

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA24LA043

ENGINE AND AIRFRAME EXAMINATION

December 27, 2023

A. ACCIDENT DETAILS

Location: Perry, Florida
Date: November 17, 2023
Time: 1708 EST
2208 UTC
Airplane: N37MB, Lancair IV-P

B. ENGINE AND AIRFRAME EXAMINATION

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C. SUMMARY

On November 17, 2023, about 1708 eastern standard time, an experimental amateur-built Lancair IV-P, N37MB, was substantially damaged when it was involved in an accident near Perry, Florida. The pilot sustained minor injuries. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The pilot reported a loss of engine power after descending and leveling off under a cloud layer at 2,000 ft msl. The pilot switched fuel tanks, and enriched the mixture; however, he was unable to restore engine power and he elected to execute a forced landing and impacted sapling pine trees. The aircraft then came to rest inverted, and the aircraft sustained substantial damage.

The engine was examined at G Fast Air in Perry, Florida. There were no anomalies observed with the airframe fuel system, and a determination was made to ship the engine to Continental Aerospace Technologies, Mobile, Alabama for an engine test run and further examination.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

Damage

The aircraft sustained substantial damage to both wings and the fuselage. The left and right wings displayed several points of impact damage that were consistent with tree impacts. The top portion of the fuselage above the cockpit was cracked and crushed downward into the cockpit area. The empennage displayed minor impact damage to the rudder. Both main landing gear assemblies remained attached to the airframe and the nose landing gear was impact damage and was displaced aft.

Fuel System

The airplane's fuel strainer was drained of residual fuel and the fuel had a color and odor consistent with 100LL Avgas. There were no signs of debris or water contamination in the retrieved fuel sample. The fuel strainer bowl was removed, and the fuel strainer screen was clear of any contamination. The fuel selector valve was found in the "LEFT" position, low pressure air was blown into the fuel strainer bowl and air could be heard and felt coming into the left fuel tank. The fuel selector valve was moved to the "RIGHT" position and low-pressure air was blown into the fuel strainer bowl; air could be heard and felt coming into the right fuel tank.

Engine Controls

The throttle, mixture, and propeller controls were noted to be secured in the cockpit and at their respective control arms at the engine. All the controls were operated in the cockpit, and it was observed that the controls operated normally at the engine.

The magneto switch was found in the "BOTH" position and the key was broken off and a portion of the key remained in the magneto switch. The "LOW" and "HIGH" boost fuel pump switches were found in the "OFF" positions.

2.0 Engine Examination

Core

The engine remained attached to the airframe through the engine mounts, cables, hoses, and wires. The engine displayed minor impact damage signatures to the top of the engine. The crankshaft was rotated by hand and continuity was established between the crankshaft, camshaft, connecting rods, and associated components. All six cylinders displayed good thumb compression and suction.

Fuel System

The fuel pump remained attached to its installation point and was undamaged. The fuel lines going to and from the fuel pump remained attached and their AN fittings were tight. The throttle and fuel metering assembly were undamaged, and all the fuel lines and manifold lines were secure to the assembly. The magneto pressurization line on the outlet of the magneto pressurization filter was noted to be disconnected from the filter. The fuel manifold valve remained secured and was undamaged. The fuel manifold valve vent line was removed from the manifold valve, and it was noted that a significant amount of fuel was in the vent line. All the fuel lines and nozzles were secure and there were no signs of fuel leaks around the nozzles or lines.

Ignition System

Both magnetos remained attached to their respective installation points and were undamaged. During crankshaft rotation, the magneto impulse coupling operation could be heard. All the ignition leads remained secured to each spark plug and to both magnetos. The bottom spark plugs were removed and visually examined. The No. 6 bottom spark plugs displayed normal wear signatures and was oil fouled, the rest of the bottom spark plugs displayed normal operating and wear signatures.

Induction and Exhaust System

The engine induction manifold displayed minor impact damage to an AN elbow on the top of the manifold. The rest of the induction system was undamaged and there were no visual signs of intake leaks observed. Both turbochargers remained attached to their installation points and were undamaged. The induction inlet filters were removed, and the turbocharger compressors displayed normal operating signatures and the turbochargers were capable of freely rotating. It was noted that during rotation there was scraping noises heard from the turbine section consistent with debris being in the turbine housing.

Future Engine Examination Plans

It was determined that the engine would be shipped to Continental Aerospace Technologies, in Mobile, Alabama to facilitate an engine test run and examination of the engine components.

3.0 Propeller Examination

The three bladed, constant speed propeller remained attached to the crankshaft and displayed impact damage to all three of the propeller blades and to the propeller spinner. All three of the propeller blades were loose in the hub and

were capable of being rotated in the hub by hand. Two of the propeller blades displayed minor aft bending deformation, the third propeller blade was bent aft approximately 45° and the cambered side of the blade displayed polishing.

Submitted by:

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