



Aviation Investigation Final Report

Location:	Hobe Sound, Florida	Accident Number:	ERA19LA258
Date & Time:	August 23, 2019, 09:46 Local	Registration:	N80WH
Aircraft:	Beech F33	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During low-altitude cruise flight, the engine lost total power and the pilot performed a forced landing on an embankment next to a road, resulting in substantial damage to the right wing, right tip tank, and right elevator. Postaccident examination of the engine revealed that the crankshaft was fractured between the No. 2 main bearing journal and the No. 2 connecting rod journal and exhibited evidence of lubrication distress. Additionally, the No. 2 bearing had shifted, and a large portion of the bearing had extruded from the bearing support. The bearing support mating surfaces displayed fretting and the lock tab had completely worn away. Based on the observed damage, it is likely that the No. 2 main bearing shifted, resulting in inadequate lubrication to, and subsequent failure of, the crankshaft.

While the crankcase mating surfaces displayed unapproved sealant material with no signs of silk thread, which was not consistent with the engine manufacturer's guidance for engine assembly, the breakaway through bolt torque remained at or above the manufacturer's specification. It could not be definitively determined, based on available evidence, if the use of an unapproved sealant contributed to the bearing shift.

Probable Cause and Findings

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

A bearing shift, which resulted in a loss of lubrication to the crankshaft, the failure of the crankshaft, and a total loss of engine power.

Findings

Aircraft

Recip engine power section - Failure

Factual Information

History of Flight

Enroute-cruise

Loss of engine power (total) (Defining event)

On August 23, 2019, about 0946 eastern daylight time, a Beech, F33A, N80WH, was substantially damaged when it was involved in an accident near Hobe Sound, Florida. The private pilot and two passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that his preflight inspection of the airplane revealed no anomalies and that he departed on the flight to look at properties. While in cruise flight, he heard a “tap, tap, tap, tap and a bang” and recalled the engine oil pressure gauge reading 0. The airplane was below 1,000 ft mean sea level (msl), and he began looking for a forced landing site. The pilot flew under powerlines, performed a forced landing on the embankment next to the roadway, and the airplane continued to slide until it came to rest. The airplane sustained substantial damage to the right wing, right tip tank, and right elevator.

According to the airframe maintenance logbook, the airplane’s most recent annual inspection was completed on April 21, 2018, at a total time of 4,591.2 hours. The most recent 100-hour inspection was completed on May 17, 2019, at an aircraft total time of 4,670.6 hours. At that time, the oil and oil filter were replaced. The logbook entry included that the filter was cut open and “no defects were noted.” The aircraft total time at the time of the accident was 4,674.7 hours. According to the engine logbook, the engine had accrued 1,139.1 hours since it was overhauled on August 1, 2004.

Examination of the engine revealed that the engine crankcase displayed a crack near the aft section of the spine. All 12 through bolt torque values were above the manufacturer's recommended torque values of 490 to 510 in-lbs torque. The outer crankcase mating surfaces displayed evidence of an unapproved sealant material with no signs of silk thread. The area around the Nos. 1 and 2 bearing support through bolt holes displayed a significant amount of fretting between the mating surfaces, while the Nos. 3 and 4 bearing support mating surfaces also displayed some fretting. The No. 1 bearing support displayed minor lock tab elongation, while the No. lock tab had completely worn away. The Nos. 1 and 2 bearings displayed signatures consistent with bearing shift, with the No. 2 bearing displaying the most movement. A large portion of the No. 2 bearing had extruded from the bearing support. The crankshaft was fractured between the No. 2 main bearing journal and the No. 2 connecting rod journal. Both sides of the crankshaft fracture surface exhibited thermal discoloration and incipient signatures of lubrication distress.

The maintenance and overhaul manual for the IO-550-B engine described the proper assembly procedures. This section provided part numbers for approved sealant and grade silk thread to be used during assembly. The manual also warned against using unapproved sealants, stating:

WARNING

Do not apply any form of sealant to the crankcase cylinder deck, chamfer, cylinder mounting flange, cylinder base O-ring, cylinder fastener threads or crankcase main bearing bosses. The use of RTV, silicone, Gasket Maker or any other sealant on the areas listed above during engine assembly will cause a loss of cylinder deck stud or through-bolt torque. Subsequent loss of cylinder attachment load, loss of main bearing crush and/or fretting of the crankcase parting surfaces will occur. The result will be cylinder separation, main bearing movement, oil starvation and catastrophic engine failure. USE ONLY CLEAN 50 WEIGHT AVIATION ENGINE OIL ON SURFACES LISTED.

Pilot Information

Certificate:	Private	Age:	76, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	June 11, 2019
Occupational Pilot:	No	Last Flight Review or Equivalent:	June 9, 2019
Flight Time:	3037.6 hours (Total, all aircraft), 2339.6 hours (Total, this make and model), 2991.8 hours (Pilot In Command, all aircraft), 4 hours (Last 90 days, all aircraft), 0.5 hours (Last 30 days, all aircraft)		

Passenger Information

Certificate:		Age:	Male
Airplane Rating(s):		Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	Lap only
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:			

Passenger Information

Certificate:	Age:	Male
Airplane Rating(s):	Seat Occupied:	Right
Other Aircraft Rating(s):	Restraint Used:	4-point
Instrument Rating(s):	Second Pilot Present:	No
Instructor Rating(s):	Toxicology Performed:	
Medical Certification:	Last FAA Medical Exam:	
Occupational Pilot:	Last Flight Review or Equivalent:	
Flight Time:		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N80WH
Model/Series:	F33 A	Aircraft Category:	Airplane
Year of Manufacture:	1974	Amateur Built:	
Airworthiness Certificate:	Utility	Serial Number:	CE-504
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	May 17, 2019 Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:	4 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	4674.7 Hrs at time of accident	Engine Manufacturer:	Continental
ELT:	C126 installed	Engine Model/Series:	IO-550B
Registered Owner:	On file	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:	SUA,18 ft msl	Distance from Accident Site:	11 Nautical Miles
Observation Time:	09:47 Local	Direction from Accident Site:	327°
Lowest Cloud Condition:	Scattered / 1500 ft AGL	Visibility	7 miles
Lowest Ceiling:	Broken / 2300 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	12 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	30°C / 25°C
Precipitation and Obscuration:	Moderate - Showers - Rain		
Departure Point:	Stuart, FL (SUA)	Type of Flight Plan Filed:	None
Destination:	Stuart, FL (SUA)	Type of Clearance:	None
Departure Time:	09:20 Local	Type of Airspace:	Class G

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:	27.032777,-80.111389(est)

Administrative Information

Investigator In Charge (IIC):	Wentz, Peter
Additional Participating Persons:	Kurt Gibson; Continental Aerospace Technologies; Mobile, AL Carlos Enriquez; FAA / FSDO; Miramar, FL
Original Publish Date:	April 21, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100131

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).