



National Transportation Safety Board Aviation Accident Final Report

Location:	Toone, TN	Accident Number:	ERA17LA019
Date & Time:	10/09/2016, 1050 CDT	Registration:	N65903
Aircraft:	CESSNA 182	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The private pilot reported that, about 3 hours into a cross-country flight, an instrument panel warning sounded and the oil pressure indicator was in the red arc; however, the engine continued to run smoothly. The pilot began to look for airports or fields to divert to and notified air traffic control of the abnormal engine indication. A few minutes later, the pilot heard "clanging" noises from the engine and it subsequently lost partial power. The engine was not producing enough power for the airplane to fly to the destination airport, and the pilot performed a forced landing in a field. During the forced landing, the airplane sustained substantial damage. Examination of the engine revealed that the No. 3 cylinder exhaust valve had stuck in the closed position, which resulted in failure of the cylinder's valvetrain components, breach of the rocker box cover, and the engine's oil supply being exhausted through the breached rocker box cover. The resulting oil starvation subsequently resulted in a partial loss of engine power.

Probable Cause and Findings

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

A stuck No. 3 cylinder exhaust valve, which resulted in failure of the cylinder's valvetrain components, breach of the cylinder's rocker box cover, and partial loss of engine power due to oil starvation.

Findings

Aircraft	Recip eng cyl section - Failure (Cause) Engine (reciprocating) - Damaged/degraded (Cause) Oil - Fluid level (Cause)
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Factual Information

On October 9, 2016, about 1050 central daylight time, a Cessna 182T, N65903, was substantially damaged during a forced landing in a field, following a partial loss of engine power during cruise flight near Toone, Tennessee. The private pilot was not injured. The personal flight conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight that that originated from Destin Executive Airport (DTS), Destin, Florida, about 0730. The flight was destined to McKeller-Sipes Regional Airport (MKL), Jackson, Tennessee.

The pilot reported that while in cruise flight at 4,000 feet mean sea level, nearing the destination airport, an instrument panel warning sounded and the oil pressure indicator was in the red arc; however, the engine was running smoothly. The pilot began to look for airports or fields to divert to and notified air traffic control (ATC) of the abnormal engine indication. The pilot then requested, and ATC approved a direct course to the destination airport. A few minutes later, a light "clanging" noise was heard from the engine and the pilot alerted ATC that the airplane did indeed have an engine problem. The controller then advised the pilot that there was a private airstrip 5 miles west of his position and the pilot attempted to divert to that airstrip. The "clanging" noise grew louder and the engine did not have enough power to reach the private airstrip. The pilot then performed a forced landing in a field. During the landing, the airplane encountered uneven terrain, which collapsed the nose landing gear.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that the firewall had sustained damage. The inspector also noted that the engine's No. 3 cylinder had suffered a catastrophic failure. Examination of photos provided by the inspector revealed evidence of oil on the exterior of the engine and exhaust system in the immediate vicinity of the No. 3 cylinder. The inspector added that the No. 3 cylinder exhaust valve was stuck in the closed position. The No. 3 cylinder was retained and forwarded to the NTSB Materials Laboratory, Washington, D.C. Examination of the No. 3 cylinder revealed that the rocker arm shaft bosses, bushings, and exhaust valve keeper were fractured. The rocker arm cover was fractured and bent outward. All of the fracture surfaces exhibited features consistent with overstress failure. No indications of pre-existing damage, such as corrosion or fatigue cracking, were observed. Dimensional review of the stuck exhaust valve revealed that it exhibited deposits on its surface up to 0.006-inch thick.

The four-seat, high-wing, fixed-tricycle gear airplane was manufactured in 2004. It was equipped with a Lycoming IO-540, 230-horsepower engine. The airplane's most recent annual inspection was completed on July 12, 2016. At that time, the engine had accumulated 2,188.6 hours since new. The airplane had flown 79.8 hours from the time of the inspection, until the accident, which resulted in 2,268.4 total engine hours since new at the time of the accident. The manufacturer recommended overhaul time for the make and model engine was 12 years or 2,000 hours, whichever occurred first.

Review of an engine data plot for the accident flight revealed that the engine monitor was indicating that the No. 3 cylinder was about two-thirds below the exhaust gas temperature and

cylinder head temperature of the other five cylinders during the entire approximate 3-hours cruise portion of the accident flight.

History of Flight

Enroute-cruise	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	40, Male
Airplane Rating(s):	Multi-engine Land; 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:	Class 3 Without Waivers/Limitations	Last FAA Medical Exam:	04/07/2016
Occupational Pilot:	No	Last Flight Review or Equivalent:	08/29/2016
Flight Time:	369 hours (Total, all aircraft), 236 hours (Total, this make and model), 251 hours (Pilot In Command, all aircraft), 73 hours (Last 90 days, all aircraft), 26 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N65903
Model/Series:	182 T	Aircraft Category:	Airplane
Year of Manufacture:	2004	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	18281501
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	07/12/2016, Annual	Certified Max Gross Wt.:	3110 lbs
Time Since Last Inspection:	80 Hours	Engines:	1 Reciprocating
Airframe Total Time:	2268 Hours at time of accident	Engine Manufacturer:	LYCOMING
ELT:	C91A installed, activated, aided in locating accident	Engine Model/Series:	IO-540-AB1A5
Registered Owner:	EASY AVIATION LLC	Rated Power:	230 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MKL, 434 ft msl	Distance from Accident Site:	16 Nautical Miles
Observation Time:	1053 CDT	Direction from Accident Site:	5°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	14 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	50°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30.36 inches Hg	Temperature/Dew Point:	21 °C / 4 °C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Destin, FL (DTS)	Type of Flight Plan Filed:	IFR
Destination:	Jackson, TN (MKL)	Type of Clearance:	IFR
Departure Time:	0730 CDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	35.320000, -88.950000 (est)

Administrative Information

Investigator In Charge (IIC):	Robert J Gretz	Report Date:	09/10/2018
Additional Participating Persons:	David D Hays; FAA/FSDO; Memphis, TN		
Publish Date:	09/10/2018		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=94232		

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](#).