time of the accident.

The pilot reported that the purpose of the flight was to take a couple family members on a pleasure flight. He stated that he completed a preflight inspection and topped-off the fuel tanks before the flight. He started the engine about 0837 and taxied to runway 32 (2,600 ft by 160 ft, grass). The pilot noted that the grass runway was wet with dew. The pilot reported that he completed a functional check of both magnetos and the carburetor heat during a pretakeoff engine runup. The pilot stated that he selected wing flaps to 20° (half-flaps) and that about 3/4 of the available runway length was used to achieve liftoff. The pilot reported that shortly after liftoff he observed the engine speed had decreased from takeoff power to 1,900 rpm and the airplane began to descend. He reduced airplane pitch to increase airspeed, but the airplane descended into a cornfield about 50 ft past the end of the runway.

The airplane and its engine were examined by a Federal Aviation Administration (FAA) airworthiness inspector and a representative from the engine manufacturer. Flight control cable continuity was established from the cockpit controls to each flight control surface. Fuel samples from each wing tank, fuel lines, fuel strainer, and the carburetor bowl were consistent with 100 low-lead aviation fuel and did not contain any water or debris. The carburetor air box was partially deformed by impact but otherwise appeared intact. The engine, a Lycoming O-320-B2A, serial number L-1872-39, remained attached to the airframe. The engine case remained intact with the accessory components still attached to their respective installation points. 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. Both magnetos remained attached to the engine case and provided spark on all posts while the crankshaft was rotated. The magneto timing was about 25° before top dead center. The spark plugs exhibited features consistent with normal engine operation. A borescope inspection of each cylinder did not reveal any anomalies with the cylinders, pistons, valves, or valve seats. The oil pickup screen was clear of debris. The disassembly of the carburetor revealed no water, corrosion, or debris in the bowl assembly. No anomalies were observed with the composite floats or the needle valve. A visual examination of the carburetor fuel inlet screen revealed no evidence of debris. The postaccident examination did not reveal any anomalies that would have precluded normal engine operation during the flight.

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 Southwest Minnesota Regional Airport (MML), Marshall, Minnesota, about 17 nautical miles northeast of the accident site. At 0855, about 8 minutes after the accident, the MML automated surface observing system reported: wind 320° at 8 knots, 10

miles surface visibility, clear sky, temperature 13°C, dew point 8°C, and an altimeter setting 30.21 inches of mercury.

According to a carburetor icing probability chart contained in FAA Special Airworthiness Information Bulletin CE-09-35, entitled "Carburetor Icing Prevention", the recorded temperature and dew point were in the range of susceptibility for the formation of serious carburetor icing at all engine power levels. Additionally, if ice forms in the carburetor of a fixed pitch propeller aircraft, the restriction to the induction airflow will reduce power and result in a drop of engine rpm.

According to FAA airman records, the pilot did not have a valid student certificate at the time of the accident. The pilot's most recent student certificate was issued on February 15, 2005, and subsequently expired on February 28, 2010. Additionally, according to Title 14 *CFR* Part 61.89(a), a student pilot is prohibited from acting as pilot-in-command of an aircraft carrying passengers.

History of Flight

Taxi-to runway	Other weather encounter
Takeoff	Loss of engine power (partial) Attempted remediation/recovery
Landing	Off-field or emergency landing Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Student	Age:	39, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Lap Only
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 None	Last FAA Medical Exam:	02/15/2005
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 81.7 hours (Total, all aircraft), 81.7 hours (Total, this make and model), 58.7 hours (Pilot In Command, all aircraft), 0 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	PIPER	Registration:	N2805Z
Model/Series:	PA 22-160	Aircraft Category:	Airplane
Year of Manufacture:	1959	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	22-6798
Landing Gear Type:	Tailwheel	Seats:	4
Date/Type of Last Inspection:	04/21/2015, Annual	Certified Max Gross Wt.:	2000 lbs
Time Since Last Inspection:	7 Hours	Engines:	1 Reciprocating
Airframe Total Time:	2433.81 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-320-B2A
Registered Owner:	On file	Rated Power:	160 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MML, 1183 ft msl	Distance from Accident Site:	17 Nautical Miles
Observation Time:	0855 CDT	Direction from Accident Site:	55°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	320°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.21 inches Hg	Temperature/Dew Point:	13° C / 8° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tyler, MN (63Y)	Type of Flight Plan Filed:	None
Destination:	Tyler, MN (63Y)	Type of Clearance:	None
Departure Time:	0847 CDT	Type of Airspace:	Class G

Airport Information

Airport:	Tyler Municipal Airport (63Y)	Runway Surface Type:	Grass/turf
Airport Elevation:	1742 ft	Runway Surface Condition:	Wet
Runway Used:	32	IFR Approach:	None
Runway Length/Width:	2600 ft / 160 ft	VFR Approach/Landing:	Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	2 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious, 1 Minor	Latitude, Longitude:	44.291667, -96.150278 (est)

Administrative Information

Investigator In Charge (IIC):	Andrew T Fox	Report Date:	03/18/2019
Additional Participating Persons:	Allan Thilmany; Federal Aviation Administration, Minneapolis FSDO; Minneapolis, MN David R Nelson; Federal Aviation Administration, Minneapolis FSDO; Minneapolis, MN Troy Helgeson; Lycoming Engines; Williamsport, PA		
Publish Date:	03/18/2019		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=91862		

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