



Aviation Investigation Final Report

Location:	Bartow, Florida	Accident Number:	ERA18LA265
Date & Time:	September 28, 2018, 13:25 Local	Registration:	N4592X
Aircraft:	Piper PA32	Aircraft Damage:	Substantial
Defining Event:	Powerplant sys/comp malf/fail	Injuries:	2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot reported that during cruise flight, the engine began to run roughly. The No. 3 cylinder then separated from the airplane; the engine lost all power, and oil began to cover the windshield. The pilot flew via instruments and landed in a marsh; the right wing of the airplane separated after contacting a tree. Postaccident engine examination revealed impact marks on the engine crankcase where the No. 3 cylinder would have been secured. The marks were consistent with the cylinder impacting the case multiple times. The examination also revealed that several of the nuts on other cylinders were well below the required 50 ft-lbs of torque. The engine's most recent overhaul was completed about 12 years before the accident, and the engine had accrued about 366 hours since that overhaul; there was no record of cylinder removal or replacement since the engine overhaul. It is likely that undertorqued cylinder nuts allowed the cylinder to come loose and separate from the engine. The investigation could not determine if the undertorqued condition of the cylinder nuts was the result of an improper overhaul or possible improper undocumented maintenance after the overhaul.

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 after the separation of the No. 3 cylinder from the crankcase due to improper maintenance.

Findings

Personnel issues	(general) - Maintenance personnel
Aircraft	Recip eng cyl section - Incorrect service/maintenance

Factual Information

History of Flight

Enroute-cruise	Powerplant sys/comp malf/fail (Defining event)
Enroute-cruise	Loss of engine power (total)
Emergency descent	Off-field or emergency landing
Landing	Collision with terr/obj (non-CFIT)

On September 28, 2018, about 1325 eastern daylight time, a Piper PA-32-300, N4592X, operated by the private pilot, was substantially damaged during a forced landing to a marsh, following a total loss of engine power during cruise flight near Bartow, 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 an instrument flight rules flight plan was filed for planned flight to Tampa Executive Airport (VDF), Tampa, Florida. The flight originated from Boca Raton Airport (BCT), Boca Raton, Florida, about 1230.

The pilot reported that during cruise flight, the engine began to run rough. He notified air traffic control (ATC) and declared an emergency. Shortly thereafter, the engine cowling separated and the pilot observed that a cylinder had separated as oil began to cover the windscreen. Although ATC provided vectors to the nearest airport, the pilot could not see due to the oil, and flew via the instruments to the ground.

Examination of the accident site by a Federal Aviation Administration inspector revealed that during the landing in a marsh, the right wing contacted a tree and separated. The inspector also observed that the No. 3 cylinder had separated. Further examination of the engine following recovery revealed impact marks on the engine crankcase where the No. 3 cylinder secured to it. The marks were consistent with the cylinder impacting the case multiple times. The examination also revealed that several of the other cylinder nuts were below the required 50 ft/lbs of torque.

The six-seat, low-wing, fixed-tricycle-gear airplane was manufactured in 1975. It was powered by a Lycoming IO-540, 300-horsepower engine, equipped with a constant-speed, two-blade Hartzell propeller. Review of maintenance records revealed that the engine's most recent overhaul was completed on November 14, 2006. The airplane's most recent annual inspection was completed on March 16, 2018. At the time, the engine had accrued 353.58 hours since the overhaul. There was no record of any cylinder removal or replacement since the engine overhaul. The airplane had flown about 13 additional hours from the time of the most recent annual inspection, until the accident.

Pilot Information

Certificate:	Private	Age:	70,Male
Airplane Rating(s):	Single-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):	None	Toxicology Performed:	No
Medical Certification:	BasicMed	Last FAA Medical Exam:	December 8, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	September 28, 2017
Flight Time:	465 hours (Total, all aircraft), 382 hours (Total, this make and model), 465 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N4592X
Model/Series:	PA32 300	Aircraft Category:	Airplane
Year of Manufacture:	1975	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	32-7640039
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	March 16, 2018 Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:	13 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	4047 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540-K1A5
Registered Owner:		Rated Power:	300 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:	BOW,125 ft msl	Distance from Accident Site:	5 Nautical Miles
Observation Time:	13:56 Local	Direction from Accident Site:	90°
Lowest Cloud Condition:	Scattered / 3000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	32°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Boca Raton, FL (BCT)	Type of Flight Plan Filed:	IFR
Destination:	Tampa, FL (VDF)	Type of Clearance:	IFR
Departure Time:	12:30 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	1 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	27.937221,-81.855552(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Marco Grillo; FAA/FSDO; Orlando, FL
Original Publish Date:	November 19, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98373

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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](#).