Aviation Investigation Final Report

Location:	Heavner, Oklahoma	**Accident Number:**	CEN22LA140
Date & Time:	March 12, 2022, 12:45 Local	**Registration:**	N9410Q
Aircraft:	Beech A36	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that he noticed the engine oil pressure dropped to 14 psi after he began the descent to his destination airport. He turned toward a nearby airport, but shortly thereafter the oil pressure dropped to 0 psi and the engine seized. The pilot executed a forced landing to a field and the airplane sustained substantial damage to its wings when it struck fences and livestock feeding troughs during the landing.

Postaccident examination of the airplane revealed several missing and loose bolts securing the engine valve covers. The No. 4 cylinder valve cover was completely off and its gasket was not located after the accident. The No. 6 cylinder valve cover was very loose and was only held on by 4 of the 8 bolts normally used to secure the cover. The No. 4 cylinder valve arm shaft bolt was missing. Metal shavings were observed throughout the valve assembly area as well as deposited on the cowling and airplane along with the lost engine oil.

Review of maintenance records did not reveal any recorded maintenance to the rocker covers since the most recent engine overhaul 6 years before the accident. Maintenance entries since the overhaul indicated routine maintenance, including annual/100-hour inspections and oil changes, with no leaks detected during post-maintenance engine runs. Attempts to discover when the rocker covers were last accessed for maintenance were unsuccessful.

Based on the available evidence the loss of engine power was due to oil exhaustion that resulted from improper installation of the engine valve covers. Determination of when the improper maintenance was performed could not be determined based on the maintenance entries that were available.

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 due to oil exhaustion which resulted from improper engine maintenance.

Findings

Aircraft	Oil - Fluid level
Personnel issues	Installation - Maintenance personnel

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)

On March 12, 2022, about 1245 central standard time, a Beech A36, N9410Q, was substantially damaged when it was involved in an accident near Heavener, Oklahoma. The 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 the flight was from the Bentonville Municipal Airport/Louise M Thaden Field (VBT), Bentonville, Arkansas, to the Mena Intermountain Municipal Airport (MEZ), Mena, Arkansas. After beginning his descent into to the destination airport, he noticed a dramatic drop in oil pressure to 14 psi. He began to search for alternate airports since his destination was not reachable and the terrain was mountainous. He turned the airplane toward the west to attempt to reach the Robert S. Kerr Airport (KRKR), Poteau, Oklahoma, but within 1-2 minutes the oil pressure dropped to zero and the engine seized. The pilot executed a forced landing to a field. During the landing, the airplane struck fences and livestock feeding troughs, which resulted in substantial damage to the wings.

Postaccident examination revealed that the engine No. 4 cylinder rocker cover was completely off, and the No. 6 cylinder rocker cover was only being held on by 4 bolts, all of which were very loose. The No. 4 cylinder rocker cover gasket was not located after the accident. The No. 4 cylinder rocker arm shaft bolt was missing. Multiple rocker cover bolt holes were elongated and embossed with the bolt thread pattern. Metal shavings were observed throughout the valve assembly area as well as deposited on the cowling and airplane along with the lost engine oil.

Review of maintenance records revealed that the most recent maintenance on the engine was an oil change performed on December 22, 2021. The entry for the oil change noted that a post-maintenance engine run did not reveal any leaks and included no mention of work performed on the rocker covers.

On November 17, 2021, an annual/100-hour inspection was performed on the engine. The entry for the inspection noted that a post-maintenance engine run was normal. A specific notation regarding leaks was not included in the endorsement. No mention of work performed on the rocker covers was noted.

Further examination of the engine maintenance records showed that the engine had undergone an overhaul and was reinstalled on the airplane on November 2, 2016. Subsequent

to the overhaul, several maintenance entries were made; however, none of the entries since the overhaul noted any work performed on the rocker covers of the engine.

Interviews of personnel at the maintenance facility that performed the most recent overhaul revealed that approved hardware and gaskets were used to secure the rocker covers at the time of the overhaul. An interview of the mechanic that performed the most recent oil change revealed that he had not accessed the rocker covers and had no reason to while performing the oil change. Further attempts to discover when the rocker covers were last removed were unsuccessful.

Pilot Information

Certificate:	Private	**Age:**	54,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	May 2, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 20, 2022
Flight Time:	1367 hours (Total, all aircraft), 1020 hours (Total, this make and model), 1296 hours (Pilot In Command, all aircraft), 57 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N9410Q
Model/Series:	A36	**Aircraft Category:**	Airplane
Year of Manufacture:	1971	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	E-286
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	November 17, 2021 Annual	**Certified Max Gross Wt.:**	3599 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	8168 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-BB
Registered Owner:	HOOK EM LLC	**Rated Power:**	300 Horsepower
Operator:	HOOK EM LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KRKR,451 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	12:35 Local	**Direction from Accident Site:**	314°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.46 inches Hg	**Temperature/Dew Point:**	4°C / -6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bentonville, AR (VBT)	**Type of Flight Plan Filed:**	VFR
Destination:	Mena, AR (MEZ)	**Type of Clearance:**	VFR
Departure Time:	12:15 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:		**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	34.88,-94.44

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Adam Brandt; FAA; Oklahoma City, OK
Original Publish Date:	July 26, 2023
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=104768