Aviation Investigation Final Report

Location:	Scott City, Kansas	**Accident Number:**	CEN23LA264
Date & Time:	June 24, 2023, 11:30 Local	**Registration:**	N9721Q
Aircraft:	Beech B19	**Aircraft Damage:**	Substantial
Defining Event:	Fuel starvation	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot stated that after he started the engine, he let it idle about 600 rpm for a "few minutes," and began to taxi to the runway for departure. He waited for another airplane to perform a back-taxi and depart, then he back-taxied and completed an engine run-up before realizing he left something behind. He then taxied back to the fixed base operator (FBO), collected his items, and again taxied to the runway for departure. He did not complete another engine run-up before takeoff.

During the takeoff roll, he noticed the engine rpm increased and did not note any anomalies. During the initial climb, the engine rpm maintained about 2,200 rpm with full throttle set. He stated that he was able to climb about 500 ft above ground level (agl) and attempted a return to the airport. He said that when he was abeam the runway, he thought he was "losing altitude and power," and made a shallow left turn towards the runway. Unable to maintain altitude during the turn, the pilot landed on a dirt road. During touchdown, the airplane bounced, exited the roadway, impacted a ditch, and slid into a cornfield, which resulted in substantial damage to the fuselage.

During a postaccident examination, no preimpact mechanical malfunctions or failures were discovered that would have precluded normal operation.

When the temperature and dewpoint at the time of the accident were plotted on a carburetor icing probability chart, it was revealed that the airplane was operating in an environment conducive for serious carburetor icing at a glide power setting. The pilot stated that he checked the carburetor heat before departure. After the carburetor heat check, it is likely that ice began to form in the carburetor's venturi during the extended ground operation before departure, which, in turn, limited the engine rpm at 2,200.

Probable Cause and Findings

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

A partial loss of engine power as a result of carburetor icing that formed while the engine was operating at a low power setting for an extended period before departure.

Findings

Environmental issues	Conducive to carburetor icing - Effect on equipment
Aircraft	Intake anti-ice, deice - Not used/operated

Factual Information

History of Flight

Initial climb	Fuel starvation (Defining event)
Initial climb	Loss of engine power (partial)

On June 24, 2023, about 1130 central daylight time, a Beech B19, N9721Q, sustained substantial damage when it was involved in an accident near Scott City, Kansas. The pilot was uninjured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, he added 17.16 gallons of fuel which brought the total quantity to about 30 gallons. He then started the engine, let it idle about 600 rpm for a "few minutes," and began to taxi to runway 35 at Scott City Municipal Airport (TQK). He waited for another airplane to perform a back-taxi and depart, then he back-taxied and completed an engine run-up before realizing he left something behind. He then taxied back to the FBO, collected his items, and taxied back to the runway for departure.

The pilot stated that during the takeoff roll, he noticed that the engine rpm increased and did not note any anomalies. During the initial climb, he saw the engine RPM maintained about 2,200 rpm with full throttle. He stated that he was able to climb to about 500 ft agl and attempted a return to the airport. He said that when he was abeam the runway, he thought he was "losing altitude and power," and made a shallow left turn towards the runway. Unable to maintain altitude during the turn, the pilot attempted a landing on a dirt road. During touchdown, the airplane bounced, exited the roadway, impacted a ditch, and slid into a cornfield, which resulted in substantial damage to the fuselage.

A pilot witness reported seeing the accident airplane depart and noted that it did not appear to be climbing well when it started a turn to the northeast. He estimated the airplane was about 50 to 100 ft agl, when he lost sight of it while he was taxing. After he turned his airplane around, he saw the accident airplane again when it was southwest of the runway. He stated that it appeared to be less than 100 ft agl and about 30° nose down at the time of impact.

During a postaccident examination, continuity was established from the engine controls in the cockpit to their respective engine attach points. No preimpact mechanical malfunctions or anomalies were found that would have precluded normal operation.

