Aviation Investigation Final Report

Location:	Deer Park, Washington	**Accident Number:**	WPR16FA001
Date & Time:	October 2, 2015, 11:12 Local	**Registration:**	N69BD
Aircraft:	Johnson Coot	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot departed in the experimental amateur-built airplane for the local flight during daytime visual meteorological conditions. A pilot reported that he had spoken to the accident pilot before the accident and that he had told him that he had been having problems priming the carburetor because the accident airplane's fuel tanks were below the engine. The accident pilot further told him that he had installed an electric boost pump to prime the carburetor and hoped that the engine-driven fuel pump would maintain engine operation. The accident pilot added that, during engine ground runs with the electric boost pump on, the engine was running too "rich" and "rough" and that he planned to turn the electric boost pump off to see if it would work. The pilot assumed that the accident pilot intended to do this on the ground, but it was unclear.

One witness, who was a rated pilot, reported that, after takeoff and while the airplane was upwind, he heard the engine "sputtering." The airplane then turned left and remained within the airport traffic pattern. Another witness, who was in an airplane in the airport traffic pattern, reported that he observed the accident airplane "enter a spin" and descend toward the ground "on the base leg near final." No distress calls were heard on the airport's common traffic advisory frequency.

Wreckage and impact signatures were consistent with an upright spin impact with terrain. Postaccident examination of the airplane and engine revealed that the upper spark plugs exhibited signatures consistent with a rich fuel/air mixture. No additional evidence of any preexisting anomalies that would have precluded normal operation were observed. Based on the available evidence, it could not be determined if the pilot had the electric fuel boost pump turned on during takeoff or at any time during the flight.

Review of the pilot's personal logbooks revealed that, over the past 38 years, he had only accumulated 71 hours of flight time, 5.3 hours of which were in the 90 days before the accident. In addition, no record of any flight time in the accident make/model airplane was found. Given the evidence, it is likely that the engine was running roughly and that this diverted the pilot's attention and led to his failure to

maintain adequate airspeed and to exceed the airplane's critical angle of attack, which resulted in an aerodynamic stall and subsequent spin while maneuvering from the base leg to final. Given the known preexisting engine problems, the pilot should not have conducted the flight in the airplane in which he had little experience flying.

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 sufficient airspeed and his exceedance of the airplane's critical angle of attack, which resulted in an aerodynamic stall and subsequent spin. Contributing to the accident was the pilot's diverted attention due to the rough running engine, which resulted from a rich fuel/air mixture, and the pilot's decision to conduct the flight in the airplane in which he had little experience flying despite knowing the airplane had preexisting engine problems.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained
Aircraft	(general) - Not specified
Personnel issues	Attention - Pilot
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Total experience w/ equipment - Pilot

Factual Information

History of Flight

Approach-VFR pattern base	Loss of control in flight (Defining event)
Approach-VFR pattern base	Collision with terr/obj (non-CFIT)

On October 2, 2015, about 1112 Pacific daylight time, an experimental amateur-built Coot A experimental amateur-built airplane, N69BD, was destroyed when it impacted terrain about 1 mile north of Deer Park Airport (DEW), Deer Park, Washington. The private pilot was fatally injured. The amphibious airplane was registered to and operated by the pilot as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions were reported near the accident site about the time of the accident, and no flight plan was filed. The local flight originated from DEW about 1110.

Another pilot reported that he had spoken to the accident pilot before the accident and that his crew had helped the pilot get the accident airplane out of the hangar. He noted that the accident pilot told him that he had been having fuel system problems and that there had been an airworthiness directive (AD) for the carburetor installed on the Franklin engine. The accident pilot said that he had purchased a fuel pump that had been installed on a Bell 47 helicopter with a Franklin engine and had a mechanic help him install it on the accident airplane. The accident pilot also stated that the challenge was that the accident airplane's fuel tanks were below the engine and that he had been having problems with carburetor priming, so he had installed an electric boost pump to prime the carburetor and hoped that the engine-driven fuel pump would maintain engine operation. The accident pilot added that, during engine ground runs with the electric boost pump on, the engine ran too "rich" and "rough." Therefore, the accident pilot planned to turn the electric boost pump off to see if it would work. The other pilot assumed that the accident pilot intended to do this on the ground, but it was unclear.

One witness, who was a rated pilot located adjacent to the accident site, reported that the airplane departed from runway 16 and that, while the airplane was on upwind, he heard the engine "sputtering." The airplane turned left and remained in the airport traffic pattern. Another witness, who was in an airplane in the airport traffic pattern, reported that he observed the accident airplane "enter a spin" and descend toward the ground "on the base leg near final." No distress calls were heard on the airport's common traffic advisory frequency.

