Aviation Investigation Final Report

Location:	Kingsland, Texas	**Accident Number:**	CEN12FA616
Date & Time:	September 8, 2012, 18:40 Local	**Registration:**	N70108
Aircraft:	Piper J3C-65	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Witnesses indicated that the airplane was climbing slowly in a nose-up attitude during the initial climb. They noted a slow forward speed and that the engine did not sound like it was operating at full power. The airplane had climbed to an altitude of about 125 feet above ground level and then suddenly rolled to the left and descended in a nearly vertical attitude and impacted terrain on the left side of the runway. The airplane was equipped with a 4-point shoulder harness installation; however, the pilot was using only a lap belt restraint system. Records showed that the airplane had been flown only once in the past year and that the required annual inspection was overdue.

A postaccident examination of the engine showed that corrosion and oil glazing were present and the intake valve on the No. 1 cylinder was stuck in the open position. Based on the available evidence, it is likely that the No. 1 cylinder intake valve was stuck open and resulted in a partial loss of engine power.

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 adequate airspeed following a partial loss of engine power resulting from an engine intake valve that became stuck open. Contributing to the accident was the pilot's decision to operate the airplane when a required maintenance inspection was overdue. Contributing to the severity of the pilot's injuries was his decision to operate the airplane without using the installed shoulder harness restraints.

Findings

Aircraft	(general) - Damaged/degraded
Personnel issues	Decision making/judgment - Pilot
Aircraft	(general) - Not used/operated
Personnel issues	Decision making/judgment - Pilot
Aircraft	Scheduled maint checks - Not inspected

Factual Information

History of Flight

Initial climb	Loss of engine power (partial)
Initial climb	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On September 8, 2012, about 1843 central daylight time, a Piper Aircraft Inc., J3C-65 airplane, N70108, was substantially damaged when it impacted terrain during initial climb at Shirley Williams Airport (44TE), Kingsland, Texas. The pilot sustained fatal injuries. The airplane was registered to and operated by the pilot, under the provisions of 14 Code of Federal Regulations Part 91, as a personal flight. Day visual meteorological conditions prevailed and no flight plan was filed. At the time of the accident the local flight was originating from 44TE.

The solo pilot was seated in the rear seat and began a takeoff from the far south end of runway 34. After liftoff about mid-field, several witnesses described the airplane as climbing slowly in a nose-up attitude with a slow forward speed. Several witnesses said the engine was operating, but did not sound like it was operating at full power. The airplane had climbed to an altitude of about 125 feet above ground level (agl) and then suddenly rolled to the left and descended in a nearly vertical attitude impacting terrain on the left side of the runway.

Pilot Information

Certificate:	Private	**Age:**	53
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
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:**	February 11, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 11, 2011
Flight Time:	(Estimated) 254 hours (Total, all aircraft), 126 hours (Total, this make and model), 11 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft)		

The pilot, age 53, held a Federal Aviation Administration (FAA) private pilot certificate with ratings in airplane single engine land and in airplane single engine sea. He did not hold an instrument rating.

The pilot also held an FAA third-class medical certificate, issued on February 11, 2011, with a restriction "must wear corrective lenses."

Based on a review of the pilot's personal logbook, estimates from family members and friends, and FAA medical certification records; the pilot's flight experience in all aircraft was estimated as a total of about 254 hours with the last entry made in the pilot logbook on July 22, 2012. About 160 of those hours were in tail-wheel airplanes, which included a total of about 126 hours in the accident airplane. The pilot's logbook showed his most recently logged flight time in the accident airplane was on December 26, 2011. Records show the pilot completed the requirements for a flight review on August 11, 2011.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N70108
Model/Series:	J3C-65	**Aircraft Category:**	Airplane
Year of Manufacture:	1946	**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	17082
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	November 11, 2010 Annual	**Certified Max Gross Wt.:**	1100 lbs
Time Since Last Inspection:	16 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2334 Hrs as of last inspection	**Engine Manufacturer:**	CONTINENTAL
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	C-85-12F
Registered Owner:	On file	**Rated Power:**	85 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The model J3C-65 airplane, serial number 17082, was manufactured by Piper Airplane Corporation in 1946, and had been registered to the owner since 2007. It was a 2-place, high wing, fabric covered, metal tube and wood airplane with conventional (tail-wheel) landing gear. It was not equipped with flaps.

