



ERA16LA217

Westerly, Rhode Island

June 18, 2016

Beechcraft P35 – N112MB

NTSB ENGINE EXAMINATION REPORT

February 6-7, 2017

PARTICIPANTS IN THE EXAMINATION

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HISTORY OF FLIGHT

On June 18, 2016, about 1235 eastern daylight time, a Beech P35, N112MB, performed a forced landing to the ocean after a total loss of engine power near Westerly, Rhode Island. The private pilot received minor injuries. Visual meteorological conditions prevailed and no flight plan was filed for the personal flight. The airplane was owned and operated by the pilot/owner and the flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. The flight originated from Francis S. Gabreski Airport (FOK), Westhampton Beach, New York, at 1230, with the intended destination of Taunton Municipal Airport (TAN), Taunton, Massachusetts.

ENGINE INFORMATION

Engine Manufacturer: Continental Motors

Engine Model Number: IO-470-N23B

Engine Serial Number: 1005467

Recent Inspection: December 29, 2015 – annual inspection

Rebuilt: November 9, 2011

Recent Recorded TSMOH: 109 as of accident date.

Most recent oil change: approximately 10 hours prior to the accident.

12-29-15	TIME	MIN	HOURS	MIN	Installation and compliance with inspections, Airworthiness Directives, Special Inspections, Modifications and Service Bulletins
Carried forward					
Routine Annual Inspection Accomplished					
Comprehensive Checks: 1) 72/80, 2) 73/80, 3) 75/80, 4) 70/80, 5) 79/80, 6) 74/80					
Oil and Filter Changed					
Spark Plugs: Cleaned, Gapped and Ret-tied					
Exhaustors air filter replaced					
Recommending Engine A.D.'s One A.D. Follows: None					
The Following Construction Actions Were Taken:					
The flange - Remove right side exhaust system					
Welded new pipe flange. Installed exhaust system with new gaskets.					
Fuel pump drain left AFT engine Adish clamp supporting aluminum line too deteriorated rubber sleeve. Installed new Adish clamp.					
Fuel control drain right front engine below tube is missing rubber sleeve. Installed new Adish clamp.					
Air/Oil separator rubber oil line is leaking. Replaced hose with new.					
Air filter air box front seal falling off - Checked seal in place.					
Left exhaust shroud air duct had holes from age. Replaced duct with bushcraft new, per FAA form 8130-3.					
EGT probe thread clamp is loose - Tightened as needed.					
Fuel flow divider at line needs to be secured - Accomplished.					
TANK: 5186					
TACH: 2812					
ENG: 95					
PROP MOD: 173					
A & P AIRCRAFT MAINT, LLC MACARTHUR AIRPORT RONKONKOMA, N.Y. 11779 631-588-7771					
I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND DETERMINED TO BE IN AN AIRWORTHY CONDITION.					

Picture 1. Most Recent Inspection

INITIAL EXAMINATION AS RECEIVED

The engine was received crated and sealed. After removal of the crate, the engine was examined and the following discrepancies were noted:

- There was a hole in the top of the crankcase.
- The Nos. 2, 4, and rocker box covers had a hole in them.
- The engine exhibited corrosion.
- A gasket on the oil filter adapter was protruding and torn.

The engine was mounted to a portable cart utilizing mount legs for further examination and teardown.



DETAILED EXAMINATION

Induction System

The air induction tubes remained attached to the engine. The intake manifold assembly remained intact and was bent on the left side.



Picture 2. View of Induction System

Oil Cooler

The engine oil cooler was removed from the engine and examined with no anomalies noted.



Picture 3. View of Oil Cooler

Propeller Governor

The propeller governor was removed from the engine and did not rotate. The oil screen on the governor was removed and corrosion was noted in the screen.



Picture 4. View of Propeller Governor with Oil Screen Removed.

Alternator

The alternator was removed from the engine.



Picture 5. View of Alternator

Starter

The starter was removed from the engine. The starter drive adaptor was removed and metal fragments were noted on the drive shaft.



