Aviation Investigation Final Report

Location:	Crosby, Texas	**Accident Number:**	CEN23LA108
Date & Time:	February 12, 2023, 17:28 Local	**Registration:**	N3238L
Aircraft:	Cessna 172H	**Aircraft Damage:**	Substantial
Defining Event:	Collision during takeoff/land	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was performing a soft-field takeoff from a 2,700 ft soft, dry grass runway. According to the pilot, during the takeoff roll the soft terrain seemed to impede his airspeed, so he decided to perform a soft-field takeoff in ground effect. About half the distance down the airstrip, the pilot considered aborting the takeoff because he was concerned the airplane was not gaining enough airspeed to climb and avoid a moving train that was on the railroad track. He ultimately did not abort the takeoff, as he thought he would not be able to stop in time to avoid a collision with the train. As the airplane neared the moving train, the pilot pulled up the control yoke to initiate a climb; however, the airplane's right main landing gear contacted the moving train. The airplane nosed down, impacted terrain, and came to rest inverted. The airplane sustained substantial damage to the fuselage and wings. A pilot-rated witness stated that it did not appear the airplane reached proper airspeed during the takeoff.

Postaccident examination revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Based on the airplane's weight and the ambient conditions, the manufacturer's predicted takeoff distance to clear a 50 ft obstacle was about 1,200 ft. It is likely the pilot's delayed decision to perform a soft-field takeoff procedure resulted in the airplane not adequately accelerating to a proper airspeed and climb rate.

Probable Cause and Findings

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

The pilot’s delayed soft-field takeoff procedure, which prevented the pilot from achieving adequate airspeed and a proper climb rate resulting in a collision with a moving train.

Findings

Personnel issues	Delayed action - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Climb rate - Not attained/maintained

Factual Information

History of Flight

Initial climb	Collision during takeoff/land (Defining event)

On February 12, 2023, about 1728 central standard time, a Cessna 172H airplane, N3238L, sustained substantial damage when it was involved in an accident near Crosby, Texas. The pilot sustained serious injuries, and the passenger sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, he and the passenger had landed earlier that day to discuss some upcoming airplane maintenance items with the owner of the private airstrip. Being unfamiliar with the 2,700 ft long airstrip, the pilot asked the owner about the best direction to complete the takeoff for the return flight. The owner advised to depart runway 9, and that a railroad track, located about 300 ft off the departure end of the dry grass airstrip, would not be a factor. The pilot reported that during the takeoff roll, the soft terrain "seemed to impede our speed somewhat, so I decided to perform a soft field takeoff in ground effect." About half the distance down the airstrip, the pilot considered aborting the takeoff because he was concerned the airplane was not gaining enough airspeed to climb and avoid a moving train that was on the railroad track. However, he did not abort the takeoff as he thought he would not be able to stop in time to avoid a collision with the train. As the airplane neared the moving train, the pilot pulled back the control yoke to initiate a climb; however, the airplane's right main landing gear contacted the moving train. The airplane then nosed down, impacted terrain, and came to rest inverted. The pilot stated that this was the first time he had operated an airplane at that airstrip and it had been about 4 years since he performed a soft-field takeoff.

A witness, who frequently operated his airplane at the airstrip, reported that it appeared the pilot was initially back taxing the airplane for takeoff on runway 27 because the pilot did not apply full power, and the airplane was slowly accelerating down the runway. The witness then realized the pilot was attempting to take off after the airplane's airspeed slowly increased. He stated the airplane never developed "flying airspeed," and as the airplane approached the moving train it rapidly pitched up, stalled, and impacted the train.

Postaccident examination of the airplane showed substantial damage to the fuselage and both wings. Flight control continuity was established from the cockpit to all flight control surfaces. The engine was partially separated from the airplane, and both propeller blades displayed leading edge gouging, forward twist deformation, chordwise scratching, and both blade tips were separated. The wing flaps were in the retracted position. The examination revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

The pilot estimated the airplane's weight was about 300 pounds less than the maximum gross weight. The manufacturer's specifications predicted that the takeoff distance to clear a 50 ft

obstacle was 1,095 ft. The pilot operating handbook recommended increasing takeoff distance by 7% for operation on a dry, grass runway. Based on the ambient temperature and wind conditions at the time of the accident, predicted takeoff distance to clear a 50 ft obstacle was about 1,200 ft.

The Federal Aviation Administration Airplane Flying Handbook (FAA-H-8083-38) contains the following information for a soft-field takeoff:

After the airplane becomes airborne, the pilot should gently lower the nose with the wheels clear of the surface to allow the airplane to accelerate to Vy, or Vx if obstacles must be cleared. … An attempt to climb prematurely or too steeply may cause the airplane to settle back to the surface as a result of the loss of ground effect. … During the transition out of the ground effect area, the pilot should not attempt to climb out of ground effect before reaching the sufficient climb airspeed, as this may result in the airplane being unable to climb further, even with full power applied. Therefore, it is essential that the airplane remain in ground effect until at least Vx is reached.

Pilot Information

Certificate:	Recreational	**Age:**	75,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	BasicMed Without waivers/limitations	**Last FAA Medical Exam:**	September 13, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 13, 2022
Flight Time:	190 hours (Total, all aircraft), 15 hours (Total, this make and model), 12 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3238L
Model/Series:	172H	**Aircraft Category:**	Airplane
Year of Manufacture:	1967	**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	17256138
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 2, 2022 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4667.2 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	O-300-D
Registered Owner:	On file	**Rated Power:**	145 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:	KIAH,90 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	22:53 Local	**Direction from Accident Site:**	286°
Lowest Cloud Condition:	Few / 18000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	18°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Crosby, TX	**Type of Flight Plan Filed:**	None
Destination:	Houston, TX (IWS)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class E

Airport Information

Airport:	DUNHAM FLD 1XS1	**Runway Surface Type:**	Grass/turf
Airport Elevation:	60 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	09	**IFR Approach:**	None
Runway Length/Width:	2700 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	29.937852,-95.041393(est)

Administrative Information

Investigator In Charge (IIC):	Sauer, Aaron
Additional Participating Persons:	Daniel Prince; FAA; Houston, TX Andrew Hall; Textron Aviation; Wichita, KS
Original Publish Date:	March 28, 2024
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=106727