



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Palatka, Florida	<b>Accident Number:</b>	ERA18LA097
<b>Date &amp; Time:</b>	March 6, 2018, 14:30 Local	<b>Registration:</b>	N45DC
<b>Aircraft:</b>	REILLY CHARLES W ESCAPADE	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	2 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The private pilot reported that, while on a 1-mile final approach for landing, about 400 ft above the ground, the engine lost total power. The pilot applied full throttle and enriched the mixture, but only a momentary return of power occurred before the engine lost power again. The airspeed decreased and the airplane entered an aerodynamic stall and impacted a house and terrain.

Postaccident examination of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures. The left wing fuel tank was empty, the right wing tank contained about 4 gallons of fuel, and the auxiliary tank contained just enough fuel to cover the bottom of the tank; however, there was evidence of fuel spillage at the site and the amount of fuel onboard before the accident could not be determined. Non-volatile memory data recorded during the accident flight revealed a large spike in fuel flow, followed by a 0 rpm reading, which was indicative of a total loss of engine power due to air passing through the fuel line and transducer rather than fuel. It is likely that the fuel flow to the engine was interrupted, but a postaccident examination of the engine and fuel system could not determine what caused the interruption.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The interruption of fuel to the engine during final approach, which resulted in a total loss of engine power due to fuel starvation, and the pilot's subsequent failure to maintain airspeed, which resulted in an aerodynamic stall.

## Findings

<b>Aircraft</b>	Fuel - Not specified
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Aircraft</b>	Airspeed - Not attained/maintained
<b>Aircraft</b>	Angle of attack - Capability exceeded

## Factual Information

### History of Flight

Approach-VFR pattern final	Loss of engine power (total) (Defining event)
Approach-VFR pattern final	Loss of control in flight
Approach-VFR pattern final	Aerodynamic stall/spin
Approach-VFR pattern final	Collision with terr/obj (non-CFIT)

On March 6, 2018, about 1430 eastern standard time, an experimental amateur-built Just Escapade, N45DC, was substantially damaged when it impacted terrain while on approach to the Palatka Municipal Airport (28J), Palatka, Florida. The private pilot and passenger sustained minor injuries. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight, which originated from Northeast Florida Regional Airport (SGJ), St. Augustine, Florida, about 1330.

According to the pilot, he topped-off the airplane's fuel tanks at SGJ, took off, and then flew southbound over the St. Johns River toward 28J. After maneuvering for about one hour, he entered a mid-field downwind in the traffic pattern at 28J for runway 27. As the airplane turned onto the final approach leg of the traffic pattern, the engine lost total power. The pilot reported that he checked the fuel shutoff valve, and verified it was on, added power, and applied the engine enrichener, which produced only a momentary burst of engine power. He added that "the airplane doesn't glide very well," airspeed decreased, and it entered an aerodynamic stall, descended, and impacted the roof of a house and trees about one mile from the runway threshold. The pilot reported that the engine was running "perfect" up until the loss of engine power.

The airplane came to rest in a backyard on its right side. The right wing was crushed forward and under the fuselage; the airplane's fuselage, wings, and vertical stabilizer sustained substantial damage.

According to Federal Aviation Administration (FAA) airworthiness records, the two-seat, high-wing, float equipped, single-engine airplane was manufactured in 2007. It was equipped with a 100-horsepower Rotax 912ULS engine, that was controlled by a throttle lever and enrichener. The airplane was not equipped with carburetor heat.

Postaccident examination of the airplane by an FAA inspector revealed that the fuel selector was found in the off position at the accident site, however, the pilot reported that after impact, he moved the fuel selector to the off position. The left-wing fuel tank was empty, and the right wing had about 3 gallons of fuel. Both tanks displayed evidence that fuel had leaked out post-impact, as an odor of fuel was present at the accident site. A red auxiliary fuel tank located behind the pilot and passenger seat was found with just enough fuel to cover the bottom of the 12-gallon tank. When examined, both carburetors displayed remnants of fuel inside their float bowls. Examination of the fuel system between the fuel tanks and the carburetors revealed the lines were clear and there were no mechanical anomalies (See Engine and Fuel System Factual Report in Docket).

