# Aviation Investigation Final Report

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| **Location:** | AITKIN, Minnesota | **Accident Number:** | CHI97LA210 |
| **Date & Time:** | July 13, 1997, 14:10 Local | **Registration:** | N9746G |
| **Aircraft:** | Cessna A188B | **Aircraft Damage:** | Substantial |
| **Defining Event:** | | **Injuries:** | 1 Minor |
| **Flight Conducted Under:** | Part 137: Agricultural | | |

## Analysis

The pilot said the airplane accelerated normally to climb speed during takeoff. At about 100 feet above ground level (AGL), he noticed that the manifold pressure was low. 'All other engine readings appeared normal. The engine rapidly lost power.' The pilot attempted to land in a hay field adjacent to the airport. During touchdown, the main gear dug into wet/soft ground, and the airplane nosed over. The pilot said, 'Engine power at touchdown was minimal to zero.' Examination of the airplane revealed no anomalies. The pilot said that he could not remember how the switches were configured for takeoff. A note in the Cessna A188B Owner's Manual under HOT WEATHER/HOT ENGINE START (300 Horsepower Engine) stated, 'During a restart after a brief shutdown in extremely hot weather, the presence of fuel vapor may require the auxiliary fuel pump to operate in the 'ON' position for up to 1 minute or more before the vapor is cleared sufficiently to obtain 8 to 10 gallons/hour for starting.' A paragraph in the Cessna A188B Owner's Manual under TAKE-OFF stated, 'With 300 horsepower engines, it is important that the auxiliary fuel pump be turned off for take-off. Otherwise, the mixture will be excessively rich, causing a serious loss in power.'

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: loss of engine power for undetermined reason(s). A factor relating to the accident was: the wet/soft terrain in the emergency landing area.

## Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) REASON FOR OCCURRENCE UNDETERMINED
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Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF
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Occurrence #3: NOSE OVER
Phase of Operation: EMERGENCY LANDING

Findings
2. (F) TERRAIN CONDITION - WET
3. (F) TERRAIN CONDITION - SOFT

## Factual Information

On July 13, 1997, at 1410 central daylight time (cdt), a Cessna A188B, N9746G, operated by an airline transport pilot, sustained substantial damage when on initial climb the airplane's engine lost power. The pilot set the airplane down in a field where during the subsequent landing attempt, the airplane nosed over. Visual meteorological conditions prevailed at the time of the accident. The aerial application flight was being conducted under 14 CFR Part 137. A flight plan was not on file. The pilot reported minor injuries. The local flight originated at Aitkin, Minnesota, at 1410 cdt.

In his written statement, the pilot said that this was the airplane's second takeoff of the day. The airplane accelerated normally to climb speed during takeoff. At approximately 100 feet above ground level (AGL), the pilot noticed that the manifold pressure was low. "All other engine readings appeared normal. The engine rapidly lost power." The pilot attempted to land in a hay field adjacent to the airport. During the touchdown the airplane's main gear dug into the wet, soft ground. The airplane nosed over on its back. The pilot said, "Engine power at touchdown was minimal to zero."

A deputy for the Aitkin County, Minnesota, Sheriff's Department described the wreckage at the scene to a Federal Aviation Administration (FAA) inspector. The airplane's forward fuselage, to include the engine and cowling, was crushed down and rearward. The engine mounts were bent down and aft. The airplane's cockpit was crushed inward. The empennage was crushed down and to the side. The outboard leading edges and upper surfaces of both wings showed skin wrinkling. One of the propeller blades was bent aft.

The airplane was moved to Aitkin Airport, Aitkin Minnesota, where flight control continuity was examined and confirmed by an airframe and powerplant mechanic. The airplane's engine was restarted and ran normally. No anomalies were found with the engine controls, or other airplane systems.

The FAA inspector spoke to the pilot following the accident. The pilot said that he could not remember how he had his switches configured for takeoff.

A note in the Cessna A188B Owner's Manual under HOT WEATHER/HOT ENGINE START (300 Horsepower Engine) states, "During a restart after a brief shutdown in extremely hot weather, the presence of fuel vapor may require the auxiliary fuel pump to operate in the "ON" position for up to 1 minute or more before the vapor is cleared sufficiently to obtain 8 to 10 gallons/hour for starting."

A paragraph in the Cessna A188B Owner's Manual under TAKE-OFF states, "With 300 horsepower engines, it is important that the auxiliary fuel pump be turned off for take-off.

Otherwise, the mixture will be excessively rich, causing a serious loss in power."

## Pilot Information

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| **Certificate:** | Airline transport; Flight instructor | **Age:** | 58,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Center |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | Airplane single-engine | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 1 Valid Medical--w/ waivers/lim | **Last FAA Medical Exam:** | June 2, 1997 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 25000 hours (Total, all aircraft), 1200 hours (Total, this make and model), 23000 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Cessna | **Registration:** | N9746G |
| **Model/Series:** | A188B A188B | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Restricted (Special) | **Serial Number:** | 18801586T |
| **Landing Gear Type:** | Tailwheel | **Seats:** | 1 |
| **Date/Type of Last Inspection:** | April 30, 1997 Annual | **Certified Max Gross Wt.:** | 4400 lbs |
| **Time Since Last Inspection:** | 20 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 3800 Hrs | **Engine Manufacturer:** | Continental |
| **ELT:** | | **Engine Model/Series:** | IO-520-D |
| **Registered Owner:** | JIMAIR, INC. | **Rated Power:** | 300 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | |
| **Operator Does Business As:** | | **Operator Designator Code:** | |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | AIT ,1205 ft msl | **Distance from Accident Site:** | 1 Nautical Miles |
| **Observation Time:** | 14:13 Local | **Direction from Accident Site:** | 160° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 360° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29 inches Hg | **Temperature/Dew Point:** | 27°C / 23°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | (AIT ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | | **Type of Clearance:** | None |
| **Departure Time:** | 14:10 Local | **Type of Airspace:** | Class E |

## Airport Information

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| **Airport:** | AITKIN AIT | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 1205 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 34 | **IFR Approach:** | None |
| **Runway Length/Width:** | 3398 ft / 75 ft | **VFR Approach/Landing:** | Forced landing |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Minor | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Minor | **Latitude, Longitude:** | 46.530647,-93.708999(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Bowling, David |
| **Additional Participating Persons:** | DAVE GERKEN; MINNEAPOLIS , MN |
| **Original Publish Date:** | December 15, 1997 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=10629 |