Aviation Investigation Final Report

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

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

Factual Information

History of Flight

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

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

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

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

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

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

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