# Aviation Investigation Final Report

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| **Location:** | FARMINGDALE, New York | **Accident Number:** | NYC98LA108 |
| **Date & Time:** | May 15, 1998, 12:58 Local | **Registration:** | N7SB |
| **Aircraft:** | Cessna 175B | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 1 Minor, 1 None |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot reported that he made a normal, flaps-up takeoff with full throttle. The point on the runway where he became airborne was about 2,800 feet from where the initial takeoff roll began. The pilot stated he climbed out at 90 to 100 mph, and 2,400 to 2,500 rpm. He said that the rpm dropped to 2,100, and then to 1,900. The pilot then performed a forced landing to a building roof top. According to the owner's manual, the calculated takeoff distance was less than 700 feet. Certification data revealed that at 90 to 100 mph, the geared engine should have produced about 2,900 to 3,000 rpm. A carburetor icing probability chart showed that for the ambient conditions, and with less than full power, moderate icing could result. A manufacturer's service instruction stated that 'the possibility of throttle icing at wide throttle openings is very remote, so remote in fact, that it can be disregarded.'

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The engine's inability to provide full power, and the pilot's failure to use performance data. Factors in the accident were conditions conductive for carburetor icing at reduced power, and the unsuitable terrain during the forced landing.

### Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - ROLL/RUN

Findings
1. (C) POWERPLANT - OUTPUT LOW
2. (C) PERFORMANCE DATA - NOT USED - PILOT IN COMMAND
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Occurrence #2: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
3. (C) REASON FOR OCCURRENCE UNDETERMINED
4. WEATHER CONDITION - CARBURETOR ICING CONDITIONS
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Occurrence #3: FORCED LANDING
Phase of Operation: CLIMB

Findings
5. (F) TERRAIN CONDITION - NONE SUITABLE

## Factual Information

On May 15, 1998, at 1258 Eastern Daylight Time, a Cessna 175B, N7SB, was destroyed during a forced landing approximately 1 mile south of the Republic Airport, Farmingdale, New York. The certificated commercial pilot received minor injuries, and the passenger was not injured. Visual meteorological conditions prevailed at the time of the accident. No flight plan had been filed for the local flight conducted under 14 CFR Part 91.

The pilot stated that after takeoff, and passing through 150 feet, the airplane's engine rpm was 2,400 to 2,500 rpm, and then dropped to 2,100 rpm. After the rpm drop, the pilot applied carburetor heat, and "mags were cleared. Rpm further dropped to 1,900." The pilot felt he couldn't avoid a fence at the end of the airport, and there was not enough room to land straight ahead. The "decision to continue the climb was made when rpm increased back to 2,100." About 250 feet, the engine began losing power again.

The pilot stated he was "too low and too slow" to turn back to the field, and continued straight ahead. He cleared some trees, power lines, and a highway, and saw several buildings with flat roofs. Since he saw no other areas clear of obstructions, he decided to land on the largest building. At touchdown, the airplane struck an air conditioner and punctured the building's roof. It skidded off the roof into a tree, and went nose-down into a storage shed. A small fire started in the engine compartment, and was extinguished by the passenger. According to a Federal Aviation Administration (FAA) Inspector, post flight inspection revealed no water or debris during disassembly of the carburetor, and the airplane was turned over to a salvage facility.

The 1961 Cessna 175B Owner's Manual stated that normal takeoff and climb airspeeds were accomplished at full throttle. The owner's manual also stated that initial climb speed after takeoff was 84 mph, and normal climb airspeed thereafter was between 90 and 100 mph. The pilot said that he took off with full throttle and flaps up, and that he climbed between 90 and 100 mph. According to original certification data, and based on a McCauley 8464 fixed pitch propeller and full throttle, 90 mph should have resulted in a 2,990 rpm indication, and 100 mph should have resulted in a 3,070 rpm indication.

In the operational data section of the owner's manual, takeoff distance data was available for a standard day and 20 degrees flaps from a hard surface runway. There was no chart for a "flaps up" takeoff. However, according to a 1964 Cessna Aircraft Company comparative ground roll study, adding another 10% to the 20 degree flap takeoff distance would result in a reliable takeoff distance with the flaps up. The ambient temperature was 73 degrees Fahrenheit, and there was a note on the chart to increase takeoff distance by 10% for each 25 degrees Fahrenheit above standard temperature. Headwind at the time of takeoff was 10 knots, and the pilot said the airplane was about 200 pounds under maximum gross weight.

Utilizing the takeoff data chart with the above criteria, the airplane should have required less than a 700 foot ground run to take off with full power.

The pilot wrote that he began the takeoff roll at "the very beginning" of Runway 19, that the "ground run was normal, and initial liftoff occurred at approximately the intersection of Runway 14." According to airport diagrams, the intersection was about 2,800 feet from the beginning of Runway 19.

In the cruising section of the owner's manual, cruising rpm was stated as between 2,400 and 3,200 rpm. According to a carburetor icing probability chart in Tips on Winter Flying, FAA-P-8740-24, ambient conditions during the flight's timeframe would have produced "moderate icing" at cruising rpm. With reduced power, the degree of icing would have increased for the same ambient conditions.

Avco Lycoming published Service Instruction 1148B on May 4, 1973. Representatives from both Cessna and Teledyne-Continental stated that it was applicable to carbureted Continental engines, as well. The service instruction stated: "Take-offs and full throttle operation should be made with carburetor heat in the full cold position. The possibility of throttle icing at wide throttle openings is very remote, so remote in fact, that it can be disregarded."

## Pilot Information

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| **Certificate:** | Commercial; Flight instructor | **Age:** | 50,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | Airplane multi-engine; Airplane single-engine; Instrument airplane | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 2 Valid Medical--w/ waivers/lim | **Last FAA Medical Exam:** | October 2, 1997 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 1641 hours (Total, all aircraft), 600 hours (Total, this make and model), 1590 hours (Pilot In Command, all aircraft), 72 hours (Last 90 days, all aircraft), 44 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Cessna | **Registration:** | N7SB |
| **Model/Series:** | 175B 175B | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 17556947 |
| **Landing Gear Type:** | Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | December 18, 1997 Annual | **Certified Max Gross Wt.:** | 2350 lbs |
| **Time Since Last Inspection:** | 20 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 2468 Hrs | **Engine Manufacturer:** | Continental |
| **ELT:** | Installed, activated, did not aid in locating accident | **Engine Model/Series:** | GO-300 |
| **Registered Owner:** | FRITZ MARTELLY AND HENRY R REY | **Rated Power:** | 175 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | None |
| **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:** | FRG ,82 ft msl | **Distance from Accident Site:** | 2 Nautical Miles |
| **Observation Time:** | 12:45 Local | **Direction from Accident Site:** | 10° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 7 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 10 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 190° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30 inches Hg | **Temperature/Dew Point:** | 23°C / 12°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | FARMINGDALE , NY (FRG ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | | **Type of Clearance:** | None |
| **Departure Time:** | 12:50 Local | **Type of Airspace:** | Class D |

## Airport Information

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| **Airport:** | REPUBLIC FRG | **Runway Surface Type:** | |
| **Airport Elevation:** | | **Runway Surface Condition:** | |
| **Runway Used:** | 0 | **IFR Approach:** | None |
| **Runway Length/Width:** | | **VFR Approach/Landing:** | Forced landing |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Minor | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 1 None | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Minor, 1 None | **Latitude, Longitude:** | 40.729595,-73.440048(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Cox, Paul |
| **Additional Participating Persons:** | RAY B MELCER; FARMINGDALE, NY |
| **Original Publish Date:** | February 15, 2001 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=39561 |