



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

January 12, 2017

ENGINE EXAMINATION

CEN17LA068

A. ACCIDENT EXAM

Location: Air Salvage of Dallas (ASOD)
Date: January 12, 2017
Aircraft: Mooney M20K: N1159G,
NTSB IIC: Jason Aguilera

B. EXAMINATION PARTICIPANTS:

Craig Hatch	John Kent
Air Safety Investigator	Continental Motors
National Transportation Safety Board	Mobile, AL
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C. SUMMARY

Examination of the recovered airframe and engine was conducted on January 12, 2017 at the facilities of ASOD. The airframe was resting on its belly, and strapped down to a flatbed trailer. The wings had been removed (cut off for recovery) from the fuselage. Additionally, the horizontal and vertical stabilizers and related control surfaces had been removed.

In order to conduct an engine run, the airplane's damaged three-bladed propeller and the #4 cylinder rocker cover were replaced. The ignition lead to #4 bottom cylinder and the aftermarket, "merlin" waste gate controller were repaired. The fuel line from the wing root to the engine compartment, were checked for integrity by adding shop air to the system; no leaks or blockage were noted.

The oil filter had 12/19/16 on it, at a hobbs time of 2,361.0

Fuel from portable gas cans were connected to the left and right side fuel lines, located in the wing fuel tanks. The fuel return line was disconnected on the engine side of the firewall, and directed into an additional fuel can.

D. DETAILS OF THE INVESTIGATION

1.1 Exam Photos



Engine with #4 cylinder, ignition lead repaired and rocker cover replaced.

Damage to oil cooler is noted



Waste gate controller, repaired and attached (safety wired) to the engine/mount.



Wing fuel tank, and fuel pickup point.



Fuel cans connect to fuel pickup points;
Airplane on trailer ready for engine run.



Hobbs meter: 2362.1



Engine run, during testing

Several test runs were conducted:

Run #1- The engine was started and allowed to warm up (~6 minutes). With the engine running (with power) the fuel selector was switched from the right fuel tank, to the left tank. After a brief moment the engine started to lose power, the fuel selector was quickly switched back to the right side. The engine shuddered a couple times, but continued to run and resumed power.

Run #2 – The fuel lines were disconnected and shop air introduced to the fuel lines on both left and right sides, in order to drain the fuel lines completely. The fuel lines were then reconnected to the fuel respective fuel cans. With the right side tank selected, the engine boost/prime pump was able to deliver fuel to the engine. The engine was then started and run to power. The fuel selector was then moved to the left tank position. Again after a brief moment, the engine started to lose power; no operator/pilot action was conducted, and the engine continued to lose power until it stopped.

Run #3 - Without disconnecting the fuel lines, another run was conducted. Again the engine was started on the right side fuel tank. After the engine was brought to power, the fuel selector was switched to the left tank. Observation from outside the airframe, did not detect any noticeable differences. However, the operator inside the airframe, noted a drop in fuel pressure, and a slight decrease in engine manifold pressure, before recovering. It was presumed that the previous engine run and purged most of the air left side fuel line.

Run #4 and #5 – For the last two runs, the same procedure was conducted. Before the engine test started, the fuel lines were disconnected, and shop air was used to drain the fuel lines. The fuel lines were reconnected, the engine was primed by the boost/prime pump. With the right side fuel tank selected the engine was started and run to power. The fuel selector was then switched to the left side. After a brief moment, the engine would lose power, and without operator intervention, the engine would come to a complete stop.