The airplane was equipped with a Continental model C-85-12F carbureted reciprocating engine, serial number 24867-6-12, which drove a modified McCauley model 1B90 CM 7142 fixed-pitch metal alloy propeller.

A review of aircraft maintenance records revealed that the most recent annual inspection was completed on November 18, 2010, at an aircraft total time of 2,334 hours, an engine total time of 3,280 hours, and an engine time since overhaul of 1,263 hours. The tachometer reading in the cockpit showed a total of 24.6 hours had been recorded since the annual inspection. The most recent record of fabric recovering was on January 19, 1987, at an aircraft total time of 1,342 hours.

The airplane had been modified in 1967 with a "Reed Conversion" under STC SA811SW and Item 625 on the FAA Type Certificate Data Sheet. The conversion removed 40.5 inches from the inboard end of each wing, decreased the allowable gross weight of the aircraft from 1,220 pounds to 1,100 pounds, and restricted the allowable center of gravity (CG) from plus10.9 inches to plus 19.4 inches. The conversion

also modified the location of the strut attach points in the wing and modified the aileron control and balance cables.

Placards in the cockpit read:

"THIS AIRCRAFT HAS BEEN HIGHLY MODIFIED FOR COMPETITIVE AEROBATICS – EXERCISE EXTREME CAUTION WHEN DOING STALL MANEUVER".

"THIS IS A REED MODIFIED CLIPPED-WING AIRCRAFT"

"SOLO FLYING IN REAR SEAT ONLY"

The airplane did not have a wing tank but rather had only the original fuselage mounted 12 gallon fuel tank.

The cockpit was equipped with front and rear tandem pilot seats, and the pilot in either seat had access to all flight controls, engine controls, and wheel brakes.

The front seat was fitted with a 2-point restraint system which had a two strap lap belt. The rear seat had a 4-point restraint system with a similar lap belt system and a two strap shoulder harness system which fastened to the buckle at the center of the lap belt. The rear seat shoulder harness installation could be quickly removed from its attach point on the airframe at the top rear of the cabin, and could thus be converted to either a 2-point or 4-point restraint system. A postaccident examination showed that the removable shoulder harness system was stowed in a seat-back pocket on the back of the rear seat and was not connected to its attach point.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KDZB,1093 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	18:35 Local	**Direction from Accident Site:**	155°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	28°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Kingsland, TX (44TE)	**Type of Flight Plan Filed:**	None
Destination:	Kingsland, TX (44TE)	**Type of Clearance:**	None
Departure Time:	18:40 Local	**Type of Airspace:**	

The closest official weather reporting station was at Horseshoe Bay Resort Airport (KDZB), Horseshoe Bay, Texas, located 10 miles southeast from the accident location. At 1835, the

automated weather observation station at KDBZ reported wind from 010 degrees at 5 knots, visibility 10 miles, clear of clouds, temperature 28 degrees Celsius (C), dew point temperature 4 degrees C, and an altimeter setting of 30.03 inches of Mercury.

Airport Information

Airport:	Shirley Williams Airport 44TE	**Runway Surface Type:**	Grass/turf
Airport Elevation:	880 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	34	**IFR Approach:**	None
Runway Length/Width:	2600 ft / 100 ft	**VFR Approach/Landing:**	None

The Airport/ Facility Directory, Southwest U. S., indicated that runway 16/34 at the 44TE airport was 2,600 feet long and 100 feet wide. The runway surface was composed of turf. The elevation was estimated as 880 feet msl.

