# Aviation Investigation Final Report

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| **Location:** | Ennis, Montana | **Accident Number:** | SEA08LA043 |
| **Date & Time:** | December 5, 2007, 16:00 Local | **Registration:** | N46969 |
| **Aircraft:** | Bell UH-1B | **Aircraft Damage:** | Substantial |
| **Defining Event:** | | **Injuries:** | 1 None |
| **Flight Conducted Under:** | Part 91: General aviation - Positioning | | |

## Analysis

The pilot reported that he had flown the helicopter for five cycles throughout the day and landed at the landing zone to remove the long line. He was asked by ground personnel to reposition the helicopter from the landing zone to a nearby road in order for a snowplow to access the landing zone. Once the snowplow was done, the pilot began to reposition the helicopter back to the landing zone. As the helicopter lifted from the ground, it began to vibrate, and the vibration turned into a severe "hop or a bounce." The pilot lifted the helicopter to 15 feet; however, it continued to vibrate and subsequently began to nose over and become uncontrollable The pilot then decided to force land the helicopter and touched down hard in two feet of snow, substantially damaging the doorframe. Inspection of the helicopter revealed that the collective control absolute friction was less than the manufacturer's specified setting and the maintenance manual indicated that if the friction is not set properly, a collective bounce could be induced. No other mechanical anomalies were identified and the reason for the loss of friction could not be determined. The operator's manual indicates that the severity of this oscillation is such that effective control of the helicopter may become difficult to maintain.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of collective control friction during takeoff that resulted in a collective bounce oscillation. Contributing to the accident was the pilot's failure to maintain aircraft control during the aborted takeoff and the snow covered terrain.

## Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - ABORTED

Findings
1. (C) CONTROL FRICTION - DIMINISHED
2. (F) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #2: HARD LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. (C) TERRAIN CONDITION - SNOW COVERED

## Factual Information

On December 5, 2007, at 1600 mountain standard time, a Bell UH-1B, N46969, impacted terrain approximately 33 miles southwest of Ennis, Montana. R & R Conner Aviation LLC was operating the helicopter under the provisions of 14 Code of Federal Regulations Part 91. The pilot was not injured; the helicopter sustained substantial damage. Visual meteorological conditions prevailed and no flight plan was filed for the local positioning flight.

According to the pilot, he had flown the helicopter for five cycles throughout the day (about 1.3 to 1.5 hours per cycle) and landed at the landing zone to remove the long line. The pilot was asked by ground personnel to reposition the helicopter from the landing zone to a nearby road, in order for a snowplow to access the landing zone. Once the snowplow was finished, the pilot began to reposition the helicopter to the landing zone. As the helicopter was lifting from the ground, it began to vibrate, that turned into a severe "hop or a bounce." The pilot climbed the helicopter to about 15 feet; however, it continued to vibrate. The helicopter then began to nose over and become uncontrollable. The pilot then decided to force land the helicopter. The helicopter landed hard in two feet of snow and sustained structural damage to the doorframe.

The Federal Aviation Administration inspector stated that following the accident, the minimum collective control friction was measured at 8 pounds, and the maintenance manual specified a friction between 14 to 16 pounds. The maintenance manual noted that if the friction is not set properly, a collective bounce (vertical oscillation) could be induced. No other mechanical anomalies were identified and the reason for the loss of friction could not be determined.

According to the Operator's Manual for the UH-1B helicopter, "Collective bounce is a pilot induced vertical oscillation that may be encountered in any flight condition by a rapid buildup of vertical bounce at approximately three cycles per second. The severity of this oscillation is such that effective control of the aircraft may become difficult to maintain."

## Pilot Information

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| **Certificate:** | Commercial | **Age:** | 39,Male |
| **Airplane Rating(s):** | None | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | Helicopter | **Restraint Used:** | |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 2 Without waivers/limitations | **Last FAA Medical Exam:** | November 1, 2007 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | May 1, 2007 |
| **Flight Time:** | 1850 hours (Total, all aircraft), 1600 hours (Total, this make and model), 100 hours (Last 90 days, all aircraft), 80 hours (Last 30 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Make:** | Bell | **Registration:** | N46969 |
| **Model/Series:** | UH-1B | **Aircraft Category:** | Helicopter |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Restricted (Special) | **Serial Number:** | 63-8548 |
| **Landing Gear Type:** | Skid | **Seats:** | 2 |
| **Date/Type of Last Inspection:** | December 1, 2007 Continuous airworthiness | **Certified Max Gross Wt.:** | 8500 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 Turbo shaft |
| **Airframe Total Time:** | 16946.1 Hrs as of last inspection | **Engine Manufacturer:** | Lycoming |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | T53-13BA |
| **Registered Owner:** | R AND R Conner Aviat | **Rated Power:** | 1500 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | |

## 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:** | |
| **Observation Time:** | | **Direction from Accident Site:** | |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | | **Temperature/Dew Point:** | -5°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Ennis, MT | **Type of Flight Plan Filed:** | None |
| **Destination:** | Ennis, MT | **Type of Clearance:** | None |
| **Departure Time:** | 16:00 Local | **Type of Airspace:** | |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 None | **Latitude, Longitude:** | 44.796112,-111.624725 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Dunks, Kristi |
| **Additional Participating Persons:** | Bryan Hanson; Federal Aviation Administration; Helena, MT |
| **Original Publish Date:** | May 28, 2008 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=67231 |