The reported weather conditions about 15 minutes before the accident included a temperature of 82°F and dewpoint of 59°F. When plotted on a carburetor icing probability chart, the airplane was operating in an environment conducive for serious carburetor icing at a glide power setting. (See Figure 1)

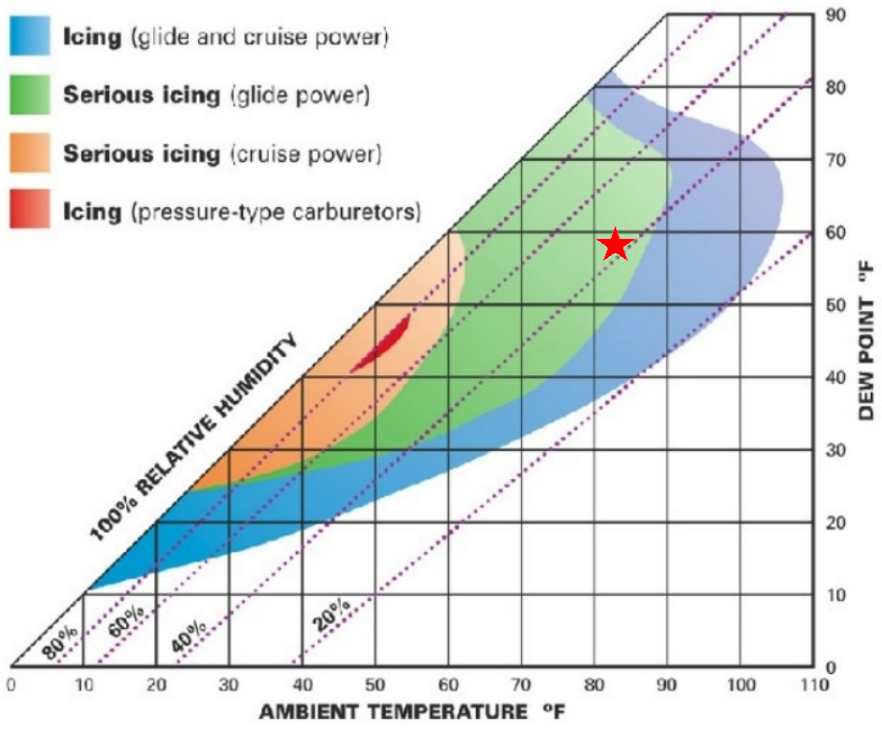

Figure 1: Carburetor Icing Probability Chart. Reference: Special Airworthiness Information Bulletin CE-09-35

Pilot Information

Certificate:	Private	**Age:**	50
Airplane Rating(s):	Single-engine land	**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:**	
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	January 25, 2023
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 5, 2018
Flight Time:	134 hours (Total, all aircraft), 84 hours (Total, this make and model), 116 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:	Beech	**Registration:**	N9721Q
Model/Series:	B19	**Aircraft Category:**	Airplane
Year of Manufacture:	1970	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	MB-493
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 10, 2023 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3482 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, activated	**Engine Model/Series:**	O-320-E2C
Registered Owner:	On file	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KTQK,2963 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	11:15 Local	**Direction from Accident Site:**	176°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	28°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	SCOTT CITY, KS (KTQK)	**Type of Flight Plan Filed:**	None
Destination:	CLAY CENTER, KS (KCYW)	**Type of Clearance:**	None
Departure Time:	09:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	SCOTT CITY MUNI TQK	**Runway Surface Type:**	
Airport Elevation:	2968 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	38.484405,-100.88589(est)

Preventing Similar Accidents

Preventing Carburetor Icing (SA-029)

The Problem

According to NTSB aircraft accident data, from 2000 to 2011, carburetor icing was a cause or factor in about 250 accidents. On average, carburetor icing causes or contributes to two fatal accidents per year. Accident evidence shows that some pilots do not recognize weather conditions favorable to carburetor icing and inaccurately believe that carburetor icing is only a cold- or wet-weather problem. Pilots may also have not used the carburetor heat according to the aircraft's approved procedures to prevent carburetor ice formation. In addition, some pilots may not recognize and promptly act upon the signs of carburetor icing.

What can you do?

- Check the temperature and dew point for your flight to determine whether the conditions are favorable for carburetor icing. Remember, serious carburetor icing can occur in ambient temperatures as high as 90° F or in relative humidity conditions as low as 35 percent at glide power.
- Refer to your approved aircraft flight manual or operating handbook to ensure that you are using carburetor heat according to the approved procedures and properly perform the following actions:
    - Check the functionality of the carburetor heat before your flight.
    - Use carburetor heat to prevent the formation of carburetor ice when operating in conditions and at power settings in which carburetor icing is probable. Remember, ground idling or taxiing time can allow carburetor ice to accumulate before takeoff.
    - Immediately apply carburetor heat at the first sign of carburetor icing, which typically includes a drop in rpm or manifold pressure (depending upon how your airplane is equipped). Engine roughness may follow.
- Consider installing a carburetor temperature gauge, if available.
- Remember that aircraft engines that run on automotive gas may be more susceptible to carburetor icing than engines that run on Avgas.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-029.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	David Gobble; FAA
Original Publish Date:	October 5, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192456