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:**	30.68361,-98.419441(est)

The impact location was on the left edge of runway 34 about 2,300 feet north from the take-off position at 44TE, and about 300 feet south of the north end of the runway. The airplane came to rest in a nose down attitude of about 45 degrees and the fuselage was laterally oriented about 60 degrees to the right of the runway centerline. A crater corresponding to the impact was found under the airplane. There was evidence of a fuel spill at the scene; however there was no postimpact fire.

Examination of the wreckage noted that there was significantly more damage to the right wing leading edge with impact compression damage along about two thirds of the outboard span. The angle of the impact crushing damage was consistent with an impact in a right wing low, nose low attitude of about 70 to 80 degrees nose down. The inboard root end of the right wing displayed impact damage consistent in size to the engine. The top of the engine also showed blue paint transfer on the cylinder baffling which corresponded to the damage noted to the inboard right wing.

Both wings were secure to the fuselage and both lift struts. Both struts were secure at both ends and the fork bolts were of the heavy type.

The rear seat remained attached, the seat belts remained attached, and rear cockpit area maintained its structural volume.

Control continuity was verified to the aileron and both the control and balance cables were continuous to the control stick and the right aileron attach point. The postaccident examination of the airframe revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

After documentation at the scene, the wreckage was moved from the runway and the engine was further examined. The engine exhibited impact damage. The propeller hub remained attached to the propeller flange which had significant damage from the impact sequence and was impinged against the crankcase. The propeller exhibited signs of rotation during impact and both of the propeller blades displayed chordwise scratches. The propeller flange was partially separated from the engine crankshaft and the fracture surface appeared to be smeared and deformed in overload.

All of the ignition leads were examined and several showed impact damage. The spark plugs were removed and examined and all showed normal wear patterns according to the Champion Aviation Service Manual AV6-R.

To facilitate rotation of the crankshaft the propeller flange was removed from the remainder of the crankshaft. The crankshaft was then rotated using a pipe wrench. No binding or grinding was noted during the examination and rotation of the crankshaft and engine drive train continuity was confirmed throughout. Both magnetos were observed to produce spark during the rotation.

As the crankshaft was rotated by hand thumb compression was established on the number 2, 3, and 4 cylinders, but not on the number 1 cylinder where the intake valve was observed stuck in the open position. The number 1 cylinder intake valve was freed and the valve did not stick during subsequent manual operation.

The number 1 cylinder was then removed and examination revealed oil glazing and corrosion inside the base of the cylinder barrel. The intake rocker arm and the intake valve were removed and examination found corrosion at the top of the intake valve stem. The examination did not reveal whether the valve had become stuck before or during the accident.

All of the other cylinders and valves were examined using a borescope and no preaccident defects were noted.

The exhaust and engine intake systems were examined. The oil sump sustained impact damage, remained attached to the engine, and contained an unmeasured amount of oil. No evidence of lubrication distress was observed. The impact damaged carburetor and fuel system were examined and no residual fuel was present. The carburetor fuel screen was examined and no defects or debris was observed.

Medical and Pathological Information

An autopsy was performed on the pilot by the Travis County Office of the Medical Examiner; Austin, Texas.

Forensic toxicology was performed on specimens from the pilot by the FAA, Aeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report was negative for ethanol and was negative for drugs.

Additional Information

According to FAA Advisory Circular AC No: 61-67C; Subject: Stall and Spin Awareness Training: Chapter 1: "If recovery from a stall is not made properly, a secondary stall or a spin may result. A secondary stall is caused by attempting to hasten the completion of a stall recovery before the aircraft has regained sufficient flying speed.

14 Code of Federal Regulations 91.107 (a) (3) requires that each person must occupy an approved seat with a safety belt and, if installed, a shoulder harness.

Administrative Information

Investigator In Charge (IIC):	Latson, Thomas
Additional Participating Persons:	Victor H Lopez; FAA San Antonio FSDO; San Antonio, TX Michael C McClure; Piper Aircraft Inc; Vero Beach, FL Kurt Gibson; Continental Motors, Inc.; Mobile, AL
Original Publish Date:	October 6, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=84972