



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Millbury, Ohio	Accident Number:	CEN15LA318
Date & Time:	July 25, 2015, 09:10 Local	Registration:	C-GTAO
Aircraft:	Piper PA38 - 112	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Shortly after takeoff, the pilot declared a "mayday" and reported to air traffic control that he needed to return to the airport. The airplane crashed in an open field about ½ mile from the airport. The pilot initially survived the accident but later died from his injuries. A postaccident examination of the engine revealed the valve adjustment mechanisms (jam nut and screw) on two of the intake valves and on one of the exhaust valves were backed off. The valve spring retainer on one of the intake valves was broken, and two of the cylinder head gaskets were compromised. The spark plugs were fouled. Given the postaccident condition of the engine, the pilot most likely was returning to the airport due to a loss of engine power. Maintenance records show the engine had an annual inspection about 25 flight hours before the accident. The condition of the valve adjustment mechanisms suggests that either the tappet adjustment was not checked, as recommended by the manufacturer, or the torque on the jam nuts was incorrect.

Probable Cause and Findings

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

A loss of engine power due to three of the engine valve adjustment mechanisms backing out, which resulted from improper maintenance.

Findings

Aircraft	(general) - Incorrect service/maintenance
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Enroute-climb to cruise	Loss of engine power (partial) (Defining event)
Landing-flare/touchdown	Collision with terr/obj (non-CFIT)

On July 25, 2015, about 0910 eastern daylight time, a Piper PA-38-112, Canadian registration C-GTAO, collided with the terrain in Millbury, Ohio, while attempting to return to the Toledo Executive Airport (TDZ), Toledo, Ohio. The pilot was seriously injured and succumbed to those injuries on August 5, 2015. The airplane was substantially damaged. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight. The flight originated from TDZ just prior to the accident and the intended destination was the Region of Waterloo International Airport (CYKF), Ontario, Canada.

After takeoff, the pilot contacted air traffic control and requested flight following. Shortly after radar contact was established, the pilot reported a "mayday" over the air traffic control frequency. The pilot stated that he needed to return to the airport and that he did not require any assistance. The airplane impacted a corn field about 1/2 mile east of the approach end of runway 32 at TDZ.

Personnel Information

The pilot held a private pilot certificate with a single-engine land rating. He was issued a third class airman medical certificate on December 8, 2014, with a limitation for corrective lenses.

A copy of a pilot logbook was provided during the investigation. The first entry in the logbook was dated June 10, 2009. The logbook began with 492 hours of flight time carried over. The last entry in the logbook was dated July 24, 2015. The pilot's total flight time as of that date was 1,103.1 hours. Of the 611 flight hours documented in the logbook, 605 hours were in the accident airplane. The pilot had his last flight review on January 19, 2015.

Aircraft Information

The accident airplane was a Piper PA-38-112, serial number 38-79A1002. The PA-38-112 is a single-engine, two-place airplane, with tricycle landing gear. The airplane was powered by a 112-horsepower, Lycoming O-235-L2C, four-cylinder, reciprocating engine, serial number L-19639-15. The airplane was equipped with a two-blade Sensenich model 72CK-O-56 propeller assembly. Prior to October 2004, the aircraft held German registration number D-ETAV.

The last aircraft and engine annual inspections were completed on March 18, 2015, at a total time of 1,720.5 hours. A flight log indicated the aircraft total time on the day before the accident was 1,745.6. The hour meter at the time of the accident was 1,097.3 and the tachometer time was 312.5.

According to maintenance records, the emergency locator transmitter (ELT) was checked on February 6, 2015. The ELT was in the armed position and the battery expiration date on the label was April 2015. There were no reports of the ELT having activated during the accident.

The accident occurred on the first flight since the fuel tanks were filled the day before.

Weight and Balance calculations for the accident flight indicate the airplane was about 29.5 pound over the maximum allowable gross weight.

Meteorological Information

The TDZ Automated Surface Observing System (ASOS), is located about 1 miles from the accident site. At 0953, the TDZ ASOS recorded weather conditions as: wind from 230 degrees at 11 knots; visibility 10 miles or greater; clear sky; temperature 26 degrees Celsius (C); dew point 17 degrees C; altimeter 29.97 inches of mercury.

Wreckage and Impact Information

The airplane came to rest in an open field which contained a young corn crop. The empennage was separated just aft of the cockpit area. The left wing sustained minor damage. The right wing was partially separated at the fuselage. The outboard section of the wing was twisted upward and back. The leading edge of the wing was crushed. The engine cowling was crushed rearward. The cockpit area remained intact.

The wreckage was examined by inspectors from the Federal Aviation Administration (FAA) who reported the following:

The flight controls remained attached to their respective surfaces. Flight control continuity was established. The flaps were extended to the first notch.

The propeller gear was separated from the crankshaft. The oil dipstick was secured in the filler tube which was broken at its base. The dipstick indicated there were 4 quarts of oil in the engine. The left and right cowl doors contained an oil film. The right rear engine accessories, accessory cover, crankcase, battery box, and engine mount contained an oil film. No oil was visible on the windscreen or on the outside of the fuselage.

An engine examination revealed fuel was present in the carburetor. The spark plugs were fouled to the point that the electrodes were bridged. The crankshaft was rotated by hand. One cylinder exhibited strong compression. Another cylinder exhibited minimal compression and the remaining two cylinders had no compression. The No.1 cylinder exhaust valve adjustment mechanism (jam nut and screw) was laying loose in the cylinder head cover. The No.3 cylinder intake valve adjustment mechanism was backed off the rocker arm. The No.4 cylinder intake valve adjustment mechanism jam nut was backed off the rocker arm and the valve spring retainer was broken. The cylinder head gaskets on the No. 3 and No. 4 cylinders were puckered and leaking. The valve clearance and engine timing were out of tolerance.

Medical and Pathological Information

The pilot initially survived the accident, but succumbed to his injuries on August 5, 2015. The NTSB was not immediately notified of the pilot's death; therefore, an autopsy and toxicological tests were not requested.

Additional Information

Lycoming Service Instruction 1068A recommends that the tappet clearance should be checked after each 100 hours of operation. The instructions stated the jam nuts should be torqued to 450 inch pounds.

Pilot Information

Certificate:	Private	Age:	67,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	December 8, 2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	1103 hours (Total, all aircraft), 34.9 hours (Last 90 days, all aircraft), 23.7 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	C-GTAO
Model/Series:	PA38 - 112	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	38-79A1002
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	March 18, 2015 Annual	Certified Max Gross Wt.:	1670 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	1745.6 Hrs	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-235-L2A
Registered Owner:		Rated Power:	112 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:	TDZ,623 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	09:53 Local	Direction from Accident Site:	160°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	230°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.96 inches Hg	Temperature/Dew Point:	26°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Toledo, OH (KTDZ)	Type of Flight Plan Filed:	
Destination:	Breslau Ontario (CYKF)	Type of Clearance:	None
Departure Time:	09:06 Local	Type of Airspace:	Class E

Airport Information

Airport:	Toledo Executive Airport TDZ	Runway Surface Type:	
Airport Elevation:	120 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	41.560001,-83.466667(est)

Administrative Information

Investigator In Charge (IIC):	Sullivan, Pamela
Additional Participating Persons:	Kenneth Shauman; FAA; Cleveland, OH James Larry; FAA; Cleveland, OH
Original Publish Date:	December 12, 2016
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=91639

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](#).