



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

March 5, 2020

EXAMINATION SUMMARY

ERA19LA081

A. ACCIDENT

Location: Apopka, Florida
Date: December 30, 2018
Time: 2025 EST
Airplane: Cessna LC41-550FG, N78JE

B. INVESTIGATION PARTICIPANTS

Ralph E. Hicks - IIC
Eastern Region Aviation (ERA)
National Transportation Safety Board
Marietta, Georgia 30068
[REDACTED]

Ric Riccardi
FAA Accident Coordinator (A/W)
Aviation Safety Inspector
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Kurt Gibson
Continental Motors Inc.
Mobile, AL
[REDACTED]

Andrew Hall
Textron Aviation
Wichita, KS
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C. SUMMARY

On December 30, 2018, about 2025 eastern standard time, a Cessna LC41-550FG, N78JE, was substantially damaged during a forced landing at Apopka Airport (X04), Apopka, Florida. The private pilot was not injured. The airplane was operated by Hardwood Transport LLC under the provisions of Title 14 *Code of Federal Regulations* Part 91. Night, visual meteorological conditions prevailed, and no flight plan was filed for the flight to X04. The flight departed Greater Binghamton Airport (BGM), Binghamton, New York about 1523.

1.0 Accident Site

The investigation team did not travel to the accident site. The wreckage was recovered by Florida Air Recovery.

2.0 Airframe Examination

The airframe was examined at Florida Air Recovery, Jacksonville, Florida, on February 7, 2019.

The aircraft impacted in a wooded area. The right outboard wing separated from the near Wing Station (W.S.) 145.0. The left wing was observed in multiple sections. The outboard section was from the tip to W.S. 145.0 and the next heavily fragmented section was from W.S. 145.0 to W.S. 95.0. The remainder of both wings remained attached to the fuselage. The empennage was observed separated at Fuselage Station (F.S.) 216.0. The fuselage area between F.S. 192.0 and F.S. 216.0 was observed fragmented. The engine was observed separated from the firewall at the examination.

The wing aileron push pull tubes were observed separated in the wing. The fuselage aileron controls were observed operational. The cockpit elevator controls were functional. The aft fuselage interconnect was observed separated. The aft push pull tube was observed separated in two locations, both from impact related damage. The rudder cables were observed separated in a tension overload type separation. The rudder was observed separated from the vertical stabilizer. The elevator torque tube was observed separated from both elevators and was separated from the elevator push pull tube.

The elevator trim tab was observed in a near neutral position. The right horizontal stabilizer and elevator remained attached to the empennage. The left horizontal stabilizer was observed separated starting at the leading edge at Stabilizer Station (S.S.) 41 and continuing inboard and aft to S.S. 20.0. The elevator remained attached to the outboard section of the horizontal stabilizer.

Both the left and right wing integral fuel tanks were compromised during the impact. The wire bundle connecting the boost pump was observed separated. When reconnected, the wire bundle

was tight. Blue, contaminant free fuel, was observed in the fuel strainer bowl. The fuel caps were observed installed in the filler neck.

The aircraft was equipped with a Garmin G-1000 and had a data card installed. The data was recorded and downloaded.

3.0 Engine Examination

The engine was shipped to the Continental Motors facility, Mobile, Alabama, for examination/test run. The test run was accomplished on May 28, 2019.

There were a few airframe related items removed in preparation for operation on the CMI test bed.

Items removed: Cooling baffles, Starter adapter, Starter motor, propeller governor, both alternators.

The following substitute or repaired parts were required for engine operation: Starter adapter, Starter Motor. Both 2,4,6 side mount legs, front mount leg on the 1,3,5 side of the engine. Turbo charger oil sump can.

The cylinders were borescoped and the following was observed: slight corrosion was noted in each cylinder. Valves indicated normal operating signatures.

The magneto-to-engine timing was checked and with the following results:

Magneto-to-Engine Timing (Specified): 24°BTDC

Left Magneto: 27°BTDC

Right Magneto: 28°BTDC

A cylinder leakage test was performed prior to the test run in accordance with the latest revision of Continental Motors M-0 Maintenance Manual with the engine at room temperature with the following results (master orifice reading – 43 PSI):

Cylinder #1 - 56/80 PSI (exhaust valve/rings) Cylinder #2 - 26/80 PSI (exhaust valve/rings)
Cylinder #3 - 71/80 PSI (exhaust valve/rings) Cylinder #4 - 69/80 PSI (exhaust valve/rings)
Cylinder #5 - 72/80 PSI (exhaust valve/rings) Cylinder #6 - 06/80 PSI (exhaust valve/rings)

(Leakage source)

The engine was not disassembled prior to the engine run. The crankshaft endplay measured .010” and the run-out was .005”.

The engine was then prepared for operation by installing the appropriate thermocouples, pressure lines and test pads for monitoring purposes. The engine was then moved to CMI test cell number 43 and mounted for operation. The engine was fitted with a test club propeller for the TSIO550C engine model.

The engine experienced a normal start on the first attempt without hesitation or stumbling in observed RPM. The engine RPM was advanced in steps for warm-up in preparation for full power operation. The engine throttle was advanced to 1200 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to 1600 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to 2100 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to 2450 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to full open position and held for five (5) minutes to stabilize. The engine throttle was rapidly advanced from idle to full throttle five times where it performed normally without any hesitation, stumbling or interruption in power.

Throughout the test phase, the engine accelerated normally without any hesitation, stumbling or interruption in power and demonstrated the ability to produce rated horsepower.

A cylinder leakage test was performed after the test run in accordance with the latest revision of Continental Motors M-0 Maintenance Manual with the engine hot with the following results (master orifice reading – 43 PSI):

Cylinder #1 - 65 /80 PSI (rings) Cylinder #3 - 60/80 PSI (rings) Cylinder #5 - 72/80 PSI (rings)

Cylinder #2 - 42/80 PSI (rings/Valve) Cylinder #4 - 71/80 PSI (rings) Cylinder #6 - 66/80 PSI (rings)

(Leakage source)

4.0 Propeller Examination

The propeller was examined at the Florida Air Recovery facility, Jacksonville, Florida, on February 7, 2019.

The propeller remained attached to the engine. The only visible damage was to the spinner, which was pushed in in one location and exhibited no signs of rotation.