



Aviation Investigation Final Report

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|--------------------------------|--------------------------------------|-------------------------|-------------|
| Location: | Caldwell, Idaho | Accident Number: | WPR17LA009 |
| Date & Time: | October 19, 2016, 09:10 Local | Registration: | N716JB |
| Aircraft: | Gray Jim Robert Exec 90 | Aircraft Damage: | Substantial |
| Defining Event: | Loss of engine power (partial) | Injuries: | 1 None |
| Flight Conducted Under: | Part 91: General aviation - Personal | | |

Analysis

Shortly after takeoff for the personal flight, about 15 to 20 ft above ground level, the experimental amateur-built helicopter suddenly yawed right, followed by a partial loss of engine power. The private pilot then performed a partial nose-up, collective-down maneuver, but due to the low altitude and not being able to maintain sufficient rotor rpm, he chose to land in soft dirt off the side of the runway; the helicopter landed hard.

The pilot had recently changed the alternator belt. A postaccident examination of the helicopter revealed that, during the maintenance, the pilot failed to properly tighten the tension bolts, which resulted in inadequate voltage to sustain ignition and the subsequent partial loss of engine power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to properly tighten the tension bolts during the installation of the alternator belt, which resulted in inadequate voltage to sustain ignition and the subsequent partial loss of engine power.

Findings

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| Aircraft | Ignition power supply - Incorrect service/maintenance |
| Personnel issues | Installation - Pilot |

Factual Information

History of Flight

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|--------------------------------|---|
| Takeoff | Loss of engine power (partial) (Defining event) |
| Landing-flare/touchdown | Hard landing |

On October 19, 2016, about 0910 mountain daylight time, an experimental amateur-built Jim Gray Rotorway Exec 90 helicopter, N716JB, was substantially damaged following a forced landing after experiencing a loss of engine power at the Caldwell Industrial Airport (EUL), Caldwell, Idaho. The private pilot and registered owner of the helicopter was not injured. Visual meteorological conditions prevailed at the time of the accident. The flight was being conducted in accordance with 14 *Code of Federal Regulations* Part 91, and a flight plan was not filed. The proposed local flight was originating at the time of the accident.

In a report submitted to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot reported that during the takeoff everything seemed normal. He then accelerated and began a slow climb. At between 15 to 20 ft above ground level and about 40 to 45 knots, the helicopter suddenly yawed right, followed by the engine losing power. The pilot stated that being so low he could not perform a normal autorotation. The pilot opined that he did a partial nose-up, collective-down maneuver, but due to the low altitude and not being able to maintain sufficient rotor rpm, he elected to land in the soft dirt off the side of the runway. A hard landing resulted in the helicopter coming to rest on its left side. The helicopter sustained substantial damage to the tail boom and horizontal stabilizer.

Subsequent to a postaccident examination of the engine, which was performed by a Federal Aviation Administration aviation safety inspector, the inspector reported to the NTSB IIC that the pilot had recently changed the alternator belt, however, had failed to properly tighten the tension bolts, which resulted in inadequate voltage to sustain ignition, thus precipitating the loss of engine power and hard landing.

Pilot Information

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| Certificate: | Private | Age: | 68, Male |
| Airplane Rating(s): | Single-engine land | Seat Occupied: | Left |
| Other Aircraft Rating(s): | Helicopter | Restraint Used: | 4-point |
| Instrument Rating(s): | None | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Class 3 With waivers/limitations | Last FAA Medical Exam: | March 30, 2016 |
| Occupational Pilot: | No | Last Flight Review or Equivalent: | September 29, 2015 |
| Flight Time: | 577 hours (Total, all aircraft), 403 hours (Total, this make and model), 422 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 0.2 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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|--------------------------------------|--|---------------------------------------|-----------------|
| Aircraft Make: | Gray Jim Robert | Registration: | N716JB |
| Model/Series: | Exec 90 | Aircraft Category: | Helicopter |
| Year of Manufacture: | 1998 | Amateur Built: | Yes |
| Airworthiness Certificate: | Experimental (Special) | Serial Number: | Exec-3000 |
| Landing Gear Type: | Skid | Seats: | 2 |
| Date/Type of Last Inspection: | February 28, 2016 Continuous airworthiness | Certified Max Gross Wt.: | 1500 lbs |
| Time Since Last Inspection: | 223 Hrs | Engines: | 1 Reciprocating |
| Airframe Total Time: | 223 Hrs at time of accident | Engine Manufacturer: | Rotorway |
| ELT: | Not installed | Engine Model/Series: | 55005 |
| Registered Owner: | On file | Rated Power: | 152 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: | EUL,2432 ft msl | Distance from Accident Site: | |
| Observation Time: | 08:56 Local | Direction from Accident Site: | |
| Lowest Cloud Condition: | Clear | Visibility | 8 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 4 knots / | Turbulence Type Forecast/Actual: | / None |
| Wind Direction: | 40° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 30.02 inches Hg | Temperature/Dew Point: | 3°C / 2°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Caldwell, ID (EUL) | Type of Flight Plan Filed: | None |
| Destination: | Caldwell, ID (EUL) | Type of Clearance: | None |
| Departure Time: | 09:00 Local | Type of Airspace: | Class G |

Airport Information

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|-----------------------------|-------------------------|----------------------------------|----------------|
| Airport: | Caldwell Industrial EUL | Runway Surface Type: | Asphalt |
| Airport Elevation: | 2432 ft msl | Runway Surface Condition: | Dry |
| Runway Used: | 12 | IFR Approach: | None |
| Runway Length/Width: | 5500 ft / 100 ft | VFR Approach/Landing: | Forced landing |

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: | 43.641944,-116.635833(est) |

Administrative Information

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| Investigator In Charge (IIC): | Little, Thomas |
| Additional Participating Persons: | Craig Karel; Federal Aviation Administration; Boise, ID Rudy Rossi; Federal Aviation Administration; Boise, ID |
| Original Publish Date: | March 5, 2018 |
| Last Revision Date: | |
| Investigation Class: | Class |
| Note: | The NTSB did not travel to the scene of this accident. |
| Investigation Docket: | https://data.ntsb.gov/Docket?ProjectID=94240 |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).