Pilot Information

Certificate:	Private	**Age:**	79
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
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 7, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	71 hours (Total, all aircraft), 0.1 hours (Total, this make and model), 5.3 hours (Last 90 days, all aircraft)		

The pilot, age 79, held a private pilot certificate with an airplane single-engine land rating. The pilot was issued a third-class airman medical certificate on May 7, 2015, with the limitation that he "must wear corrective lenses, not valid for any class after."

Review of the pilot's personal logbook found within the wreckage revealed that he had accumulated a total flight time of 71 hours between 1977 and July 2015. In the 90 days before the accident, the pilot had logged 5.3 hours of flight time. The pilot's most recent flight review was completed on June 22, 2015.

Aircraft and Owner/Operator Information

Aircraft Make:	Johnson	**Registration:**	N69BD
Model/Series:	Coot A	**Aircraft Category:**	Airplane
Year of Manufacture:	2000	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	KK-6
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	July 1, 2015 Condition	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	48.9 Hrs at time of accident	**Engine Manufacturer:**	Franklin
ELT:		**Engine Model/Series:**	6A-350
Registered Owner:	On file	**Rated Power:**	200 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The two-seat, midwing, retractable gear, amphibious, experimental amateur-built airplane, serial number KK-6, was completed in 2000. It was powered by a 200-horsepower Franklin 6A-350-C2 engine, serial number T492. The airplane was equipped with a Hartzell HC-C2YF-1BLF adjustable-pitch propeller. Review of Federal Aviation Administration (FAA) registration information revealed that the owner

purchased the airplane on April 10, 2011.

A review of the airframe, engine, and propeller logbooks revealed that the most recent conditional inspection was completed on July 1, 2015, at a Hobbs/airframe total time of 48.9 hours and a propeller time since major overhaul of 302.6 hours. The conditional inspection logbook entry for the engine stated, in part, "…AD's complied with; 2003-05-01 Fuel Pump, see complete compliance listing in logs." On April 16, 2008, a conditional inspection was completed at a Hobbs time of 48.2 hours. Conditional inspections were also completed on April 24, 2010; April 10, 2011; and May 11, 2012, all at a Hobbs time of 48.9 hours. The observed Hobbs time at the accident site was 48.9 hours.

A review of AD 2003-05-01 revealed that compliance with the AD was required before further flight, unless already completed. The AD stated, in part, the following:
To prevent reduction or loss of engine power or external fuel leaks, do the following:

(a) Before further flight, remove diaphragm type AC4886 fuel pump, AC P/N [part number] 5656774, PZL P/N 26.11.1710. Type AC4886 pumps might have a metal tag with 4886 attached to a bolt on the upper cover. PZL-Rzeszow has issued Service Bulletin No. PZL-F/71/2002, dated August 2002 on this subject.

(b) After receipt of this AD, do not install diaphragm type AC4886 fuel pump, AC P/N 5656774, PZL P/N 26.11.1710.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KDEW,2191 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	17:53 Local	**Direction from Accident Site:**	193°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.01 inches Hg	**Temperature/Dew Point:**	17°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Deer Park, WA (DEW)	**Type of Flight Plan Filed:**	None
Destination:	Deer Park, WA (DEW)	**Type of Clearance:**	None
Departure Time:	11:10 Local	**Type of Airspace:**	Class G

At 1053, an automated weather observation station, located about 1 mile south of the accident site, reported wind variable at 3 knots, visibility 10 statute miles, clear sky, temperature 17° C, dew point 4° C, and an altimeter setting of 30.01 inches of Mercury.

Airport Information

Airport:	Deer Park Airport DEW	**Runway Surface Type:**	Asphalt
Airport Elevation:	2211 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16	**IFR Approach:**	None
Runway Length/Width:	6100 ft / 75 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	47.989723,-117.420829(est)

Examination of the accident site revealed that the airplane impacted a wooded area about 1 mile north of the airport. The airplane came to rest upright on a magnetic heading of about 225° adjacent to numerous 20-ft-tall trees. All major structural components of the airplane were located at the accident site. Numerous instruments and plexiglass pieces were located within about 50 ft of the main wreckage. Four trees located about 5 to 6 ft northeast of the main wreckage were topped. All other trees adjacent to the main wreckage appeared undamaged.

The fuselage came to rest upright and exhibited buckling and crushing from the forward portion of the airplane to just aft of the engine pylon. The engine pylon remained attached to the fuselage; however, it was displaced forward and to the left. The tailboom remained intact. The vertical stabilizer remained attached to the tailboom. The rudder remained partially attached to the vertical stabilizer. The skin of the rudder was torn open about midheight. The left horizontal stabilizer remained attached to the tailboom and was bent and buckled throughout. The left elevator remained attached via the outboard mount. The inboard portion of the left elevator was torn open. The trim tab remained attached via its mounts. The left brace tube was separated from the horizontal stabilizer. The area of separation was consistent with the impact damage. The right horizontal stabilizer was buckled and bent upward about 10° from the root. The right elevator remained attached via its mounts. The right brace tube remained attached to the horizontal stabilizer and tailboom.

