Aviation Investigation Final Report

Location:	Hastings, Florida	**Accident Number:**	ERA19LA227
Date & Time:	July 14, 2019, 07:59 Local	**Registration:**	N7833D
Aircraft:	Piper PA22	**Aircraft Damage:**	Substantial
Defining Event:	Fuel related	**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that, during takeoff, the airplane did not accelerate to rotation speed within its normal takeoff roll distance, but he continued the takeoff and the airplane lifted off near the end of the runway. Just after liftoff, the landing gear impacted vegetation at the end of the runway. The pilot believed the airplane was stalling and attempted to “get the airspeed up”; however, the airplane impacted a tree and then the ground, resulting in substantial damage.

Examination of the wreckage revealed that the engine primer was in the unlocked position, and the spark plugs were black and sooty. The unlocked primer, which fed fuel to all four cylinders, likely resulted in an overly rich fuel mixture. The pilot recalled that, at the time of liftoff, the engine speed was 2,400 rpm. According to the owner’s manual, the maximum engine speed was 2,700 rpm. It is likely that the excessively rich fuel mixture prevented the engine from reaching full power during the takeoff roll and resulted in the increased takeoff distance and poor climb performance.

Additionally, the wheel bearings on all three landing gear were found to have excessive side play. This may have resulted in additional drag during the takeoff roll, which if present, would have further decreased the takeoff performance. The extent to which this may have contributed to the accident could not be determined.

Probable Cause and Findings

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

The pilot's failure to secure the engine primer control, which resulted in an overly rich fuel/air mixture and degraded engine performance. Contributing to the accident was the pilot's failure to abort the takeoff in a timely manner.

Findings

Personnel issues	Use of equip/system - Pilot
Aircraft	Landing gear/wheel fairing - Not serviced/maintained
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Takeoff	Fuel related (Defining event)
Initial climb	Low altitude operation/event
Initial climb	Aerodynamic stall/spin

On July 14, 2019, at 0759 eastern daylight time, a Piper PA22-150, N7833D, was substantially damaged when it was involved in an accident in Hastings, Florida. The pilot and passenger sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that, before takeoff, he completed a preflight inspection and engine runup that revealed no anomalies. He applied the brakes, advanced the throttle to full power, and released the brakes to take off. During the takeoff roll, he noticed that the airplane did not lift off in its “normal distance” and he continued the takeoff roll until the airspeed reached 50 to 55 knots, as the airplane neared the end of the runway. The airplane became airborne and the landing gear impacted vegetation at the end of the runway. He believed that the airplane was stalling and attempted to “get the airspeed up”; however, the airplane impacted a tree and then the ground.

According to a witness who was mowing the turf runway, the grass was "really high and wet." He was mowing the perimeter of the runway when he noticed the accident airplane performing an engine run-up, so he mowed one 12-ft pass down the center of the runway before the airplane took off. He watched the airplane take off to the north and noticed that it used nearly the entire 2,300-ft-long runway before lifting off. The airplane remained within the recently-mowed section of the runway during the takeoff roll. He stated that after liftoff, the airplane flew through tall cornstalks located in a field adjacent to the runway and continued to gain altitude. The airplane then made a left turn toward a crosswind traffic pattern leg followed by another left turn toward a downwind leg. During the turns, the airplane descended behind a row of trees before he lost sight of it.

The pilot stated that the engine “was fine” and that he “just didn’t get enough airspeed.” He recalled that, at the time of rotation, the engine speed was 2,400 rpm.

A review of an airplane owner’s manual for the same make and model airplane revealed that the engine’s maximum speed was 2,700 rpm. The engine data plate and tachometer markings found on the airplane both indicated the maximum speed was 2,700 rpm.

Examination of the wreckage by a Federal Aviation Administration (FAA) inspector revealed that all major components of the airplane were present at the accident site. The airplane came to rest inverted. Both wings were impact damaged and separated from the fuselage at the wing

root. The engine and upper cowling were separated at the firewall. The fuel primer control was unlocked and extended about 1/8 to 1/4 inch from the closed position. The mixture control and throttle were at or near the full forward position.

A follow-up examination of the engine revealed that the spark plug electrodes were black in color and sooty. The engine crankshaft was rotated manually using a tool attached to an accessory drive gear, and thumb compression and suction was present on all four cylinders. Continuity of the crankshaft and valvetrain was confirmed. Both magnetos produced spark on all towers when rotated by hand. The engine priming system was of the type that fed fuel to all four cylinders independently. The wheel bearings in all three landing gear were found to have excessive side play.

Pilot Information

Certificate:	Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	April 14, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 13, 2017
Flight Time:	227 hours (Total, all aircraft), 84.8 hours (Total, this make and model), 104.3 hours (Pilot In Command, all aircraft), 10.3 hours (Last 90 days, all aircraft), 3.9 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7833D
Model/Series:	PA22 150	**Aircraft Category:**	Airplane
Year of Manufacture:	1957	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	22-5479
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 1, 2019 Annual	**Certified Max Gross Wt.:**	2000 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	O-320 -A2B
Registered Owner:	On file	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	Pilot school (141)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SGJ,10 ft msl	**Distance from Accident Site:**	18 Nautical Miles
Observation Time:	11:56 Local	**Direction from Accident Site:**	29°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.15 inches Hg	**Temperature/Dew Point:**	26°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hastings, FL	**Type of Flight Plan Filed:**	None
Destination:	Hastings, FL	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class E

Airport Information

Airport:	Earle Airpark 13FA	**Runway Surface Type:**	Grass/turf
Airport Elevation:	25 ft msl	**Runway Surface Condition:**	Soft
Runway Used:	36	**IFR Approach:**	None
Runway Length/Width:	2300 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	29.693332,-81.506942(est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Peter Kandravi; FAA/FSDO ; Orlando, FL
Original Publish Date:	March 30, 2022
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=99837