The airplane was equipped with a Dynon Avionics, FlightDEK-D180 Super-Bright, Electronic Flight Instrument System (EFIS) and Engine Monitoring System (EMS), which recorded non-volatile memory from the flight. The data revealed normal engine and flight instrument parameters throughout the flight, until about 2 minutes prior to the accident, where fuel flow momentarily dropped to 0 and then returned to 2 gallons per hour (GPH). About 50 seconds later, fuel flow increased rapidly through 8 GPH, then 13 seconds later shows 57 GPH, and peaks at 102 GPH. When the fuel flow rose to 102 GPH, rpm rapidly decreased to 0 rpm, as the airplane was about 400 ft above ground level. The rpm remained at 0 rpm for the remainder of the recording, except for a momentary 2,500 rpm reading. The airplane's airspeed and altitude rapidly decreased a few seconds after the 0 rpm reading. The impact was about 25 seconds after the first 0 rpm reading (See EFIS and EMS Data Factual Report in docket).

An engine test-run was performed; the engine started with its own ignition system and original fuel. The engine produced power for a total of 2-3 minutes at different power settings. During the engine test, after the engine ran for about 30 seconds, the fuel source was removed. The engine ran for about two additional minutes without the fuel source connected, and then stopped.

The Dynon FlightDEK-D180 display was also monitored during the test-run. After the fuel source was removed, the fuel flow GPH reading decreased to 2-3 GPH, then further decreased to 0.0 GPH for one or two seconds. Subsequently, GPH rapidly rose to 99.9 GPH and remained steady at that reading until the engine ceased running. After the engine stopped, the GPH reading continued to display 99.9 GPH for about 5 seconds, and then decreased back to 0.0 GPH.

The airplane was equipped with an electronic fuel flow transducer, which measured the GPH rate of fuel passing through the fuel line via a spinning paddle. According to a transducer manufacturer, when air enters the flow transducer, the paddle wheel is free to spin at the velocity of the air that passes over the wheel, which is higher than fuel flow.

According to FAA airman records, the pilot held a private pilot certificate with ratings for airplane single-engine land and sea. His most recent FAA third-class medical certificate was issued in November 2016. He reported a total flight experience of 435 hours and 169 hours in the accident make and model airplane.

The weather conditions reported at Keystone Airpark (42J), Keystone Heights, Florida, 22 nautical miles from the accident site, at 1435, included a wind of 220° at 12 knots, gusting to 16 knots, visibility 10 statute miles, few clouds at 3,500 and 5,500 ft above ground level, temperature 24°C, and dew point 6°C.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	70,Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	November 30, 2016
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	June 8, 2016
<b>Flight Time:</b>	(Estimated) 435.1 hours (Total, all aircraft), 169.1 hours (Total, this make and model), 337.7 hours (Pilot In Command, all aircraft), 15.1 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 1.1 hours (Last 24 hours, all aircraft)		

## Passenger Information

<b>Certificate:</b>		<b>Age:</b>	Female
<b>Airplane Rating(s):</b>		<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>		<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>		<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	REILLY CHARLES W	<b>Registration:</b>	N45DC
<b>Model/Series:</b>	ESCAPADE NO SERIES	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2007	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	JAESC0116
<b>Landing Gear Type:</b>	N/A; Amphibian	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	August 12, 2017 Annual	<b>Certified Max Gross Wt.:</b>	1430 lbs
<b>Time Since Last Inspection:</b>	21 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	386 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Rotax
<b>ELT:</b>	Installed	<b>Engine Model/Series:</b>	912ULS
<b>Registered Owner:</b>		<b>Rated Power:</b>	100 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	K42J, 9 ft msl	<b>Distance from Accident Site:</b>	22 Nautical Miles
<b>Observation Time:</b>	14:35 Local	<b>Direction from Accident Site:</b>	300°
<b>Lowest Cloud Condition:</b>	Few / 3500 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	12 knots / 16 knots	<b>Turbulence Type Forecast/Actual:</b>	/ None
<b>Wind Direction:</b>	220°	<b>Turbulence Severity Forecast/Actual:</b>	/ N/A
<b>Altimeter Setting:</b>	29.93 inches Hg	<b>Temperature/Dew Point:</b>	24°C / 6°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	ST AUGUSTINE, FL (SGJ )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Palatka, FL (28J )	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	13:30 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	PALATKA MUNI - LT KAY LARKIN F 28J	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	47 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	27	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	6000 ft / 100 ft	<b>VFR Approach/Landing:</b>	Full stop;Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Minor	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Minor	<b>Latitude, Longitude:</b>	29.659444,-81.669166(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Gerhardt, Adam
<b>Additional Participating Persons:</b>	Robert Lasky; FAA/ FSDO; Orlando, FL
<b>Original Publish Date:</b>	March 18, 2019
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=96827">https://data.nts.gov/Docket?ProjectID=96827</a>

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).