

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ANC25LA005

ENGINE EXAM

December 12, 2024

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A. ACCIDENT

Location: Lanai, Hawaii
Date: October 24, 2024
Time: 15:35 Hawaii-Aleutian Standard Time
3:25 ZULU
Airplane: Cessna 150

B. ENGINE EXAM

IIC	Stacia Joyce NTSB Anchorage, Alaska
FAA IIC	Andrew Rasmussen Federal Aviation Administration Honolulu, Hawaii
Subject Matter Expert	Marty Johnston Party Member/A&P Mechanic Lanai, Hawaii
FAA	Howard Stevens Federal Aviation Administration Greensboro, North Carolina

C. SUMMARY

On October 24, 2024, about 1535 Hawaii-Aleutian Standard time, a Cessna 150 airplane, N10495 sustained substantial damage when it was involved in an accident near Lanai, Hawaii. The pilot and passenger onboard were uninjured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 flight.

The pilot reported that after departing the airfield to the north, the engine began to lose power. The engine was running but not producing enough power to make it back to the airport. The pilot made an emergency landing to a dirt road about three miles north of the Lanai airfield. The airplane sustained substantial damage to the left wing.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

The right wing sustained substantial damage during the forced landing event (Figure 1). No other damage to the fuselage or wings was observed.



Figure 1Damage to right wing

2.0 Engine Examination

The Continental O-200A engine SN 199608-9A was installed on the airplane on May 28, 2020 (Figure 2). The engine was rebuilt by Signature Engines in February of 2020, the total time since new was 5376.9 hours. At the time of the accident the engine had about 566 hours since overhaul. The last annual inspection was completed on July 12, 2024.



Figure 2 Left side view of airplane engine

Fuel was drained from the carburetor bowl, no particulates or water was observed. The fuel looked and smelled like fresh automotive gasoline. This was consistent with the condition of both the firewall mounted fuel strainer and the carburetor inlet screen.

Overall engine condition was found to be good, no holes or leaks. All fuel and oil lines were secure. Continuity was established between the throttle, mixture and carburetor heat controls in the cockpit and the engine. The engine oil was verified to be at 5 quarts which is normal for this airplane.

The ignition harness was secure and found to be in good condition. The top and bottom spark plug leads were disconnected and the spark plug electrodes were inspected and found to have normal wear. The No. 4 cylinder spark plugs were observed to be white in color while the spark plugs from the other cylinders were observed have a smoky dark gray appearance. Ignition was verified on all spark plugs.

Thumb compressions were observed on all cylinders. The cylinders were examined with a borescope and the No. 4 cylinder was observed to have longitudinal scratches from top of ring travel to the bottom of the piston's stroke. All cylinders were in serviceable condition.

The crankshaft was rotated, the impulse couplers in the magnetos functioned normally. During the rotation of the crankshaft all pistons moved freely and smoothly and the accessory gear box gears rotated smoothly. Timing of the magnetos was $\frac{1}{2}$ and 1 degree retarded, within normal limits.

The air intake filter and exhaust system were inspected, no abnormalities noted.

The Ignition switch recently changed 7.6 hours ago was found properly installed, wired and functioning.

The fuel lines into the carburetor were secure and no leaks observed. The last chance fuel screen was removed from the carburetor, a couple of very short, fine white fibers were found streaming from the screen, otherwise it was largely unobstructed. Both fuel caps were opened and observed to have positive pressure and normal unobstructed venting.



Figure 3 Carburetor last chance screen

The airplane engine was started and idled within normal limits. The RPM was increased to 1700 and the magnetos and carburetor heat was checked, both systems functioned normally. The engine ran rough at 2400 RPM and ran worse at 2000 RPM. The engine idled smooth when warm at 700 RPM.

The oil filter was removed, small flakes of metal were observed in the oil filter media.

