

Inspector Statement
N118G Accident Follow Up Investigation

Name: Anthony Moore, ASI
At Nu Venture Service, Dallas, OR
Date: 7/16/2019, at 2:18 PM

On July 16, 2019, at about 09:20 AM I met with NTSB investigators and a Lycoming technical representative at the storage yard of Nu Venture Services, 2553 Kings Valley Hwy, Dallas, OR. The remaining wreckage from N118G, a Maule M-7-235B airplane was stored there for NTSB follow up and tear down investigation. Engine installed was Lycoming IO-540 SN L-25660-431 (data plate not clear).

Lead NTSB IIC Jack Vanover, NTSB investigator Eric Gutierrez, Lycoming technical representative Troy Helgelson, and Nu Venture employees Mike Dowd and John Esch were all present for the engine tear down investigation.

When I arrived the wings had been set aside, and fuel in a 55-gallon drum had been tested for water. About 33 gallons was removed from the wings at the accident site and was stored in a barrel for transport. About 5 gallons of this fuel was placed in a plastic fuel tank for test running the engine. The tank mounted to the top of the cabin fuselage was connected to the existing left wing fuel line and the other line was crimped closed. The left wing tank was selected, and fuel was observed from the boost pump drain sump fitting when opened.

A spare 12-volt battery was installed in the rear fuselage, and power was turned on. The fuel boost pump did not operate, even after taping by John. The avionics were switched off on the avionics master switch.

The air filter was removed from the engine, and all spark plugs were removed and cleaned with electrical solvent. The engine oil sump drain was opened and about 2 ½ gallons of water were drained into a bucket before oil started dripping. About 6-7 quarts oil remained after draining. The left magneto was cleaned through the vent hole with WD-40, and blown out with compressed air. The right magneto was removed and cleaned with WD-40 and compressed air through the vent hole. Verified spark presence in both mags at ignition lead. LH mag had impulse coupling and fired on all six cylinders by turning engine. RH mag spun with drill gun and verified spark at all six holes. Reinstalled and timed RH magneto to match LH mag at 24 degrees advance.

The propeller spinner was removed as it was damaged and out of track.

After turning over engine several times fuel was observed at intake drain line, but no start possible. I suggested removal of both exhaust pipes from the right and left muffler as the right exhaust pipe was crushed and full of dirt and debris.

After removing both exhaust pipe clamps at the back of both mufflers, John noticed a blockage in the left muffler when the tail pipes were removed from the mufflers. Eric also noticed a blockage in the RH muffler outlet. On closer inspection, we found that the internal muffler baffle cones had broken off at the weld point on both muffler outlets.

The LH muffler had the aft end of the internal baffle cone resting against the opening, and could be moved around with a finger. The RH muffler outlet appeared to be plugged, as the forward end of the baffle cone had reversed position and was stuck in the outlet hole of the RH muffler. Eric reported pushing on it gently and then it dropped into the muffler. Photographs were taken by FAA and NTSB of the mufflers, both internally and externally.

Photographs clearly show that the LH baffle tube broke off at the joint between the muffler outlet tube and muffler body, and jagged edges were found at the separation point. The entire baffle cone was visible in the correct position (forward and aft wise) inside the LH muffler, and appeared to be full size.

The RH baffle tube had reversed ends, and the forward end was clearly visible with five small holes in a flat end plate. These five small holes appeared to be all that allowed exhaust gasses from the RH cylinder bank to exit the muffler, and most likely significantly reduced available engine HP.

After removal of the muffler assemblies from the engine, another test run was attempted. The engine started quickly, and Troy was in the cockpit running the controls. Jack sat next to him observing gauges. A magneto check was performed about 1500 RPM, and Troy said about 100 RPM was dropped when switching from LH / RH / Both magneto positions on the ignition switch. The mag drop was even on both mags, and power was advanced to about 2500 RPM according to Jack. The engine sounded normal and did not sputter at full power. The power was reduced slowly to idle and appeared to run in an acceptable manner.

Follow up discussion between NTSB and myself confirmed we all believed the blockage in the mufflers was a significant factor affecting engine performance. We discussed that part 43 appendix D does not require internal inspection of mufflers at 100 hour and annual inspections, and that these damaged baffle tubes could have been that way for some time.

We also observed the ignition switch as set to LH magneto only at recovery, and I said that both magnetos were needed at heavy loads and high elevation to produce full power for takeoff.

Both magnetos appeared to run properly, and it could be that the pilot left the switch in the left position instead of both position on takeoff. However, this could not be confirmed or eliminated as a possible factor affecting take off performance.

At about 2:30 PM we concluded the investigation and I returned to the office. Radios and electronic sensor equipment previously removed by ASI Bradshaw at the accident scene was returned to NTSB custody in sealed containers filled with river water, as requested by NTSB.

Anthony Moore, ASI PMI