Picture 6. View of Starter

Spark Plugs

All spark plugs were removed from the engine. The spark plugs were massive electrode type plugs. All spark plugs exhibited corrosion, consistent with saltwater emersion.



Picture 7. All Top and Bottom Spark Plugs

Magnetos

The magnetos remained attached to the engine and were removed. They did not rotate by hand. They were disassembled and corrosion was noted inside both magnetos, which was consistent with salt water emersion.



Picture 8. View of both disassembled magnetos

Oil Sump

The engine oil sump was removed from the engine. Sections of the No. 4 connecting rod were located in the oil sump along with bearing material. In addition, an unmeasured amount of oil and metal particles were noted inside the oil sump.



Picture 9. View of Oil Sump and Metallic Particles

Oil Suction Screen

The oil suction screen was examined and debris consistent with salt water emersion was noted.



Picture 10. View of oil suction screen.

Oil Filter

The oil filter remained attached to the engine through an oil filter adapter. When the oil filter was removed, the break away torque was 163 in lbs. The loosening torque was less than 160 in lbs. The torque wrench would not measure anything below 160 in lbs. Furthermore, the fiber gasket was torn and partially extruded from the adapter. The oil filter adapter was removed and the fiber gasket was removed. The fiber gasket was torn in one location and the crush deformation not symmetrical around the gasket. The oil filter was disassembled and metal particles were noted in the filter. The maintenance log indicated that the most recent oil change occurred about 10 hours prior to the accident.



Picture 11. Oil filter installed on oil filter adaptor.



Picture 12. View of Torn Gasket as found on engine.



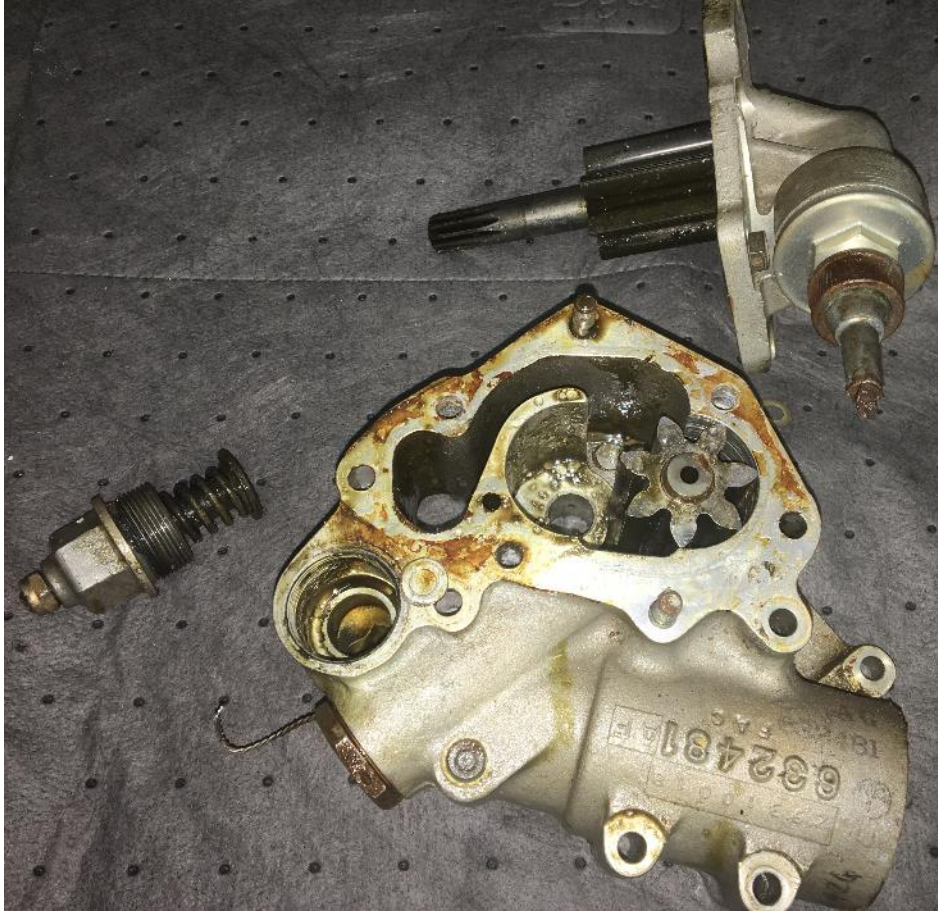
Picture 13. View of Gasket on Adaptor.