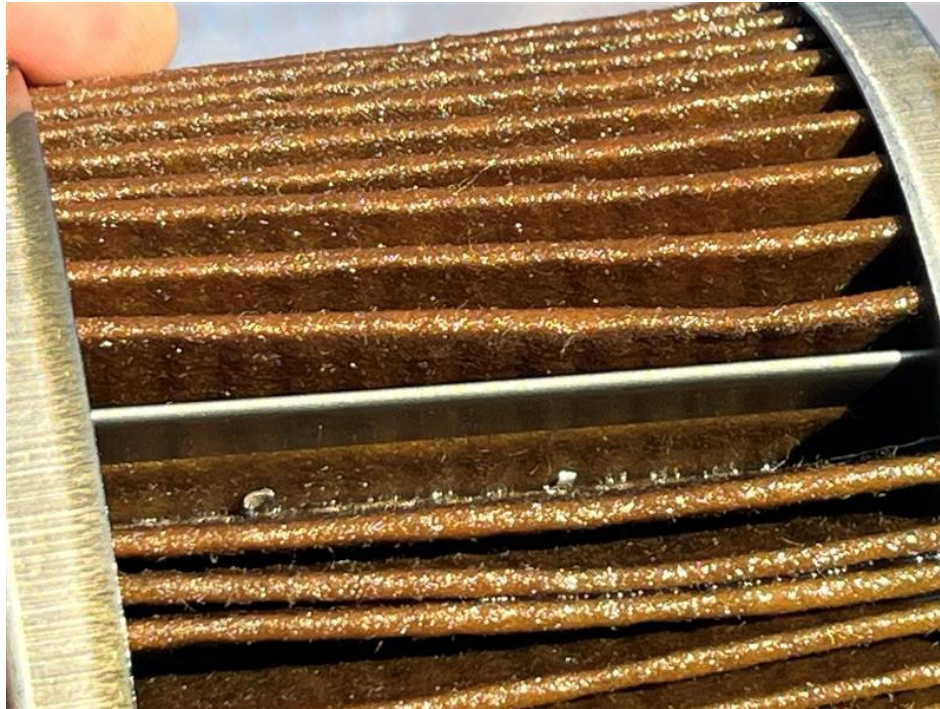


Figure 4 Engine oil filter media with metal particulates

The Marvel Schebler MA-3SPA 10-4894-1 carburetor was removed for further inspection. At the time of the accident the carburetor 708.6 hours since overhaul. The carburetor had primarily been running with unleaded Autogas which is believed to be free from ethanol.

Carburetor heat controls were found properly rigged, air box and flapper valve in good shape, the SCAT hoses that feed fresh air to the heat muff and heated air to the carburetor air box were both in good condition and properly clamped. There was no evidence of bird strike or other obstruction to the air filter or carb heat inlet.

All fasteners were found in place and properly safety wired and cotter pinned.

2.1 Carburetor Exam

On December 5, 2024 with FAA oversight the carburetor was flow tested and disassembled for inspection at the Marvel Schebler facility in North Carolina. The flow test results were normal and no anomalies were found when the carburetor was disassembled (Figures 5-9).

Report for the NTSB Performed by FAA ASI Howard Stevens from the GSO FSDO EA-39

Carburetor PN: 10-4894-1; SN: MSC60313

12/04/2024 Received carburetor from NTSB office.

12/05/2024 Traveled to CH V24R with FAA ASI Michael Aubry and Bob Cranwell.

We observed CH perform a flow check of the carburetor, the results of which are included with this report. The technician stated that it was a little rich, but nothing was noted that would cause any significant operational issues.

We observed a technician disassembly the carburetor. Some small amounts of debris were noted on internal filters, but nothing that would cause any significant operational issues. It appeared normal for a carburetor in service for this amount of time.

No other issues were noted from the teardown. All other parts were in good working order and no defects were noted.

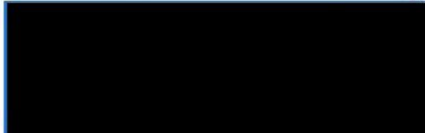
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CHARLES STEVENS
Date: 2024.12.06 10:25:59
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Figure 5 FAA report from carburetor inspection



Dec. 05, 2024

Marvel-Schebler Aircraft Carburetors LLC. has completed a fuel flow evaluation of carburetor model MA-3SPA, part number: 10-4894-1, serial number: MSC60313. This evaluation was performed on December 5, 2024. The evaluation was witnessed by Michael Aubry, Robert Cranwell and Howard Stevens of the Greensboro NC FSDO. The results are as follows.

