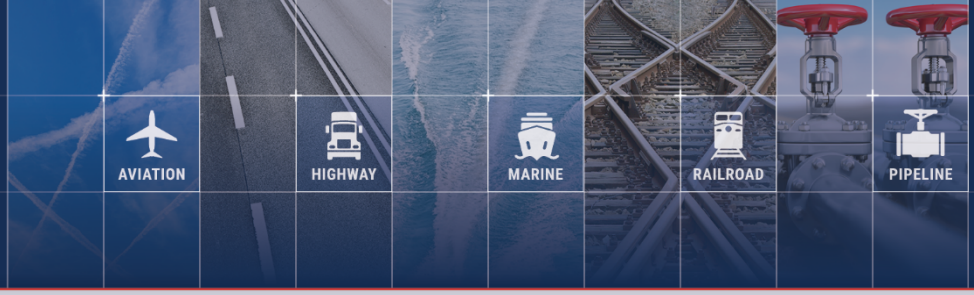

Aviation Investigation Final Report

Location:	Chandler, Arizona	**Accident Number:**	WPR21LA287
Date & Time:	July 10, 2021, 07:30 Local	**Registration:**	N222HC
Aircraft:	Beech A36TC	**Aircraft Damage:**	Substantial
Defining Event:	Collision during takeoff/land	**Injuries:**	1 Serious, 3 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that before takeoff he calculated the airplane's takeoff weight, which he determined to be near the maximum gross takeoff weight with a center of gravity (CG) on the forward edge of the CG envelope. The takeoff calculations assumed that the airplane could sufficiently clear a 50-ft obstacle during the takeoff ground roll. During the takeoff, the pilot reported that the engine sound and indications were normal for the takeoff roll but that acceleration was slightly slower and the ground roll longer than predicted. The pilot did not abort the takeoff because he thought that the slower acceleration and longer ground roll were related to the outside air temperature, which was about 91°F. After liftoff, the pilot kept the nose lowered to build airspeed. After the landing gear was retracted, the airplane did not accelerate or climb. The airspeed was getting slower, and the stall warning was activating intermittently. As the airplane neared the end of the runway, the pilot aborted the takeoff and landed the airplane just beyond the departure end of the runway in dirt. The airplane slid on its belly and subsequently collided with an airport fence. The wings were substantially damaged, and a postimpact fire ensued.

Examination of the engine revealed no preaccident mechanical failures or malfunctions that would have precluded normal operation. It is likely that the combination of a high gross airplane weight and a high outside temperature resulted in a ground roll that was longer than the pilot expected based on his takeoff calculations. By the time that the pilot aborted the takeoff, the airplane was operating at or near the stall speed and was thus not able to gain altitude.

Probable Cause and Findings

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

The pilot's delayed decision to abort the takeoff due to insufficient airspeed.

Findings

Personnel issues	Decision making/judgment - Pilot
Aircraft	Airspeed - Not attained/maintained

Factual Information

History of Flight

Takeoff-rejected takeoff	Collision during takeoff/land (Defining event)

On July 10, 2021, about 0730 mountain standard time, a Beech A36TC, N222HC, was substantially damaged when it was involved in an accident at Chandler, Arizona. One passenger sustained serious injuries, and the pilot and two passengers sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that, before takeoff, he calculated the takeoff weight to be 3,794 pounds and the center of gravity (CG) to be on the forward edge of the CG envelope. The maximum certified gross weight for the airplane was 3,833 pounds. The pilot also calculated the takeoff distance to clear a 50 ft obstacle to be about 3,000 ft for an outside temperature of 90°F. The length of the runway to be used for takeoff was 4,400 ft.

The pilot reported that the preflight inspection and the engine start, taxi, and pretakeoff checks were normal. The pilot further reported that the engine sound and indications were normal for the takeoff roll but that the airplane's acceleration was "slightly slower than expected" and the ground roll was "longer than predicted." The pilot did not abort the takeoff because "given the high OAT [outside air temperature], this was not…indicative of a problem." He did not recall the speed for rotation but reported that it was within the range for takeoff.

After liftoff, the pilot lowered the airplane's nose to allow the airplane to accelerate. After the landing gear was retracted, the airplane did not accelerate or climb, the airspeed was getting slower, and the stall warning was activating intermittently. As the airplane was nearing the end of the runway, the pilot aborted the takeoff, and the airplane landed just beyond the departure end of the runway and into dirt. The airplane slid on its belly and subsequently collided with an airport fence. The wings were substantially damaged, and a postimpact fire ensued.

Postaccident examination revealed extensive thermal damage throughout the engine. All engine accessories and the propeller hub remained attached to the engine. All engine accessories were removed along with the upper spark plugs and rocker box covers. The crankshaft was rotated by hand using the propeller. Thumb compression and suction was obtained on all six cylinders. The intake and exhaust valve rocker arms on all cylinders exhibited equal movement when the crankshaft was rotated.

The turbo-charger waste gate remained attached in its installed position. The butterfly valve was in the open position. The control arm was actuated using a hand tool, and the butterfly

valve opened once pressure was released. The turbine and compressor impellers spun freely by hand with no binding noted. The compressor and turbine impellers were intact with slight lateral play in the shaft between the compressor and turbine impellers along with slight rub marks on the housing.

No preaccident mechanical failures or malfunctions were found that would have precluded normal operation of the engine.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	January 7, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 26, 2021
Flight Time:	2026 hours (Total, all aircraft), 1293 hours (Total, this make and model), 1913 hours (Pilot In Command, all aircraft), 54 hours (Last 90 days, all aircraft), 22 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	Male
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:	**Age:**	Female
Airplane Rating(s):	**Seat Occupied:**	Left
Other Aircraft Rating(s):	**Restraint Used:**	3-point
Instrument Rating(s):	**Second Pilot Present:**	Yes
Instructor Rating(s):	**Toxicology Performed:**	
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

Passenger Information

Certificate:	**Age:**	Female
Airplane Rating(s):	**Seat Occupied:**	Right
Other Aircraft Rating(s):	**Restraint Used:**	3-point
Instrument Rating(s):	**Second Pilot Present:**	Yes
Instructor Rating(s):	**Toxicology Performed:**	
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N222HC
Model/Series:	A36TC	**Aircraft Category:**	Airplane
Year of Manufacture:	1981	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	EA-259
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	June 13, 2021 Annual	**Certified Max Gross Wt.:**	3849 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4491 Hrs at time of accident	**Engine Manufacturer:**	TCM
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIO-520-UB6B
Registered Owner:	B L AVIATION LLC	**Rated Power:**	300 Horsepower
Operator:	B L AVIATION LLC	**Operating Certificate(s) Held:**	None
Operator Does Business As:	Mudd Flyers	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCHD,1236 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	07:47 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 15000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.88 inches Hg	**Temperature/Dew Point:**	33°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Chandler, AZ (KCHD)	**Type of Flight Plan Filed:**	None
Destination:	Sedona, AZ (KSEZ)	**Type of Clearance:**	VFR
Departure Time:	07:30 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Chandler Municipal CHD	**Runway Surface Type:**	Asphalt
Airport Elevation:	1243 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	22R	**IFR Approach:**	None
Runway Length/Width:	4401 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious, 2 Minor	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 3 Minor	**Latitude, Longitude:**	33.265377,-111.82106(est)

Administrative Information

Investigator In Charge (IIC):	Bledsoe, James
Additional Participating Persons:	Dale Adams; FSDO ; Scottsdale, AZ Christopher Kennedy; FAA FSDO; Scottsdale , AZ
Original Publish Date:	June 14, 2023
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=103555