Picture 14. View of oil filter with metallic particles.

Oil Pump

The oil pump was removed from the engine and it was disassembled. The pump rotated when turned by hand. The pump body had scoring consistent with hard particle passage through the pump.



Picture 15. View of oil pump with interior scoring.

Throttle and Metering Assembly

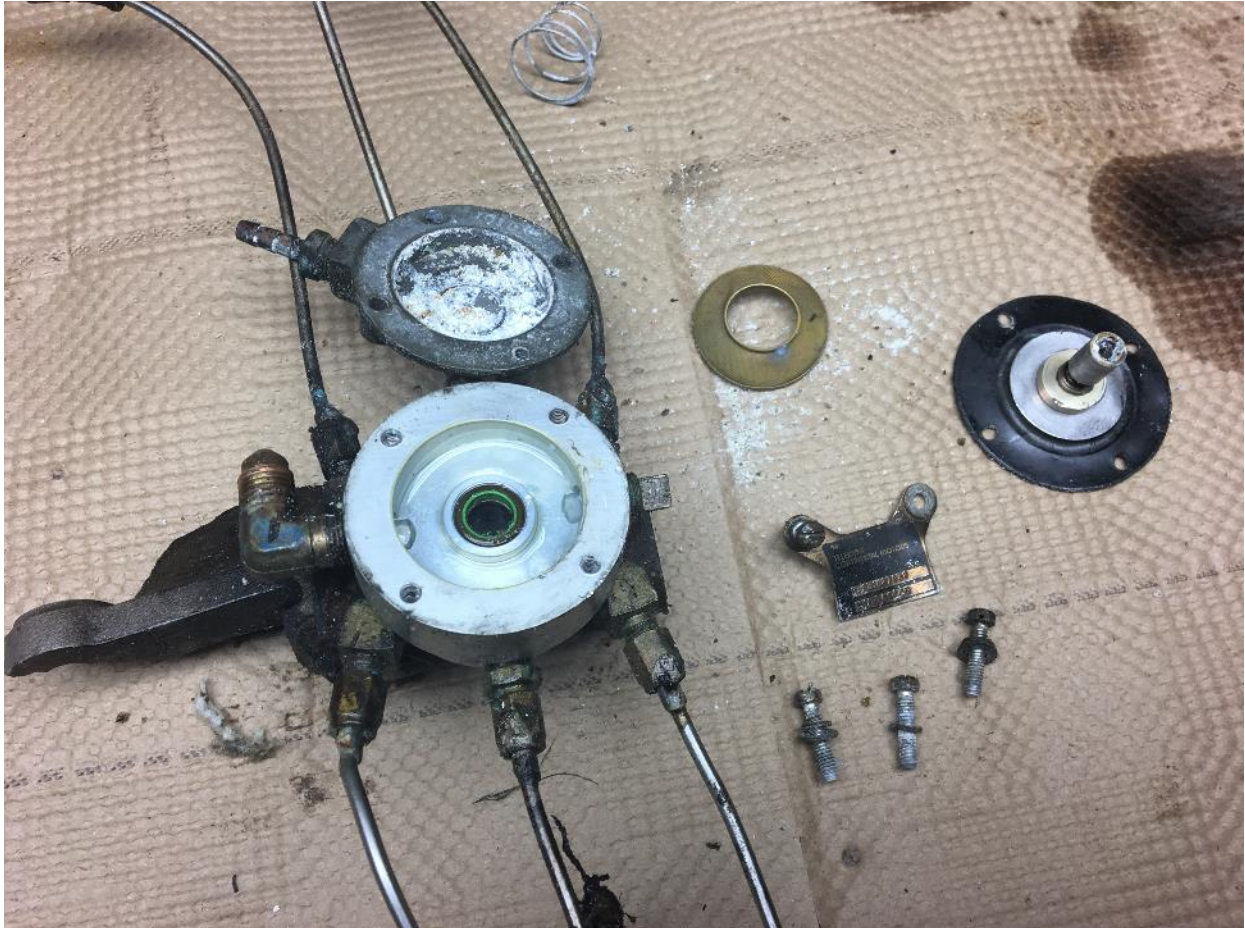
The throttle and metering assembly was removed from the engine. The fuel screen was removed and no debris was noted.



