



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Hector, Minnesota	<b>Accident Number:</b>	CEN23LA182
<b>Date &amp; Time:</b>	May 11, 2023, 12:10 Local	<b>Registration:</b>	N91026
<b>Aircraft:</b>	LOEHLE ACFT CORP 5151 Mustang	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Fuel starvation	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Flight test		

## Analysis

The pilot of the experimental, amateur-built airplane overhauled the engine carburetor and modified the airplane's fuel system with an additional fuel tank after removing the airframe ballistic parachute system. The pilot also adjusted the ground-adjustable propeller to attain an engine rpm of 6,200. The pilot then performed a static ground run of the airplane for about 28 minutes before attempting a test flight.

During takeoff, with the newly installed fuel tank selected, the engine only attained 6,100 rpm and the pilot suspected that something was wrong. There was another aircraft close to the airport and the accident pilot radioed the other aircraft and notified the pilot of engine issues and asked for its position from the airport. The pilot of the other aircraft responded that they were about 3 miles from the airport. The accident pilot told the other aircraft to go ahead and land and that he would land behind him. As the accident pilot turned the airplane toward the runway, the engine lost total power and the airplane landed in a soft field about 250 ft short of the runway, resulting in substantial damage.

The pilot stated that he thought the loss of engine power was the result of fuel starvation and that there may have been a problem with the vent of the newly installed fuel tank.

Postaccident examination of the engine revealed that the front carburetor was not intact within its flange. The carburetor separation was likely due to impact forces during the accident that also damaged the engine cowl around the carburetor. There were no other mechanical anomalies noted during the examination.

Though the pilot performed an extended engine runup before flight, the runup did not account for dynamic effects from aircraft velocity that may have been simulated by performing a high-

speed taxi test to determine if the anticipated propeller speed could be attained. Also, the pilot attempted a test flight to encompass multiple system modifications and maintenance, contrary to proper flight testing by using a build-up and risk mitigating approach. Additionally, even though the pilot observed a propeller rpm that was lower than anticipated, he chose to continue the takeoff and delay the precautionary landing to allow for another airplane to land. It is possible that the pilot may have been able to land on the runway had he not chose to delay his landing.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A total loss of engine power due to fuel starvation as a result of the pilot’s modifications to the fuel system. Contributing to the accident was the pilot’s decision to continue the takeoff despite observing lower than anticipated propeller rpm, his decision to delay his precautionary landing to allow another airplane to land, and his decision to conduct flight testing of the airplane following multiple modifications.

Findings	
Personnel issues	(general) - Pilot
Personnel issues	Delayed action - Pilot
Aircraft	Descent/approach/glide path - Not attained/maintained
Aircraft	Fuel - Not specified

# Factual Information

## History of Flight

Prior to flight	Aircraft maintenance event
Takeoff	Fuel starvation (Defining event)
Landing	Collision during takeoff/land

On May 11, 2023, at 1210 central daylight time, an experimental, amateur-built 5151 Mustang, N91026, was substantially damaged when it was involved in an accident near Hector, Minnesota. The commercial pilot was uninjured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 test flight.

According to a Federal Aviation Administration (FAA) inspector, the pilot, who was not the builder of the airplane, had recently overhauled the engine carburetors and modified the airplane’s fuel system. The overhaul of the carburetors and the fuel system modification were not recorded in maintenance records. When the pilot purchased the airplane, it was equipped with an airframe ballistic parachute, which he removed, and installed a fuel tank in its place. The pilot calculated that the weight of the parachute was equal to the weight of the fuel tank and 2 gallons of fuel.

Before the accident flight, the pilot tied the tailwheel of the airplane to an anchor point and ran the engine at a high power setting for about 28 minutes to test the modifications he had made to the fuel system. He also adjusted the ground-adjustable propeller to obtain 6,200 rpm. After the ground run, he decided to test fly the airplane. During takeoff, with the newly-installed fuel tank selected, the engine only attained 6,100 rpm. He stated that suspected something was wrong. There was another aircraft close to the airport, so he radioed the other aircraft notifying the pilot of engine issues and asked the other aircraft for its position from the airport. The other aircraft responded that it was about 3 miles from the airport. The accident pilot told the other aircraft to go ahead and land and that he would land behind him. As the accident pilot turned toward the runway, the engine lost total power and the pilot was unable to glide the airplane to the runway. The airplane touched down in a soft field about 250 feet from the end of the runway. The accident pilot recovered the airplane and placed it in a hangar without the knowledge of or permission from the National Transportation Safety Board (NTSB) or FAA.

The airplane sustained substantial damage that included damage to the wing rib and lower spar cap at left main gear attach point.

Postaccident examination of the engine by an FAA inspector revealed that the front carburetor was out of its mounting flange and the clamp securing it was loose enough that the carburetor could be placed back in the flange and removed without loosening the clamp. A portion of the

left side engine cowl, near the carburetor, was torn outward and aft due to impact forces during landing. There were no other engine anomalies noted during the examination.

The pilot stated that he thought the loss of engine power was due to fuel starvation and that there may have been a problem with the vent of the newly installed fuel tank.

An NTSB Pilot/Operator Aircraft Accident/Incident Report, form 6120, was not received from the pilot.

The previous owner and builder of the airplane did not make the required logbook entry for completing Phase 1 flight testing; therefore, operation of the airplane was limited to the flight test area listed in the operating limitations of the airworthiness certificate (within 25 nautical miles of Bateman Field, Chippewa Falls, Wisconsin, excluding class C airspace). The accident flight occurred outside of the flight test area.

#### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	80, Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea; Multi-engine land	<b>Seat Occupied:</b>	Center
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	April 30, 2023
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	LOEHLE ACFT CORP	<b>Registration:</b>	N91026
<b>Model/Series:</b>	5151 Mustang	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2001	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	5151-4863808
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	1
<b>Date/Type of Last Inspection:</b>	April 22, 2023 Condition	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	117.1 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Rotax
<b>ELT:</b>		<b>Engine Model/Series:</b>	582
<b>Registered Owner:</b>	Pilot	<b>Rated Power:</b>	
<b>Operator:</b>	Pilot	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	OVL,1076 ft msl	<b>Distance from Accident Site:</b>	14 Nautical Miles
<b>Observation Time:</b>	11:55 Local	<b>Direction from Accident Site:</b>	270°
<b>Lowest Cloud Condition:</b>	Scattered / 1400 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	5 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	140°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.98 inches Hg	<b>Temperature/Dew Point:</b>	19°C / 15°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Hector, MN	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Hector, MN	<b>Type of Clearance:</b>	Unknown
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Hector Municipal Airport 1D6	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	1078 ft msl	<b>Runway Surface Condition:</b>	Vegetation
<b>Runway Used:</b>	12	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	2776 ft / 50 ft	<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	44.749606,-94.734958(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Gallo, Mitchell
<b>Additional Participating Persons:</b>	Gregory Thurston; Federal Aviation Administration, Minneapolis FSDO; Minneapolis, MN
<b>Original Publish Date:</b>	March 28, 2024
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=174524">https://data.nts.gov/Docket?ProjectID=174524</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).