Aviation Investigation Final Report

Location:	Wichita Falls, Texas	**Accident Number:**	DFW08FA228
Date & Time:	September 14, 2008, 09:07 Local	**Registration:**	N571JH
Aircraft:	American Champion (ACAC) 7GCBC	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot took off on a flight and intended to remain in the traffic pattern. Winds were from 010 degrees at 16 knots gusting to 20 knots. A carburetor icing chart showed the potential for "moderate icing at cruise power or serious icing at descent power." Through a GPS and engine monitoring system, the accident flight was able to be partially reconstructed. Upon takeoff the airplane turned left and entered the downwind leg. As the airplane was rolling out on the downwind, a throttle reduction was recorded. The airplane continued on the south-southwest on the downwind leg for at least 14 seconds. As the airplane approached the base turn, the first recorded attempt to actuate the throttle is recorded as an increase in manifold pressure and spike in fuel flow. Manifold pressure fluctuates as the airplane make the base turn to final. Approximately 3/4 through the base turn, the airplane rolled out and flew a straight approach to the open field. Several witnesses observed the airplane approaching the open field without engine power. After "barely clearing" a transmission wire, the airplane was observed to quickly roll right and impact the ground "nose first." These statements are consistent with the airplane entering a stall/spin. An examination of the airframe and engine revealed no anomalies which would have precluded production of the engine power or the safe operation of the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain safe flying airspeed resulting in an inadvertent stall during the forced landing. Contributing to the accident was the loss of engine power due to carburetor icing.

Findings

Aircraft	Airspeed - Not attained/maintained
Environmental issues	Conducive to carburetor icing - Effect on equipment
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Approach-VFR pattern downwind	Fuel related
Approach-VFR pattern downwind	Loss of engine power (total) (Defining event)
Emergency descent	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On September 14, 2008, at 0907 central daylight time, a single-engine American Champion 7GCBC, N571JH, was substantially damaged upon impact with terrain near Kickapoo Municipal Airport (CWC), Wichita Falls, Texas. The private pilot, sole occupant of the airplane, was fatally injured. The airplane was owned and operated by the pilot. No flight plan was filed and visual meteorological conditions prevailed for the Title 14 Code of Federal Regulations Part 91 personal flight. According to the pilot's wife, the pilot had planned to remain in the traffic pattern at CWC.

Several witnesses saw the airplane or heard the engine. One witness heard the engine surge loudly and witnessed the airplane "struggling to find lift." Another person heard the engine "popping," go silent, and then start producing a "popping" noise again. Several of the witnesses observed the airplane's base to final leg and reported that they heard no engine noise. Witnesses also reporting seeing the propeller horizontal and then spinning as if the engine restart was attempted. Furthermore, witnesses stated that as the airplane approached the open field near the church, the airplane barely cleared a transmission line before quickly rolling right and impacting the ground "nose first."

PERSONNEL INFORMATION

The pilot, age 56, held a private pilot certificate with a single-engine land rating. A valid third class medical certificate was issued on May 7, 2008. A review of the pilot's logbook revealed that the pilot had logged over 314 hours total time. Thirteen hours were logged in the 7GCBC model, with 4.4 of those hours in the accident airplane. On May 19, 2008, the pilot completed a flight review in his Cessna 172G. Additionally, a tail wheel endorsement was signed on July 18, 2008, with training occurring in an American Champion 7BCM. A spin entry, spins, and spin recovery procedures endorsement was signed on August 2, 2008, with training occurring in an American Champion 8KCAB.

According to the pilot's wife, the pilot was very cautious and did not normally fly if winds were

greater than 15 knots, especially if there were strong cross-winds.

AIRCRAFT INFORMATION

The single-engine, high wing, fixed-gear, fabric covered airplane, serial number 1412-2006 was manufactured in 2006. It was powered by a 160-horsepower Lycoming O-320-B2B engine driving a metal, two-bladed, Sensenich 74DM6S8-1-56 fixed pitch propeller. Review of the maintenance logbook showed an annual inspection was completed August 14, 2008, at an airframe total time of 16.5 hours.