Picture 16. View of Throttle and Metering Assembly

Fuel Manifold Valve

The fuel manifold valve was removed from the engine. It was disassembled and fuel was noted in the manifold and corrosion was noted, which was consistent with salt water emersion. In addition, the screen was free of debris.



Cylinders

The rocker box covers were removed to examine the valve train system. Cylinders remained attached to the engine and were removed to facilitate examination. The cylinders and valves remained intact. The No.4 piston exhibited impact damage.





The Nos. 1, 2, and 4 pistons were lodged in the cylinders and unable to be removed.

Connecting Rods

The connecting rods were removed from the crankshaft and examined with no anomalies noted on the Nos. 1, 3, 5, and 6. The Nos. 2 and 4 connecting rods were fractured from the crankshaft. The Nos. 1 and 2 connecting rods remained attached to the pistons. Parts of the No. 4 connecting rod were located throughout the engine, however not all parts were located.



Picture 17. View of Connecting Rods

Camshaft

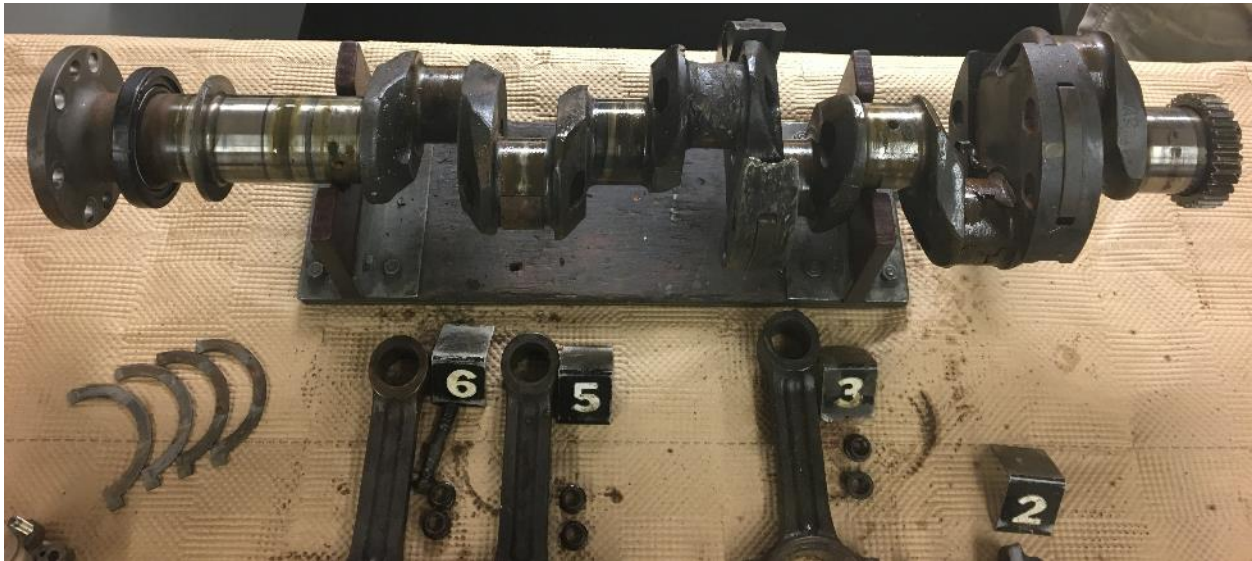
The camshaft remained intact and was removed from the engine. No anomalies were noted on the camshaft.



