



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

July 16, 2019

Engine Exam Summary

WPR19FA178

This document contains 5 embedded photos.

ACCIDENT:

Location: Sunriver, OR

Date: 6/22/2019

Aircraft: Maule M-7-235B, Registration Number: N118G

NTSB IIC: Jack Vanover

EXAMINATION PARTICIPANTS:

Jackie Vanover

Aviation Accident Investigator

National Transportation Safety Board

Federal Way, WA 98003

Eric Gutierrez

Aviation Accident Investigator

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Federal Way, WA 98003

Troy Helgeson

Air Safety Investigator

Lycoming Engines

Williamsport, PA

Tony Moore

Aviation Safety Inspector-PMI

Federal Aviation Administration

Portland, OR

HISTORY OF FLIGHT

On June 22, 2019, about 1040 Pacific daylight time, a Maule M-7-235B, N118G, nosed over during a forced water landing on Deschutes River, Sunriver, Oregon. The pilot was fatally injured and the passenger sustained minor injuries. The airplane was registered to K2 Enterprises LLC. and operated by the pilot as a Title 14 *Code of Federal Regulations* part 91 personal flight. Visual meteorological conditions prevailed at the accident site about the time of the accident and no flight plan was filed for the local flight. The flight originated from the Sunriver Airport (S21) Sunriver, Oregon about 1039.

According to the pilot rated passenger, the purpose of the flight was to see how the airplane performed with two persons onboard. The pilot taxied to runway 18, a 5,461 ft long and 75 ft wide asphalt runway, performed an engine run-up with no anomalies noted, and began his takeoff roll. The passenger stated that the throttle was full forward and the engine did not sound abnormal.

The passenger further reported that the pilot rotated about 65 knots with about 1,000 ft of runway remaining, and the airplane lifted off the runway, into ground effect. He recalled that once the airplane came out of ground effect, the rate of climb was slow, and it was apparent that they would not clear the 50 ft trees across the river. The pilot maneuvered the airplane to the left. At some point, the pilot stated, "oh this looks bad". The passenger recalled that he was unaware that the river was the intended forced landing site until seconds prior to touchdown. During the landing touchdown onto the river, the airplane nosed over, turned 180° and floated downstream

about 300 ft.

Multiple witnesses reported that the airplane appeared to have difficulty gaining altitude during takeoff.

The airplane was recovered to a secure facility for further investigation.

PERSONNEL INFORMATION

According to FAA and pilot records, the pilot held an airline transport pilot certificate with ratings for airplane multi-engine-land. He also held a commercial pilot certificate with ratings for airplane single-engine-land, single-engine-sea, instrument airplane, helicopter, and glider. He also held a flight instructor certificate with ratings in airplane-multi, helicopter, glider, and instrument. The pilot had accrued approximately 7,080 total hours of flight experience. His most recent application for a FAA third-class medical certificate was on March 7, 2019.