METEOROLOGICAL INFORMATION

At 0905, an automated weather reporting station at CWC, located approximately 0.5 nautical miles north of the accident site, reported winds from 010 degrees at 16 knots gusting to 20 knots, visibility 10 miles, skies clear, temperature 70 degrees Fahrenheit, dew point 57 degrees Fahrenheit, and a barometric pressure of 30.04 inches of Mercury.

Use of a carburetor icing chart provided by the Federal Aviation Administration (FAA) showed the airplane was operating in an area of "moderate icing at cruise power or serious icing at descent power" at the time of the accident.

WRECKAGE AND IMPACT INFORMATION

The airplane's wreckage was located in a flat, open field approximately 0.5 nautical miles south of CWC's runway 35 approach end. Several obstructions were present near the accident scene: a church was located approximately 50 yards to the north, a highway ran north-south about 130 yards to the east and a transmission line ran east to west about 40 yards to the south of the accident site.

Impact signatures were consistent with the airplane being inverted in a nose low attitude. The airplane was generally aligned, although inverted, along a 052 magnetic heading. All components of the airplane were accounted for at the accident scene. The right wing sustained a larger amount of crushing damage than the left wing. The right wing struts remained attached to both the wing and the fuselage. The right main landing gear was bent forward and remained partially attached to the fuselage. Both the right flap and right ailerons were crushed. Damage to the right flap precluded an accurate reading of the flap position at impact. The left wing's leading edge sustained impact damage and the wing struts remained attached to both the wing and the fuselage. The left flap appeared to be in the down position. The top of the rudder was crushed inward. The engine remained attached to the airframe . Both propeller blades displayed rotational scoring and blade polishing.

Flight control continuity was established from the control stick to the aileron and elevator surfaces. Rudder continuity was established from the rudder surface to the rudder pedals. Although both tanks were breached, more than seven gallons of fuel were recovered from both

fuel tanks. The fuel tested negative for water intrusion using a water detection paste. Valve continuity and thumb compression was confirmed to all cylinders through rotation of the crankshaft propeller flange. Fuel was found in the carburetor bowl chamber which tested negative for water intrusion using a water detection paste. Upon rotation, both magnetos produced spark at the terminals.

The airplane's pitot heat, landing light, navigation light, avionics, master, left ignition and right ignition switches were found in the off position. The strobe light switch was found in the on position. None of the first responders recalled turning the switches off. A review of the 7GCBC's POH's checklist for FORCED LANDING (Complete Power Failure) includes step 8: "All Electrical Switches - OFF."

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was perform on the pilot on September 15, 2008, by Tarrant Country Medical Examiner, Fort Worth, Texas, as authorized by the Wichita County Medical Examiner, Wichita Falls, Texas. The autopsy ruled the cause of death as "massive blunt force trauma of head, chest, and extremities."

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated no tested levels of carbon monoxide, cyanide, ethanol, or drugs were present in the specimens.

TEST AND RESEARCH

A follow-up examination of the engine and fuel system was conducted on the accident airplane. All fuel lines were found to be unobstructed. The fuel screen was found to be clear of debris. The JPI engine data management (EDM) fuel flow monitor was found to rotate freely. The fuel shut-off valve was impact damaged and, upon disassembly, was found in the "on" position. No anomalies with the fuel system were found which would have precluded the normal flow of fuel. Both magnetos were examined and produced spark at each terminal. Crushing damage to the engine's air box precluded an accurate assessment of the heat gate position prior to impact.

ADDITIONAL INFORMATION

GLOBAL POSITIONING SYSTEM (GPS) DATA

The airplane was operating with a Garmin GPSmap 496. The GPS was recovered and sent to the National Transportsation Safety Board (NTSB) laboratory was analysis. Multiple tracks were recovered from the GPS unit, and the accident flight was determined to be "Track 22." The track depicted the airplane as it taxied to the runway, delayed for about 5 minutes in the run-up area, and performed a takeoff. After takeoff, the airplane turned left to enter the downwind leg. As the airplane traveled south-southwest on downwind, the airplane past

abeam the runway threshold approximately 3/4 miles wide heading 190 degrees true and continued 1/2 mile before turning base. After about 3/4 through the turn, the airplane straightened out and began a flight path towards the open field. Below is an excerpt of the last few GPS data points displaying time, altitude, ground speed, and true heading.