Picture 18. View of Camshaft.

Crankshaft

The propeller mounting flange remained intact and the mounting holes were not elongated (propeller had remained attached but removed for engine shipment). The four counterweights remained attached to the crankshaft and moved freely by hand. All of the connecting rod journals exhibited thermal damage and lubrication distress.



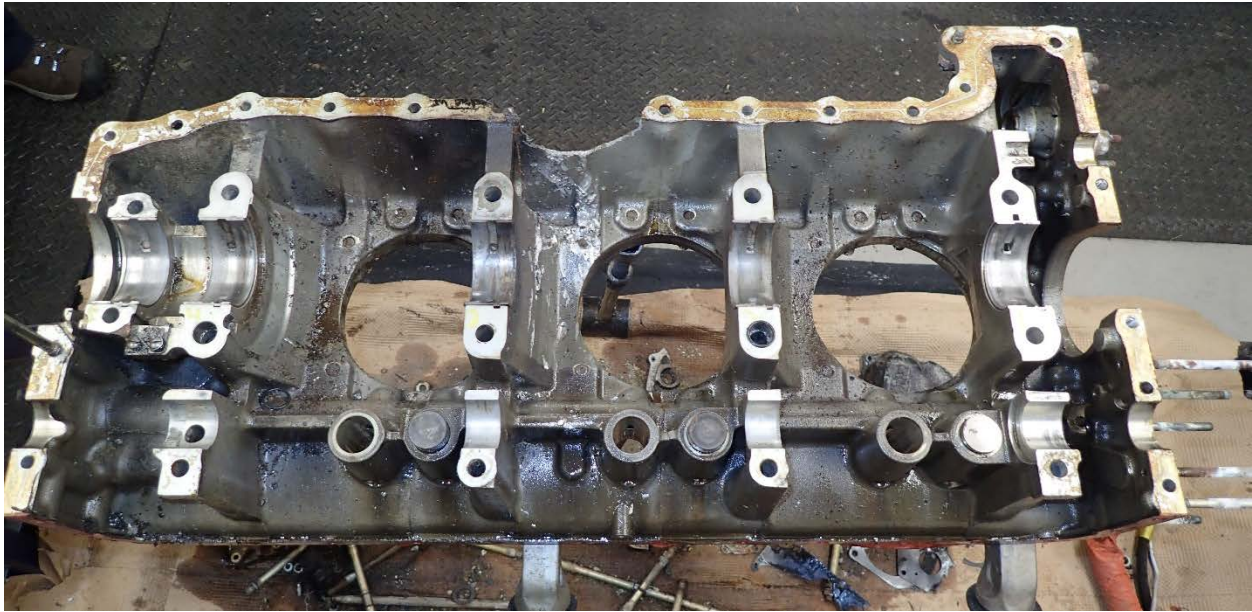
Picture 19. View of Crankshaft.

Case Halves

The engine case halves were separated to examine the internal components. The oil passages were free of debris. The No. 3 main bearing exhibited lubrication distress, but there was no bearing shift or bearing fretting noted on any of the bearings. Damage was noted on the inside of the case near the Nos. 3 and 4 cylinders.



Picture 20. Nos. 2, 4, 6 Side of Crankcase



Picture 21. Nos. 1, 3, 5 Side of Crankcase.

SUMMARY

The examination revealed that the oil gasket was torn and extruded from the oil filter adaptor.

[REDACTED]

FUTURE ACTIVITIES

The engine will be returned to storage at Anglin Air Recovery in Clayton, Delaware, and kept with the accident airplane in preparation for the release of the wreckage by the National Transportation Safety Board IIC.