Aviation Investigation Final Report

Location:	Warsaw, Kentucky	**Accident Number:**	ERA18LA158
Date & Time:	June 3, 2018, 09:45 Local	**Registration:**	N8698
Aircraft:	Bellanca 7ECA	**Aircraft Damage:**	Substantial
Defining Event:	Preflight or dispatch event	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After a preflight inspection and engine run up revealed no anomalies, the pilot attempted to takeoff from an upsloping turf runway. The initial takeoff roll was normal; however, as the airplane reached 60 knots, the pilot determined that the airplane's acceleration was not "normal" and that the airplane would not clear the trees at the end of the runway, nor be able to stop within the remaining runway. The pilot then rejected the takeoff, applied full rudder, and the airplane ground looped, resulting in substantial damage to the fuselage.

A cursory examination of the engine did not reveal any preimpact mechanical anomalies that would have precluded normal operation; however, the examination did not determine whether the engine was capable of developing its full rated power during the accident takeoff.

The runway measured 1,100 ft by 125 ft and had an approximate 3% slope. The calculated density altitude at the time of the accident was about 2,389 ft, and the wind reported at the nearest weather observation facility would have provided a headwind component of about 3 knots for the takeoff runway. According to the pilot's operating handbook, at maximum gross weight, the airplane would have required about 938 ft to clear a 50-ft obstacle, given the wind conditions and a dry, level grass runway; however, the actual distance required would have been greater than the calculated 938 ft due to the upsloping runway.

It is likely that the reduced acceleration noticed by the pilot was the result of decreased engine performance due to the density altitude combined with the upsloping runway, both of which would have increased the runway distance required to reach takeoff speed. It is also likely that even with full engine power, given the conditions on the day of the accident, the runway distance required would have been close to or exceeded the runway length available. Although the pilot acted appropriately by aborting the takeoff upon realizing that the airplane would not clear the trees at the end of the runway, his delayed decision to abort resulted in insufficient runway remaining on which to slow and stop the airplane.

Probable Cause and Findings

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

The pilot's inadequate preflight performance planning, and his delayed decision to abort the takeoff, which resulted in a ground loop.

Findings

Personnel issues	Performance calculations - Pilot
Personnel issues	Decision making/judgment - Pilot
Aircraft	Directional control - Not specified

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event (Defining event)
Takeoff-rejected takeoff	Loss of control on ground

On June 3, 2018, about 0945 eastern daylight time, a Bellanca 7ECA, N8698, was substantially damaged when it was involved in an accident near Warsaw, Kentucky. The airline transport pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, the preflight inspection, engine start, taxi and engine run-up were normal. During takeoff, he applied full power and the initial takeoff roll was normal; however, as the airspeed reached 60 mph, he noticed "the aircraft acceleration to not be normal." He determined that the airplane would not clear the trees at the end of the runway and that he would be unable to stop the airplane before the end of the runway. He rejected the takeoff, applied right rudder, and the airplane ground-looped and stopped. The pilot later reported that the "engine lost power on takeoff."

The airport was a private, unpublished turf field with one runway, 1,100 ft long by 125 ft wide, oriented north-south with an elevation of about 800 ft mean sea level (msl) at its southern end which increased (uphill) to about 835 ft at its northern end (a gradient of about 3%). The pilot attempted the takeoff toward the north. The grass was "short" and had recently been mowed. The airplane was based at the airport.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed substantial damage to the fuselage aft of the rear window. Fuel was present in both wing tanks. The propeller was rotated by hand; thumb compression and suction were confirmed on all four cylinders. All engine controls were intact from the cockpit to their respective location on the engine. The air intake was unobstructed. The carburetor inlet screen was absent of debris, and the carburetor bowl contained fuel.

According to FAA airmen records, the pilot held an airline transport pilot certificate with a rating for airplane multiengine land, and commercial privileges for airplane single engine land. He held a BasicMed certification. The pilot reported a total of 14,500 hours of flight experience, of which 250 hours were in the accident airplane make and model.

At 0952, the reported weather at Cincinnati – Northern Kentucky International Airport (CVG), Covington, Kentucky, about 16 nautical miles north of the accident site, included wind from 290° at 12 knots, temperature 24°C, dew point 20°C, and an altimeter setting of 29.86. The calculated density altitude for the 800-ft elevation airport was 2,389 ft.

A review of the take-off/climb performance table in the pilot's operating handbook revealed that the runway distance required to clear a 50-ft obstacle would be 1,202 ft for a level, paved runway, at a maximum gross weight of 1,650 lbs. At the time of the accident, the airplane weighed about 1,412 lbs.

Calculations adjusting for the airplane weight, the turf runway, and the headwind component (about 3 knots), yielded a distance required of about 938 ft for a level runway.

The Airplane Flying Handbook (FAA-H-8083-3B) states:

Prior to takeoff, the pilot should identify a point along the runway at which the airplane should be airborne. If that point is reached and the airplane is not airborne, immediate action should be taken to discontinue the takeoff. Properly planned and executed, the airplane can be stopped on the remaining runway without using extraordinary measures, such as excessive braking that may result in a loss of directional control, airplane damage, and/or personal injury.

Pilot Information

Certificate:	Airline transport	**Age:**	67,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	BasicMed None	**Last FAA Medical Exam:**	
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 16, 2017
Flight Time:	14500 hours (Total, all aircraft), 250 hours (Total, this make and model), 12000 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bellanca	**Registration:**	N8698
Model/Series:	7ECA NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	922-73
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	May 5, 2018 Annual	**Certified Max Gross Wt.:**	1650 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1273 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-235-C1
Registered Owner:		**Rated Power:**	115 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:	CVG,883 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	09:52 Local	**Direction from Accident Site:**	18°
Lowest Cloud Condition:	Scattered / 1400 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 4500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.86 inches Hg	**Temperature/Dew Point:**	24°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Warsaw, KY	**Type of Flight Plan Filed:**	None
Destination:	Warsaw, KY	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Private unnamed airport PVT	**Runway Surface Type:**	Grass/turf
Airport Elevation:	800 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:	none	**IFR Approach:**	None
Runway Length/Width:	1100 ft / 125 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	38.792499,-84.774719(est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass		
Additional Participating Persons:	Jamelle Poppe; FAA/FSDO; Louisville, KY		
Original Publish Date:	June 10, 2021	**Investigation Class:**	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97393		