WRECKAGE AND IMPACT INFORMATION

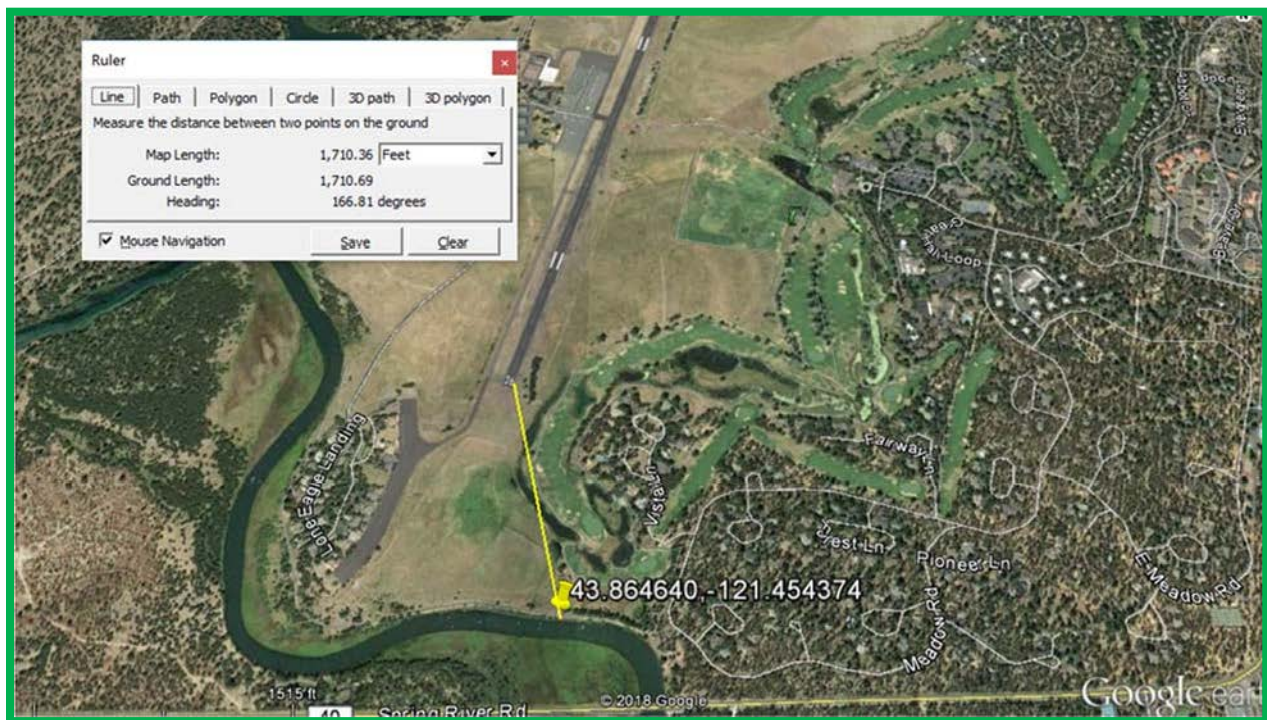


Figure 1: View of accident site relative to the departure airport.

AIRCRAFT INFORMATION

The four-seat, high-wing, fixed-gear airplane, N118G, serial number 23025C, was manufactured in 1996. It was powered by a Lycoming IO-540-W1A5 235-hp engine, serial number L-25660-48A. A review of the airplane's logbooks showed an annual inspection had been completed

December 17, 2018, at a recorded tachometer reading and airframe total time of 953.7 hours. The last maintenance performed was dated June 4, 2019, at a tachometer time of 967.7 hours.

Review of the airplane logbook revealed that the exhaust system was sent out for repairs during an annual inspection on June 22, 2011 at an airframe total time of 794.7 hours.

ENGINE EXAM

The engine exam took place on July 16, 2019, at the facilities of NU Venture Air Services LLC., Dallas, OR.

SUMMARY OF FINDINGS

The examination revealed that the muffler baffling was separated inside of both mufflers. On the right muffler, the baffle was obstructing the exhaust out hole.

PRIOR TO ENGINE RUN

The primary ignition leads were removed from the top and bottom spark plugs. The top spark plugs were removed. The engine cylinders were borescoped and no anomalies were noted. 2½ gallons of water were drained from the oil sump. About 7 gallons of oil remained. Both magnetos were checked for timing. The timing was about 24° and was within about 1° of each other. The right magneto was removed, the vent was opened to allow the water to drain. Compressed air and contact cleaner were used on the magneto to dry it out and then it was reinstalled. The drain valve on the left magneto was removed and contact cleaner and compressed air was used to dry it out. A five-gallon fuel can was strapped to the top of the fuselage and a fuel line was plumbed from the fuel can into the left fuel line. The fuel selector was set to the left tank.

FIRST ATTEMPT TO RUN ENGINE

The first attempt to run the engine was unsuccessful. The engine turned over and started but would not maintain power. The engine was shut down and further examined.

EXAMINATION OF THE MUFFLER

Examination of the muffler revealed that the baffling was separated inside of the muffler. On the right muffler, the baffle was turned 180° and was obstructing the exhaust out hole. The left

muffler baffle was separated and moved freely inside of the muffler. The left and right muffler were removed, and the engine was run.

