



Aviation Investigation Final Report

Location:	FORT LAUDERDALE, Florida	Accident Number:	ERA19LA137
Date & Time:	March 24, 2019, 11:01 Local	Registration:	N944BT
Aircraft:	Pilatus PC12	Aircraft Damage:	Substantial
Defining Event:	Aircraft structural failure	Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During the climb to cruise altitude on a cross-country flight, the pilot heard a loud bang and the pilot's side windshield shattered and the cabin began depressurizing. The pilot returned to the departure airport and landed uneventfully, where he noticed that the seal was extruded in two places around the outer pane. The windshield was sent to the manufacturer for a detailed examination, which revealed that 80% of the fiberglass straps were missing, and they were likely removed by maintenance personnel. A combination of missing straps and heavy delamination caused the outboard ply to become detached from the edge attachment. Moisture ingress at the bottom aft edge caused delamination and arcing. There was no record in the airframe logbook of the straps' removal.

Probable Cause and Findings

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

Improper maintenance of the windshield, which resulted in delamination and in-flight depressurization.

Findings

Aircraft	Flight compartment windows - Malfunction
Personnel issues	Repair - Maintenance personnel

Factual Information

History of Flight

Enroute-climb to cruise

Aircraft structural failure (Defining event)

On March 24, 2019, about 1101 eastern daylight time, a Pilatus PC-12/45, N944BT, was substantially damaged when the pilot's windshield shattered while flying near Fort Lauderdale, Florida. The commercial pilot and two passengers were not injured. Visual meteorological conditions prevailed, and an instrument flight plan was filed for the flight that originated from the Fort Lauderdale Executive Airport (FXE), Fort Lauderdale, Florida, and was destined for Moore-Murrell Airport (MOR), Morristown, Tennessee. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

According to the pilot, he was climbing through 20,000 ft when he heard a loud bang and the pilot-side windshield shattered. He immediately notified air traffic control that he was returning to FXE and needed to descend. After landing uneventfully, he examined the windshield and noticed that the seal was extruded in two places around the outer pane.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that the pilot-side windshield was shattered but was still attached to the airplane. The bottom left corner and upper corner of the windshield were pushed outward, and the seal around the windshield was torn. The lower left heating element was burnt.

The windshield was sent to the manufacturer for further examination. The examination revealed that about 80% of the fiberglass straps were missing and had been removed by maintenance personnel. The missing straps caused the outboard ply to become detached from the edge attachment. Moisture was then able to ingress the bottom aft edge causing delamination and then allowing arcing to occur.

Investigators were unable to determine when these straps were removed, as there was no record of this maintenance in the airframe logbooks. The Pilatus Windows Inspection Check referred to the PPG service information letter which states specifically the straps should not be removed, rather repaired following their prescribed maintenance plan.

The pilot held a commercial pilot certificate with ratings for airplane single-engine land, single-engine sea, and multi-engine land. His most recent FAA third-class medical certificate was issued on November 15, 2017. He reported 9,000 total hours of flight experience, of which 2,600 hours were in the PC-12.

The airplane was manufactured in 2002. It was powered by a Pratt and Whitney PT6A-67, 1,250-horsepower engine, equipped with a four-bladed Hartzell propeller. Its most recent annual inspection was completed on January 15, 2019.

Pilot Information

Certificate:	Commercial; Flight instructor	Age:	73, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	November 15, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	May 23, 2018
Flight Time:	9000 hours (Total, all aircraft), 2600 hours (Total, this make and model), 9000 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Pilatus	Registration:	N944BT
Model/Series:	PC12 45	Aircraft Category:	Airplane
Year of Manufacture:	2002	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	468
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	January 15, 2019 Annual	Certified Max Gross Wt.:	9965 lbs
Time Since Last Inspection:	10 Hrs	Engines:	1 Turbo prop
Airframe Total Time:	2558 Hrs at time of accident	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	C126 installed, not activated	Engine Model/Series:	PT6A-67B
Registered Owner:		Rated Power:	1250 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:	FXE, 14 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	11:00 Local	Direction from Accident Site:	348°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.1 inches Hg	Temperature/Dew Point:	24°C / 16°C
Precipitation and Obscuration:			
Departure Point:	Fort Lauderdale, FL (FXE)	Type of Flight Plan Filed:	IFR
Destination:	Morristown, TN (KMOR)	Type of Clearance:	IFR
Departure Time:	10:00 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	26.071388,-80.14167

Administrative Information

Investigator In Charge (IIC):	Boggs, Daniel		
Additional Participating Persons:	Jimmey Mygatt; FAA; Miramar, FL Connie Little; PPG; Huntsville, AL		
Original Publish Date:	December 3, 2020	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=99173		

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