



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Punta Gorda, Florida	Accident Number:	ERA19LA065
Date & Time:	December 13, 2018, 14:00 Local	Registration:	N145MM
Aircraft:	CZECH SPORT AIRCRAFT AS Piper Sport	Aircraft Damage:	Substantial
Defining Event:	Fuel related	Injuries:	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While on an extended base leg of the airport traffic pattern, the pilot reduced engine power and turned on the electrical auxiliary fuel pump; the engine then lost all power. He attempted to restart the engine but was unsuccessful. The pilot executed a forced landing to a field. During landing, the airplane struck a fence and utility pole and sustained substantial damage to both wings.

On-site examination of the airplane revealed that fuel was present in both fuel tanks after the accident. Postaccident examination of the airframe and test runs of the engine did not reveal any preimpact electrical or mechanical anomalies that would have precluded normal operation. During multiple engine test runs, the electric auxiliary fuel pump was cycled several times and operated normally.

A review of the recorded data captured by an engine monitor revealed that, during the accident flight, the oil temperature, cylinder head temperature, and exhaust gas temperature were all within the operating limits specified by the manufacturer. The fuel pressure and fuel flow values during cruise were within the normal range. When the engine lost power, the data showed a temporary decrease in fuel pressure below the minimum pressure specified by the engine manufacturer and subsequent decrease in the fuel flow to 0 gallons per hour. After impact, the fuel pressure returned to the normal range.

Because the engine operated satisfactorily after the accident both with and without the electric auxiliary fuel pump activated, it is unlikely that the engine lost power due to a fuel pump failure. During the accident flight, the recorded values for fuel flow were not abnormally high or erratic, and the cylinder head temperatures were below the maximum limit, so it was unlikely that air or vaporized fuel passed through the fuel flow sensor. An obstruction in the fuel system upstream of the fuel pressure sensor (or exhaustion of the fuel supply) could have

resulted in a loss of fuel pressure. However, an obstruction was unlikely because there were no indications of an obstruction during the postaccident engine examination, and fuel was present in the fuel tanks during and after the accident flight, and therefore the engine should not have lost power due to fuel exhaustion. Given this information, it is likely that the loss of engine power was due to an interruption of fuel flow to the engine, though the reason for the interruption could not be determined based on available information.

Probable Cause and Findings

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

A total loss of engine power due to an interruption of fuel flow.

Findings

Aircraft	Fuel - Unknown/Not determined
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Factual Information

History of Flight

Approach-VFR pattern final	Fuel related (Defining event)
Approach-VFR pattern final	Off-field or emergency landing
Landing-landing roll	Collision with terr/obj (non-CFIT)

On December 13, 2018, about 1400 eastern standard time, a Czech Sport Aircraft PiperSport, N145MM, was substantially damaged when it was involved in an accident near Punta Gorda, Florida. The sport pilot sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, the accident occurred on the second flight of the day. He departed Punta Gorda Airport (PGD), Punta Gorda, Florida, about 1015 with 29 gallons of 100 low lead aviation fuel on board and flew about 40 minutes to Winter Haven's Gilbert Airport (GIF), Winter Haven, Florida, uneventfully. He departed GIF about 1330 for the return flight to PGD. About 4 miles from PGD, at an altitude of 1,000 ft, the pilot was cleared to land on runway 15.

According to the pilot, while on an extended base leg of the traffic pattern, he turned on the electric auxiliary fuel pump as prescribed in the descent checklist. As soon as he activated the switch, the engine lost all power. He switched fuel tanks and attempted to restart the engine but was unsuccessful. Unable to reach the airport and at an altitude too low to deploy the airframe parachute, he selected a small field for a forced landing and advised the PGD control tower of his intention to conduct an emergency landing. During landing, the airplane struck a fence and a utility pole.

According to data logs downloaded from the airplane's Dynon EMS-D120 engine data monitor and EFIS-D100 electronic flight information system, the engine's fuel flow increased to its highest value of about 7 gallons per hour (GPH) during takeoff. After climbout, the cylinder head temperature remained below about 200°F for the duration of the flight. During cruise, the fuel flow was consistently between 5.5 and 6 GPH, and the fuel pressure values remained relatively constant (near 3.9 pounds per square inch [psi]) during the first portion of the cruise phase of flight. About halfway through the cruise phase, the fuel pressure decreased to about 2.9 psi, and then fluctuated between about 2.5 psi and 3.9 psi.