SECOND ENGINE RUN

The engine was started, and the throttle was advanced to about 1,500 rpm. A magneto drop was conducted. About 100 rpm drop was noticed on both the right and left magneto. It was then run up to 2,400 rpm with no anomalies noted.

The left and right muffler were retained for further investigation. During a further examination of the mufflers, the following was revealed.

Right Muffler

About 1 ½ tablespoons of debris was removed from the muffler. Of which, about ½ tablespoon was comprised of ferromagnetic debris. The muffler was borescoped and machining was noted on most surfaces on the inside of the muffler. About 5 holes (about 2.5 inches) were visible from one side to the other and the baffling was turned 180°.

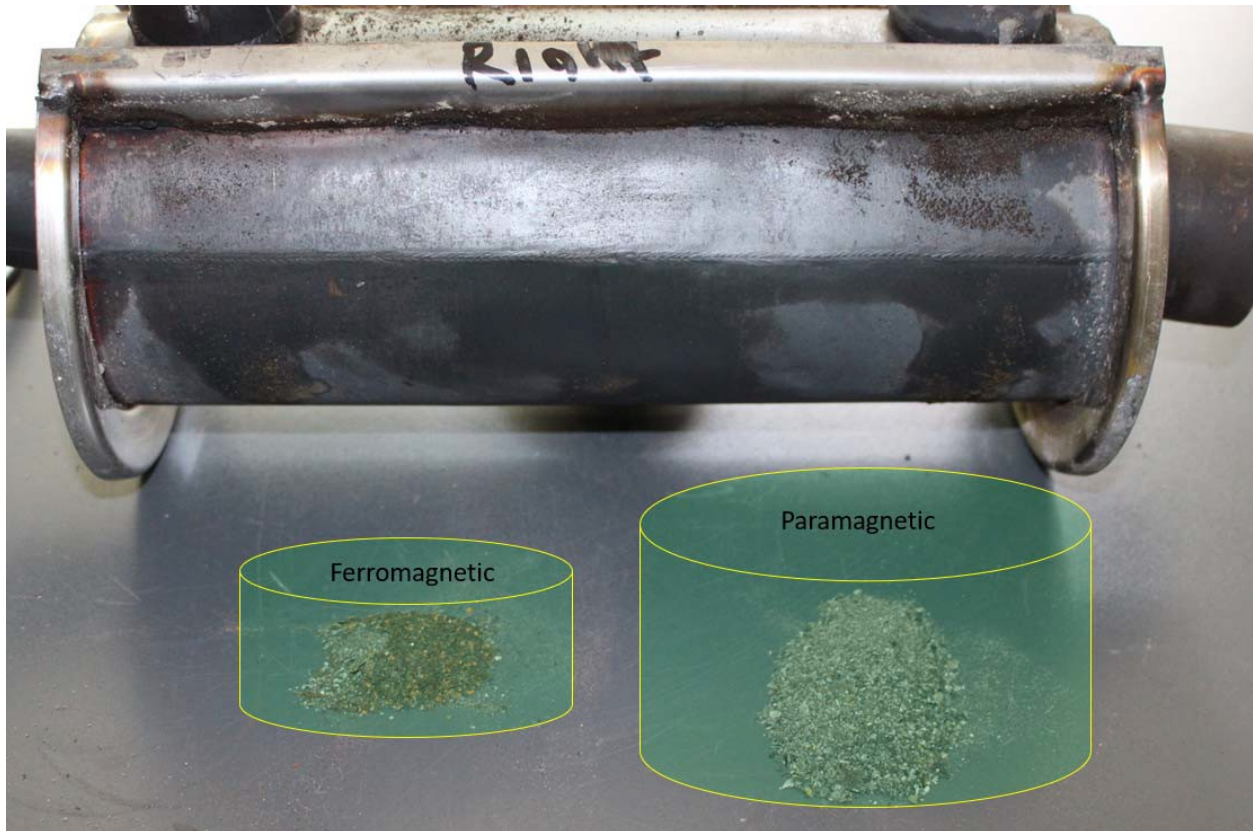


Figure 2: View of debris from right muffler.

