



National Transportation Safety Board Aviation Accident Final Report

Location:	Kailua-Kona, HI	Accident Number:	WPR12LA195
Date & Time:	05/02/2012, 1700 HST	Registration:	N209KR
Aircraft:	ROBINSON R22	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 Serious, 1 None
Flight Conducted Under:	Part 91: General Aviation - Instructional		

Analysis

While the student pilot was maneuvering for a practice off-field landing, the flight instructor observed that it was starting to drizzle, so he instructed the student to apply carburetor heat, which he did. As the student was continuing to maneuver for the approach to landing, the instructor detected a loss of engine power. The flight instructor immediately took control of the helicopter, rolled the throttle off and on to recover the loss of rotor rpm, and subsequently instructed the student to try to restart the engine while he set up an emergency landing. The student attempted three engine restarts, each of which was unsuccessful. The flight instructor then performed an emergency autorotation to upsloping terrain, which resulted in a hard landing and substantial damage to the helicopter. The instructor stated that the engine was running at idle after the landing. A postaccident examination of the engine and a subsequent engine run revealed no operational difficulties that would have precluded normal operation. The reason for the loss of engine power could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power while maneuvering for reasons that could not be determined because postaccident examination of the engine did not reveal any anomalies that would have precluded normal operation.

Findings

Environmental issues	Sloped/uneven terrain - Not specified
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

On May 2, 2012, about 1700 Hawaii standard time, N209KR, a Robinson R22 Beta helicopter, was substantially damaged during a hard landing following a reported partial loss of engine power near Kailua-Kona, Hawaii. The helicopter was registered to Mauna Loa Helicopters of Kailua-Kona, Hawaii. The certified flight instructor and student pilot were not injured. Visual meteorological conditions prevailed at the time of the accident. The instructional flight was being operated in accordance with 14 Code of Federal Regulations Part 91, and no flight plan was filed. The flight departed the Kona International Airport (HKO), Kailua-Kona, Hawaii about 1630.

In a report submitted to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the certified flight instructor (CFI) reported that after departing on the training flight the student climbed upslope to about 2,000 feet mean sea level (msl) to practice off-airport landings. The CFI stated that after locating a suitable landing area the student began orbiting the spot with a slow descent to about 1,500 feet msl. As it started to sprinkle the CFI instructed the student to pull carb heat [to the ON position]. The instructor reported that about half way through the approach, which was 300 feet above ground level (agl), he heard mechanical sounds similar to a poorly running engine, which was followed by a loss of lift and rotor rpm. The CFI revealed that after he took control of the helicopter he lowered the collective and rolled on throttle. When rotor rpm did not recover he initiated a full autorotation and applied aft cyclic to prevent stalling the main rotor. The instructor further revealed that as he was rolling the throttle on and off, he did not detect a change in engine rpm, and assumed that the engine had quit. The instructor stated that during the autorotation he instructed the student to attempt to restart the engine. He then made an 80-degree turn upslope to clear some trees, and before landing he reported that he heard the starter turning over as he rolled the throttle on and off. During the landing approach while clearing a set of trees the CFI reported that he did not have sufficient airspeed for the landing flare to be successful, and consequently the helicopter landed hard upslope. The instructor stated that after landing he realized that the engine was running at idle, adding that he thought the engine had started on the third restart attempt by the student.

In a statement submitted to the NTSB IIC, the student pilot reported that about 200 to 300 feet agl and at a normal rate of descent with carburetor heat full up in the ON position, the engine started to lose power; the first indication of this was an unusual noise. The student further reported that at this time the instructor took control of the helicopter and instructed him to start the engine. The student added that as the CFI manipulated the throttle to restore power, he was trying to start the engine, which he reported was three times without success. The student also reported that the low rotor rpm horn had activated, and that at about 20 to 30 feet agl, with the collective in the full up position, is when aircraft control was lost. The student stated that after the helicopter had landed the low rotor horn [remained on], the main rotor blades were still turning, and that he heard the sound of the engine.

A postaccident examination of the helicopter was overseen by representatives from the NTSB and the Federal Aviation Administration (FAA). The engine inspection was performed while it remained attached to the helicopter, subsequent to being recovered to the operator's maintenance facility located at HKO. The inspection revealed that the spark plugs were in good condition, with the exception of the #4 cylinder bottom plug, which showed a small sign of lead deposits; the #4 top plug revealed evidence of a small amount of carbon deposit. All spark

plugs were tested and observed to emit spark. Additionally, each ignition lead fired, and both magnetos were functional with no anomalies noted. The engine's valve train was determined to be intact, with no indication of push rod deformation. Both intake and exhaust valves were observed to open and close properly, with no anomalies noted. A check of the compression of each cylinder was confirmed. An examination of the carburetor's venturi revealed no contamination. The air induction filter revealed impact damage but no signs of contamination. The carburetor heat control cable was intact. A fuel sample was obtained from the gascolator, with no evidence of contamination noted. The engine was subsequently started and run for about one minute with no anomalies noted. The engine was operated only at idle power, due to its precarious position as attached to the airframe. The reason for the reported partial loss of engine power was undetermined.

At 1653, the weather reporting facility at the HKO reported wind 180 degrees at 10 knots, visibility 10 miles, overcast clouds at 6,000 feet, temperature 27 degrees Celsius (C), dew point 16 degrees C, and an altimeter setting of 29.95 inches of mercury.

A carburetor icing probability chart revealed that at the ambient temperature and dew point at the time of the accident favored serious carburetor icing at glide power.

History of Flight

Maneuvering	Simulated/training event
Autorotation	Loss of engine power (partial) (Defining event) Off-field or emergency landing
Landing-flare/touchdown	Hard landing

Flight Instructor Information

Certificate:	Flight Instructor; Commercial	Age:	27, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter; Instrument Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last Medical Exam:	11/01/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	11/01/2011
Flight Time:	400 hours (Total, all aircraft), 303 hours (Total, this make and model), 351 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Student Pilot Information

Certificate:	Student	Age:	26, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Unknown	Last Medical Exam:	11/02/2011
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	72 hours (Total, all aircraft), 72 hours (Total, this make and model), 20 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	ROBINSON	Registration:	N209KR
Model/Series:	R22 BETA	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	2218
Landing Gear Type:	Skid	Seats:	2
Date/Type of Last Inspection:	04/05/2012, 100 Hour	Certified Max Gross Wt.:	1370 lbs
Time Since Last Inspection:	79 Hours	Engines:	1 Reciprocating
Airframe Total Time:	8379 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-360
Registered Owner:	Hawaii Pacific Aviation Inc.	Rated Power:	180 hp
Operator:	Hawaii Pacific Aviation Inc.	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	HKO, 30 ft msl	Observation Time:	1653 HST
Distance from Accident Site:	10 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	200°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Unknown	Temperature/Dew Point:	27° C / 16° C
Lowest Ceiling:	Overcast / 6000 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:	10 knots, 180°	Visibility (RVR):	
Altimeter Setting:	29.95 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	Light - Showers - Drizzle; No Obscuration		
Departure Point:	Kailua-Kona, HI (HKO)	Type of Flight Plan Filed:	None
Destination:	Kailua-Kona, HI (HKO)	Type of Clearance:	None
Departure Time:	1630 HST	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 None		

Administrative Information

Investigator In Charge (IIC):	Thomas Little	Adopted Date:	05/09/2013
Additional Participating Persons:	Merritt Wilson; Federal Aviation Administration; Honolulu, HI		
Publish Date:	05/09/2013		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=83560		

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