Near the end of the flight, the engine power decreased from about 4,700 rpm to 1,300 rpm over 52 seconds. Immediately afterward, engine power decreased to 0 rpm over 7 seconds, where it remained until impact about 40 seconds later (at the time the engine lost power, the recorded values for fuel quantity were 8.3 gallons in the left tank and 13.1 gallons in the right tank). Just as the rpm began to decrease from 1,300, the fuel pressure decreased from about 3.3 psi to 1.1 psi. As the fuel pressure decreased, the fuel flow increased momentarily from 1.9 GPH to 2.8

GPH before decreasing to 0 GPH. After impact, the fuel pressure increased to about 2.75 psi, where it remained until the recorded data ended, about 10 seconds later (see figure).

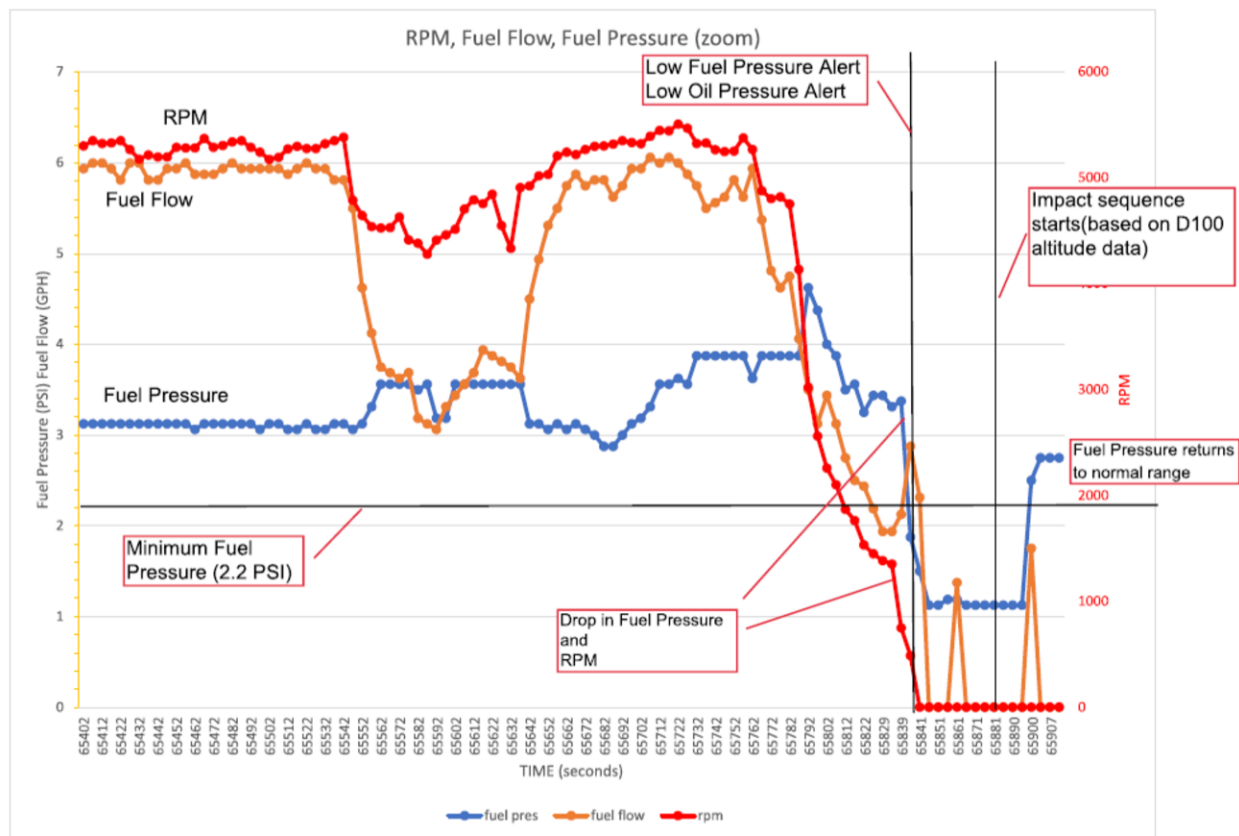


Figure - Selected data from engine monitor at end of flight.