Left Muffler

Examination of the left muffler revealed that the baffling was broken. About 11 holes (about 5 inches) were visible from one side to the other. Some machining was noted to part of the inner surface.

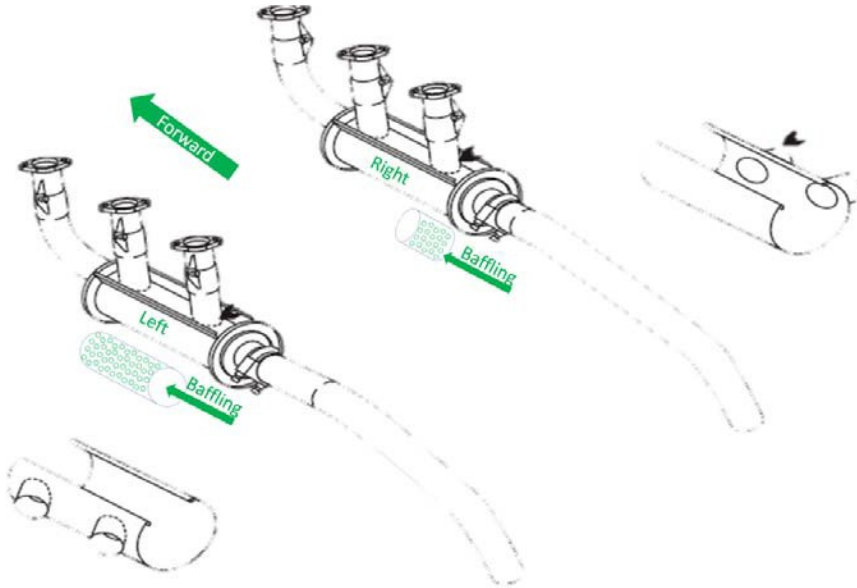


Figure 3: View of exhaust system.

The outflow reduction was calculated based on the area of the small and large holes. Only 5 small holes would have been available for the exhaust gases to escape, which calculates to about an 89% reduction on the right muffler.

