Aviation Investigation Final Report

Location:	Houghton Lake, Michigan	**Accident Number:**	CEN18LA280
Date & Time:	July 8, 2018, 06:43 Local	**Registration:**	N4329R
Aircraft:	Best Off Skyranger	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a local private flight when the airplane had a sudden loss of engine power shortly after takeoff. The pilot reported that after an uneventful takeoff, as the airplane climbed through 150 ft above ground level, the engine speed rapidly decreased from 6,200 rpm to 4,700 rpm. Despite the pilot's corrective actions, the engine continued to operate at a decreased power setting and the airplane was unable to maintain altitude. The pilot reported that there were trees ahead of the airplane's flight path, so he turned into the wind and maneuvered to land on a nearby golf course fairway. The pilot stated that the airplane had insufficient altitude and airspeed to flare normally, which resulted in a hard landing and substantial damage to both wings and the empennage.

The pilot reported that he did not observe any anomalies during his preflight inspection or his before-takeoff engine runup, and that the fuel tank contained about 12 gallons of automotive fuel. A postaccident engine examination did not reveal any evidence of mechanical malfunctions or failures that would have precluded normal operation during the flight. Although the atmospheric conditions were conducive for the formation of carburetor icing, the airplane's engine was equipped with carburetors with a variable-venturi design that are generally not prone to carburetor icing. Therefore, the reason for the partial loss of engine power could not be determined with the available evidence.

Probable Cause and Findings

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

A partial loss of engine power during takeoff for undetermined reasons.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Takeoff	Loss of engine power (partial) (Defining event)
Landing	Off-field or emergency landing
Landing	Hard landing

On July 8, 2018, about 0643 eastern daylight time, a Best Off Skyranger experimental light-sport airplane, N4329R, was substantially damaged when it was involved in an accident at Houghton Lake State Airport (5Y2), Houghton Lake, Michigan. The pilot sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, he did not observe any anomalies with the airplane or its engine during the preflight inspection or the before-takeoff engine run-up. The fuel tank contained about 12 gallons of automotive fuel before the flight. The pilot reported that the takeoff roll, rotation, and initial climb from runway 16 were uneventful; however, as the airplane climbed through 150 ft above ground level, the engine speed rapidly decreased from 6,200 rpm to 4,700 rpm. He verified that the throttle was full forward, the ignition switch was selected to both, the fuel valve was open, and that available fuel was in the tank. The pilot also turned on the electric fuel pump. Despite the pilot's corrective actions, the engine continued to operate at a decreased power setting, and the airplane was unable to maintain altitude. The pilot reported that there were trees ahead of the airplane's flightpath, so he made a turn into the wind and maneuvered to land on a nearby golf course fairway. The pilot stated that the airplane had insufficient altitude and airspeed to flare normally, which resulted in a hard landing on the fairway.

A postaccident wreckage examination was completed by a Federal Aviation Administration (FAA) airworthiness inspector. The FAA inspector reported that both wings and the empennage sustained substantial damage during the forced landing. The Rotax 582 engine did not exhibit any crankcase or cylinder fractures, and there were no oil/fluid leaks observed on the exterior engine components. The firewall-mounted oil reservoir contained ample engine oil. The three-blade propeller remained attached to the engine and exhibited blade damage consistent with rotation at impact. Two spark plugs, one from each cylinder, were removed and exhibited normal wear signatures. The remaining two spark plugs were damaged during the accident and were not removed.

Both carburetors had separated from their respective induction tubes during impact; however, both carburetor throttle arms remained attached to the control cable that was continuous to the cockpit throttle. A partial disassembly of both carburetors revealed ample

automotive fuel in their respective bowls. No contamination was observed in the carburetor bowls or the fuel screens. The FAA inspector rotated the propeller by hand and confirmed mechanical continuity of the internal drivetrain components of the engine. The dual electronic ignition system appeared undamaged and was not tested. The postaccident examination did not reveal any evidence of a mechanical malfunction that would have precluded normal engine operation during the flight.

According to a carburetor icing probability chart contained in FAA Special Airworthiness Information Bulletin CE-09-35, entitled "Carburetor Icing Prevention", the recorded temperature and dew point were in the range of susceptibility for the formation of carburetor icing. The bulletin notes that if ice forms in the carburetor of a fixed-pitch propeller aircraft, the restriction to the induction airflow will result in roughness in engine operation and a drop in engine speed.

The airplane was not equipped with a carburetor heat system; however, the engine was equipped two variable-venturi sliding carburetors (e.g. sliding carburetors) that are generally not prone to carburetor icing, according to Aircraft Powerplants, Fifth Edition by Bent/McKinley.

Pilot Information

Certificate:	Sport Pilot	**Age:**	44,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Sport pilot None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 5, 2018
Flight Time:	(Estimated) 45.3 hours (Total, all aircraft), 7 hours (Total, this make and model), 12 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Best Off	**Registration:**	N4329R
Model/Series:	Skyranger No Series	**Aircraft Category:**	Airplane
Year of Manufacture:	2002	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental light sport (Special)	**Serial Number:**	481
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 7, 2018 Condition	**Certified Max Gross Wt.:**	1150 lbs
Time Since Last Inspection:	8.4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	292.7 Hrs at time of accident	**Engine Manufacturer:**	Rotax
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	582
Registered Owner:	On file	**Rated Power:**	65 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HTL,1150 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	06:53 Local	**Direction from Accident Site:**	71°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.32 inches Hg	**Temperature/Dew Point:**	17°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houghton Lake, MI	**Type of Flight Plan Filed:**	None
Destination:	Houghton Lake, MI	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Houghton Lake State 5Y2	**Runway Surface Type:**	Grass/turf
Airport Elevation:	1165 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16	**IFR Approach:**	None
Runway Length/Width:	2750 ft / 104 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	44.32611,-84.78833(est)

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Michael W Matthews; Federal Aviation Administration, Grand Rapids FSDO; Grand Rapids, MI
Original Publish Date:	May 27, 2021
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97817