The airplane was equipped with an engine-driven mechanical fuel pump and an electric auxiliary fuel pump. In August 2018, the manufacturer issued Safety Directive SA-SC-011, which amended the pilot's operating handbook to indicate "The electrical fuel pump shall be ON during engine start, engine warm up, taxiing, take-off, climb, approach and landing." Prior to this directive, the pilot's operating handbook prescribed use of the electric auxiliary fuel pump only during engine start.

A review of the engine data from the previous flight revealed that the fuel pressure values remained relatively constant (about 3.9 psi) for the duration of the cruise phase. During climbout on the second previous flight, the fuel pressure decreased from about 3.5 psi to 2.5 psi over about 30 seconds. During the cruise phase, the fuel pressure increased to about 3.5 psi and remained relatively constant for the remainder of the cruise phase.

On-site examination of the wreckage by a Federal Aviation Administration inspector revealed that all major components of the airplane were present at the accident site. The right wing was substantially damaged outboard of the wing root, and a section outboard of the flap was completely separated. The left wing was substantially damaged aft of the spar and forward of

the flap at the wing root, and along the entire chord outboard of the aileron. An unquantified amount of fuel was present in both the left and right fuel tanks.

Postaccident examination of the engine revealed that there were no obstructions to the air intake or the exhaust. All ignition leads were secure and intact. The top spark plugs were removed and appeared “worn normal.” Thumb compression was observed on all cylinders. A borescope examination of each cylinder revealed no damage to the piston tops, cylinder walls or valves.

An external fuel source was plumbed to supply fuel to the engine. The engine was started, a run-up was performed, and the engine operated normally up to full power. The electric auxiliary fuel pump was cycled on and off several times during the engine run. No anomalies were noted. The engine was shut down, restarted, and run two more times.

According to the engine’s operating manual, the upper operating limit of the cylinder head temperature was 275°F, the minimum fuel pressure was 2.2 psi, and the minimum idle speed was 1,400 rpm. A review of the recorded data revealed that, during the accident flight, the oil temperature, cylinder head temperature, and exhaust gas temperature were all within the operating limits specified by the manufacturer.

Pilot Information

Certificate:	Private; Sport Pilot	Age:	76, Male
Airplane Rating(s):	Single-engine land; Multi-engine land; Multi-engine sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Sport pilot Without waivers/limitations	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	January 31, 2017
Flight Time:	(Estimated) 2500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CZECH SPORT AIRCRAFT AS	Registration:	N145MM
Model/Series:	Piper Sport	Aircraft Category:	Airplane
Year of Manufacture:	2010	Amateur Built:	
Airworthiness Certificate:	Special light-sport (Special)	Serial Number:	P1001063
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	November 8, 2018 Condition	Certified Max Gross Wt.:	1329 lbs
Time Since Last Inspection:	8 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	552 Hrs as of last inspection	Engine Manufacturer:	Bombardier Rotax
ELT:	Installed, not activated	Engine Model/Series:	912ULS
Registered Owner:		Rated Power:	100 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:	PGD,30 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	13:25 Local	Direction from Accident Site:	120°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	15 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	150°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	26°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Winter Haven, FL (GIF)	Type of Flight Plan Filed:	None
Destination:	Punta Gorda, FL	Type of Clearance:	VFR;Traffic advisory
Departure Time:	13:30 Local	Type of Airspace:	Class C

Airport Information

Airport:	Punta Gorda PGD	Runway Surface Type:	Asphalt
Airport Elevation:	25 ft msl	Runway Surface Condition:	Dry
Runway Used:	15	IFR Approach:	None
Runway Length/Width:	5680 ft / 150 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	26.925277,-82.001113(est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass		
Additional Participating Persons:	Linda Williams; FAA/FSDO ; Tampa, FL		
Original Publish Date:	January 20, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98769		

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](#).