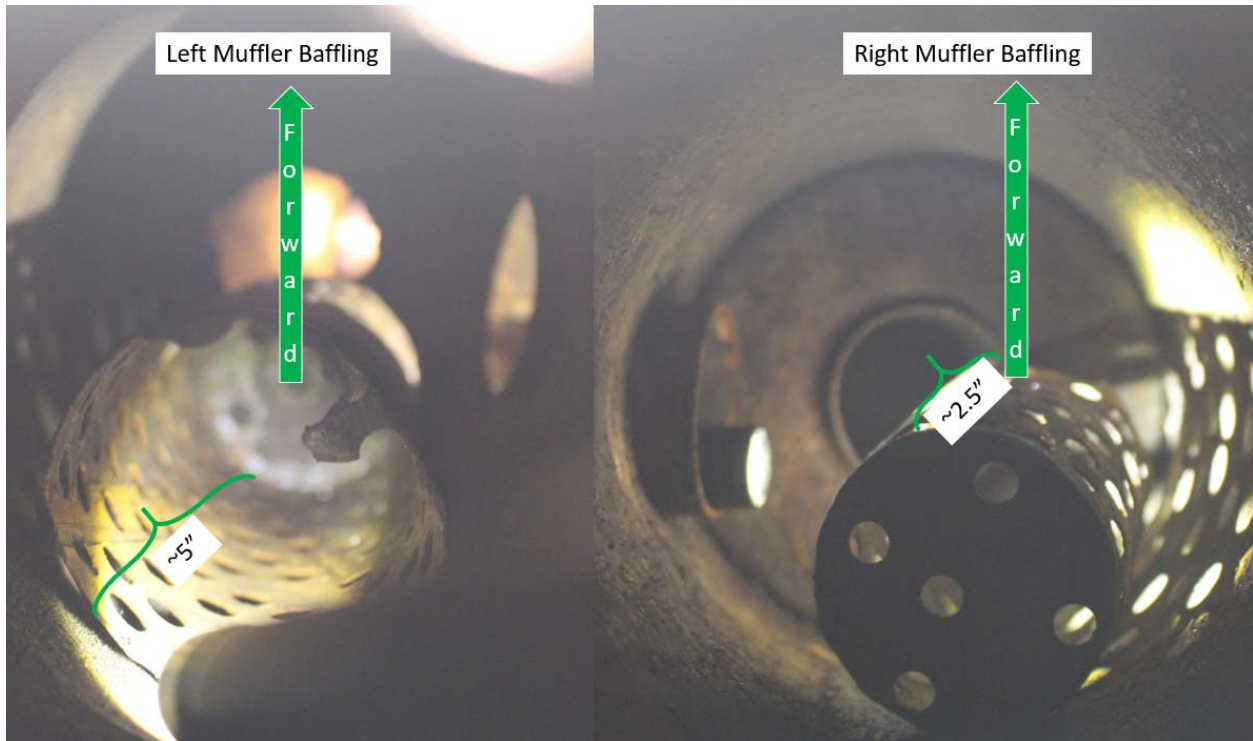


Figure 4: View of right and left muffler baffling.

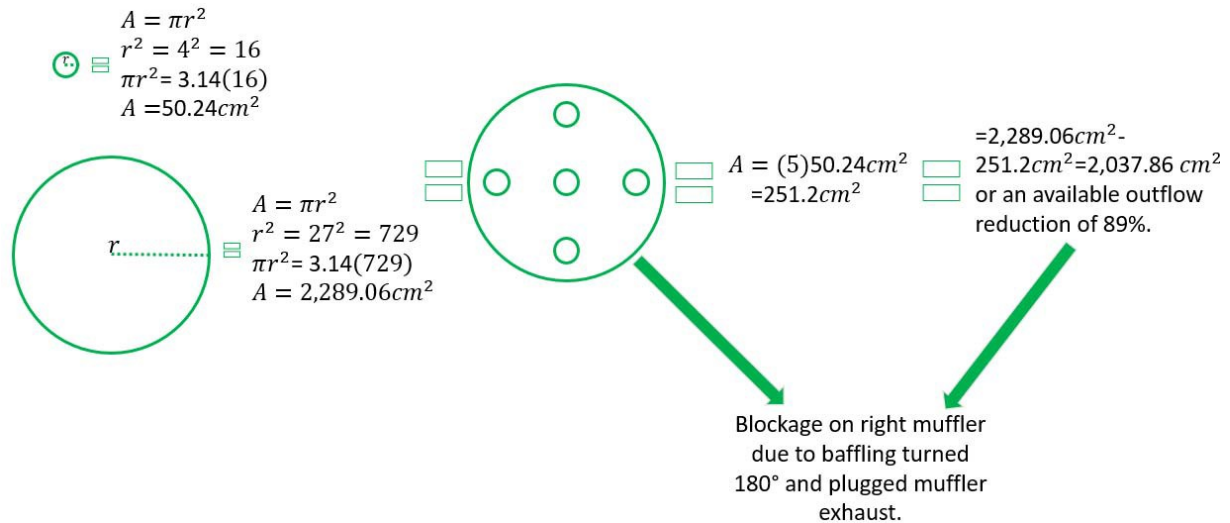


Figure 5: Calculation of outflow reduction.

ADDITIONAL INFORMATION

Per the maintenance manual TLC-M-7-235A/B, rev. C Dated 4-13-16. There is no requirement to check inside the muffler to ensure that the baffling is not fractured or unserviceable.

EXHAUST SYSTEM:

Remove Heater Shells, check mufflers and tailpipes for cracks. Check attachments for security. Note that the tailpipe clamps and the muffler-to header attachments should not be tightened to the point of rigidity, but should be loose enough to be moved easily by hand.

Check the heater shell retaining screws for security and ensure that hot air hoses are clamped tightly and are not worn or chafed.