As compared to the target flow for this model, the performance of carburetor: 10-4894-1, serial number: MSC60313, was as expected overall. This evaluation does not include the idle setting, as the final determination for this setting is done in the field.

At the first power setting the unit is nominally 8.4% more rich than the target flow, nominally 6% more rich than the flow of the target is the maximum permitted at this setting.

At the second setting the unit is nominally 1.7% more rich than the target flow, nominally 1.7% more rich than the flow of the target is the maximum permitted at this setting.

The full throttle power setting is nominally 3.4% more lean than the target flow, nominally 6.1% more lean than the flow of the target is the maximum permitted at this setting.

Carburetor serial number MSC60313 was returned to Michael Aubry, Robert Cranwell and Howard Stevens of the Greensboro NC FSDO.

Please feel free to contact me for any further assistance,

Mark Keeney
for

Marvel-Schebler Aircraft Carburetors LLC.

2208 Air Park Dr.
Burlington, North Carolina 27215
Phone: 336-446-0002 // www.msacarbs.com
Or Toll Free @ 855-MSACARB (855-672-2272)

Figure 6 Carburetor flow test results



Figure 7 Carburetor presented at inspection



Figure 8 Carburetor disassembled at inspection

Meteorological Information

Carburetor icing conditions were evaluated on the day and time of the accident, the calculated relative humidity at this temperature and dewpoint was 70 percent. Review of the icing probability chart contained in the Federal Aviation Administration Special Airworthiness Information Bulletin CE-09-35 revealed the atmospheric conditions at the time of the accident were “conducive to serious icing at glide [idle] power.” Although weather conditions reported at the time of the accident were conducive to the accumulation of carburetor icing at glide power, the pilot reported that he used carburetor heat prior to takeoff and had full power applied during the climb out.

Carburetor Icing Probability Graph – ANC25LA005

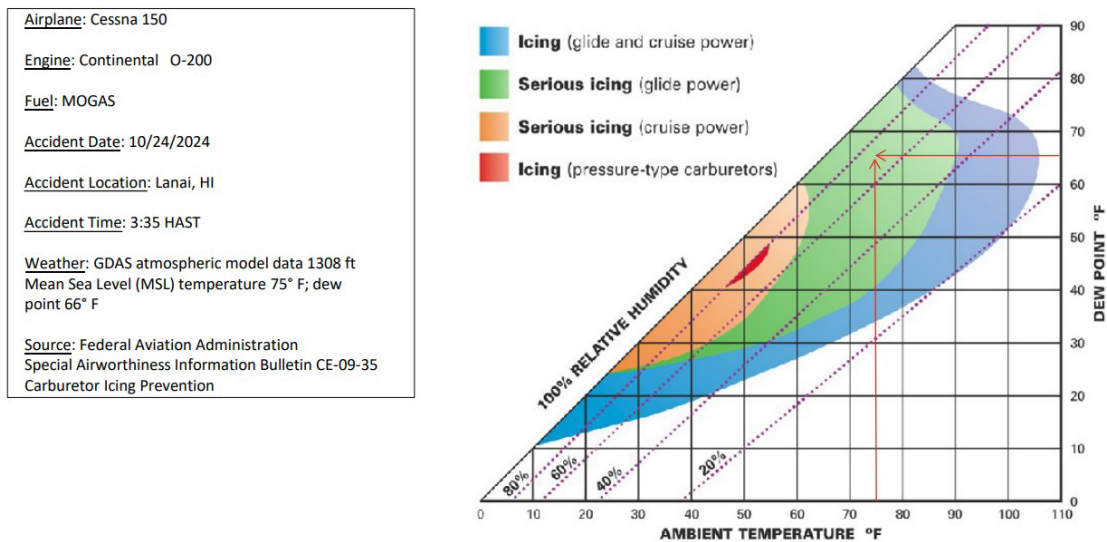


Figure 9 Carburetor icing probability graph

Submitted by:

Stacia Joyce
IIC