9:06:03	1259 ft	50 mph	22° true
9:06:06	1248 ft	46 mph	30° true
9:06:11	1204 ft	44 mph	28° true
9:06:20	1139 ft	38 mph	23° true
9:06:27	1082 ft	44 mph	72° true
9:06:34	1018 ft	10 mph	259° true
9:06:52	1000 ft	0.5 mph	205° true
9:07:21	996 ft		

Of note, the 7GCBC's Pilot's Operating Handbook (POH) lists 60 to 65 mph as the airspeed to maintain following a total loss of engine power and 47 mph as the flaps down stall speed.

J.P. INSTRUMENTS (JPI) DATA

A JPI EDM 930 was recovered and sent to JPI for data extraction. The EDM data began capturing data for the accident flight beginning at 08:59:48 with the last capture at 09:16:30. Below is an excerpt of the last few data points displaying time, oil temperature (degrees Fahrenheit), fuel flow (gallons per hour), revolutions per minute, and manifold pressure.

TIME	FF	RPM	MAP
09:15:18	11.0	2448	24.1
09:15:24	11.0	2501	24.0
09:15:30	9.3	1587	19.3
09:15:36	0.0	1053	13.2
09:15:42	0.2	884	13.0
09:15:48	0.0	751	13.8
09:15:54	0.2	529	20.3
09:16:00	0.3	615	18.5
09:16:06	0.0	644	17.7
09:16:12	0.0	489	20.7
09:16:18	0.0	347	24.3
09:16:24	0.0	309	28.8
09:16:30	0.0	301	28.9

COMPARISON BETWEEN GPS AND JPI EDM 930 DATA

Comparing the engine parameters data to the GPS plots, it was estimated that the EDM 930's clock was 10 minutes and 36 seconds late. Using the "synchronized" timeline, the first fuel flow reduction occurs near 09:04:54 when the airplane is rolling out of the downwind leg. At

this time, the airplane is roughly 1,776 feet mean sea level (msl) and traveling at 134 mph. The next point of interest occurs at the synchronized time of 09:05:18 when the manifold pressure ncreases to 20.3 inches of Mercury with a 0.2 gallons per hour spike in fuel flow. At this time, the airplane is approaching the base turn at an altitude of 1,756' msl and traveling 99 mph. Over the last 30 seconds of recorded EDM data the fuel flow remains zero, with decaying rpm, and fluctuating manifold pressure. The EDM 930 stopped recording data near the GPS's 09:05:55 data point, which coincided with the airplane's termination of the final turn and the straight-in leg towards the accident site.

Pilot Information

Certificate:	Private	**Age:**	56,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	May 1, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 19, 2008
Flight Time:	314 hours (Total, all aircraft), 13 hours (Total, this make and model), 14 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	American Champion (ACAC)	**Registration:**	N571JH
Model/Series:	7GCBC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	1412-2006
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	August 14, 2008 Annual	**Certified Max Gross Wt.:**	1650 lbs
Time Since Last Inspection:	6.3 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	22.8 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-B2B
Registered Owner:	On file	**Rated Power:**	160 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:	CWC,1003 ft msl	**Distance from Accident Site:**	
Observation Time:	09:05 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	16 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	21°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WICHITA FALLS, TX (CWC)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	09:04 Local	**Type of Airspace:**	

Airport Information

Airport:	KICKAPOO DOWNTOWN AIRPARK CWC	**Runway Surface Type:**	Concrete
Airport Elevation:	1003 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	35	**IFR Approach:**	None
Runway Length/Width:	4450 ft / 75 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.859565,-98.489349(est)

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Charles W Dawson; FAA FSDO; Fort Worth, TX John Butler; Lycoming Engines; Arlington, TX
Original Publish Date:	May 12, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68926