# Aviation Investigation Final Report

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| **Location:** | Ranger, Texas | **Accident Number:** | CEN20LA004 |
| **Date & Time:** | October 6, 2019, 08:35 Local | **Registration:** | N36LS |
| **Aircraft:** | Beech B36 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Unknown or undetermined | **Injuries:** | 4 None |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot and three passengers were departing on a cross-country flight from a turf runway. The pilot stated that he used a soft-field takeoff technique, and once the airplane became airborne in ground effect, it did not accelerate as expected. The engine was producing power; however, there was a lack of acceleration and a “mushy” feeling. The airspeed continued to decrease, and the pilot banked the airplane left to make an emergency landing off the left side of the runway. The pilot heard the airplane’s stall warning horn, and the airplane collided with small trees and came to rest upright.

A postaccident test run of the engine revealed no anomalies that would have prevented normal operation or production of rated power.

Data from an engine data monitor revealed that, during the accident takeoff, the engine speed reached about 2,700 rpm, the engine manifold pressure was 35.2 inches of mercury (inHg), and the fuel flow reached 40.5 gallons per hour (gph). A review of the previous three flights showed that the fuel flow regularly reached 38 to 40 gph during takeoff. The airplane flight manual stated that at 2,700 rpm and 36.0 inHg, the maximum fuel flow was 34.2 gph. The reason for this difference was not determined.

## Probable Cause and Findings

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

A lack of climb performance after takeoff for reasons that could not be determined based on the available information.

## Findings

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| **Aircraft** | (general) - Unknown/Not determined |

## Factual Information

### History of Flight

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| **Initial climb** | Unknown or undetermined (Defining event) |

On October 6, 2019, about 0835 central daylight time, a Beechcraft B36TC airplane, N36LS, was substantially damaged when it was involved in an accident near Ranger, Texas. The pilot and three passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that, during the soft field takeoff roll, he advanced the throttle and confirmed normal power indications on the gauges. As the airplane accelerated, he noted 50 knots indicated airspeed and increasing, until it reached 70 knots, when he applied back pressure on the yoke and rotated. The airplane lifted off and flew over the runway in ground effect. While in ground effect, he noticed that the airplane stopped accelerating and felt "mushy," but the engine was still producing power. He added that he “did not hear or feel any pops, bangs, vibrations, smells, or otherwise that would have triggered [him] to believe that it was an immediate total engine power failure.” The airspeed indicator showed about 70 knots and was slowly decreasing. The pilot identified a field to the left of the runway and banked left about 15 to 20°, he heard the stall warning horn activate, then heard the underside of the airplane contact some small trees. The airplane landed hard in the field, impacted trees, and came to rest upright. The landing gear remained extended during the entire sequence.

The airplane sustained substantial damage to the fuselage and left wing. A postaccident examination revealed that the fuel pump was OFF, which is the setting prescribed in the airplane’s takeoff procedures. About 25 gallons of fuel was recovered from right tank and the left tank was empty, as it was breached from the impact sequence.

The airplane was equipped with a JPI engine data monitor (EDM) 900. Data retrieved from the unit revealed that, during the accident takeoff, the engine speed reached about 2,700 rpm, the engine manifold pressure was 35.2 inches of mercury (inHg), and the fuel flow reached 40.5 gph. A review of the previous three flights showed that the fuel flow regularly reached 38 to 40 gph during takeoff. The airplane flight manual stated that at 2,700 rpm and 36.0 inHg, the maximum fuel flow is 34.2 gph.

The engine was prepared and secured on a trailer for a functional test run. The avionics and engine monitor had been previously removed and were not reinstalled for the test run. The instrument panel did not feature any backup instruments to reference. The fuel pump was used to prime the engine and it started normally. The engine ran for 7 minutes. The throttle was advanced to full power four consecutive times and the engine produced full power. The engine was allowed to run at full power for 30 to 45 seconds each time. Every time the throttle reached the full forward position, the turbocharger engaged and was noticeably audible from inside the

cockpit. The auxiliary fuel pump was set to LOW and OFF during the engine run and produced the same results for each setting. Additionally, during the test run, the pump was briefly set to HIGH with no anomalies noted. The engine did not exhibit any anomalies during the test run that would have prevented a normal production of power.

## Pilot Information

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| **Certificate:** | Airline transport; Military | **Age:** | 41,Male |
| **Airplane Rating(s):** | Single-engine land; Single-engine sea; Multi-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | Balloon | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 2 Without waivers/limitations | **Last FAA Medical Exam:** | January 29, 2019 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 3792 hours (Total, all aircraft), 47 hours (Total, this make and model), 2470 hours (Pilot In Command, all aircraft), 51 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) | | |

## Passenger Information

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| **Certificate:** | | **Age:** | Male |
| **Airplane Rating(s):** | | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | | **Toxicology Performed:** | |
| **Medical Certification:** | | **Last FAA Medical Exam:** | |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | | | |

## Passenger Information

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|---|---|---|
| **Certificate:** | **Age:** | Male |
| **Airplane Rating(s):** | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | **Toxicology Performed:** | |
| **Medical Certification:** | **Last FAA Medical Exam:** | |
| **Occupational Pilot:** | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | | |

## Passenger Information

| | | |
|---|---|---|
| **Certificate:** | **Age:** | Male |
| **Airplane Rating(s):** | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | **Second Pilot Present:** | No |
| **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

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| **Aircraft Make:** | Beech | **Registration:** | N36LS |
| **Model/Series:** | B36 TC | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 1984 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Utility | **Serial Number:** | EA-431 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | December 7, 2018 Annual | **Certified Max Gross Wt.:** | 3850 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 3780.4 Hrs as of last inspection | **Engine Manufacturer:** | Continental Motors |
| **ELT:** | Installed | **Engine Model/Series:** | TSIO-520-UB |
| **Registered Owner:** | On file | **Rated Power:** | 300 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | | **Distance from Accident Site:** | 51 Nautical Miles |
| **Observation Time:** | | **Direction from Accident Site:** | 268° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | |
| **Lowest Ceiling:** | | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 10 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 190° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30.01 inches Hg | **Temperature/Dew Point:** | 24°C / 17°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Ranger, TX (F23 ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Forth Worth, TX (T67) | **Type of Clearance:** | None |
| **Departure Time:** | | **Type of Airspace:** | Class E |

## Airport Information

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| **Airport:** | Ranger Muni F23 | **Runway Surface Type:** | Grass/turf |
| **Airport Elevation:** | 1470 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 19 | **IFR Approach:** | None |
| **Runway Length/Width:** | 3415 ft / 75 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 3 None | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 4 None | **Latitude, Longitude:** | 32.447498,-98.682777(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Lindberg, Joshua |
| **Additional Participating Persons:** | Albert Hilliard; Federal Aviation Administration; Lubbock, TX<br>Kurt Gibson; Continental Motors; Mobile, AL |
| **Original Publish Date:** | March 23, 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=100384 |