The right wing remained attached to the fuselage via both the forward and aft mounts. The wing was twisted and came to rest in a leading-edge-low attitude. The bottom of the wing exhibited buckling, the fabric covering the wing was torn, and the internal wood ribs and spar were fractured. The inboard portion of the right wing was partially wrapped around the base of a tree that was about 7 to 8 inches in diameter. The right aileron remained attached via its mounts. The landing gear appeared to remain in the retracted position.

The left wing was separated from the inboard portion of the carry-through spar. The wing remained attached to the outboard portion of the carry-through spar and aft wing mounts. The entire wing structure was buckled throughout with multiple tears in the fabric. The wing was bent upward about midspan. The left aileron was separated from its mounts. The outboard wing tip was displaced and located wedged within a tree immediately forward of the left wing. The landing gear appeared to be in the retracted position.

Control continuity was established from the cockpit controls throughout the fuselage to all primary flight control surfaces. Throttle, mixture, and propeller control continuity was established from the cockpit controls to the engine mount pylon; however, impact damage at the engine pylon had resulted in the separation of the control cables.

The wreckage was recovered to a secure hangar for further examination.

Examination of the airframe revealed that the single fuel tank was impact damaged and breeched. No evidence of fuel was observed within the recovered portion of the fuel tank. The fuel tank pickup tube remained intact, and the screen was free of debris. Continuity of the fuel lines from the fuel tank to the engine was established. Compressed air was applied to the fuel lines, and no blockages were noted in the outlet lines to the engine. The airframe electric fuel boost pump was found separated from the fuel lines and exhibited impact damage. The fuel shutoff valve was observed in the "on" position. All of the fuel primer lines were intact. The airframe fuel filter (gascolator) was impact damaged, and the bowl was separated.

Examination of the engine revealed that it remained partially attached to the engine pylon. The engine was removed and slung from a forklift. The carburetor, vacuum pump, and alternator were separated from their mounts. The Nos. 2, 4, and 6 cylinders side intake manifold exhibited impact damage. The exhaust was intact and exhibited impact damage to the No. 2 cylinder exhaust stack.

The top spark plugs were removed and examined. The upper Nos. 1, 2, 4, 5, and 6 spark plugs exhibited black deposits within the electrode area. The upper No. 3 spark plug was slightly oil soaked, and black within the electrode area.

The propeller was rotated by hand. Thumb compression was obtained on the Nos. 1, 3, 4, 5, and 6 cylinders. The No. 2 cylinder exhibited impact damage to the cylinder head, which would not allow thumb compression to be obtained. Rotational continuity was established throughout the engine and valve train.

The left and right magnetos were removed. The drive shafts were rotated by hand, and spark was produced on all six posts.

The carburetor exhibited impact damage and was split into two pieces. The internal floats were intact. The throttle plate moved freely when the throttle lever was actuated by hand. The mixture arm moved partially by hand; however, it exhibited impact damage.

The propeller remained attached to the crankshaft. Propeller blade A appeared straight and exhibited

leading edge chordwise scratches from the blade tip inboard about 10 inches on the aft side of the propeller blade. The opposing blade, blade B, appeared straight and exhibited chordwise scratches to the outboard 3 inches of the forward and aft sides of the propeller blade.

The engine-driven fuel pump, airframe electrical fuel boost pump, bottom half of the carburetor, and all of the associated fuel lines were retained for further examination.

Medical and Pathological Information

The Spokane County Medical Examiner conducted an autopsy on the pilot. The medical examiner determined that the cause of death was "blunt…injuries."

The FAA's Civil Aerospace Medical Institute (CAMI) performed toxicology tests on specimens from the pilot. According to CAMI's report, the results were negative for carbon monoxide and volatiles and positive for salicylate in the urine. Testing for cyanide was not performed.

Tests and Research

The CJ Aviation 6005-2A engine-driven fuel pump and airframe electrical fuel boost pump were examined by the National Transportation Safety Board investigator-in-charge. An electric drill was attached to the engine-driven fuel pump, and the inlet fuel line was submerged in 100 low lead fuel. When the drill motor was turned on, fuel was observed flowing out of the outlet fuel port of the fuel pump. The inlet hose of the electrical fuel boost pump was then submerged in fuel. When electrical power was applied to the boost pump, fuel was observed expelling out of the outlet port of the fuel pump. No anomalies were observed with either fuel pump.

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Terrence Brewer; Federal Aviation Administration; Spokane, WA
Original Publish Date:	April 4, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=92101