



National Transportation Safety Board Aviation Accident Final Report

Location:	Mesa, AZ	Accident Number:	WPR13LA099
Date & Time:	01/22/2013, 1400 MST	Registration:	N143PG
Aircraft:	GOETZ HELICYCLE	Aircraft Damage:	Substantial
Defining Event:	Hard landing	Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot reported that while in cruise flight, the helicopter's engine lost partial power. Because the helicopter was unable to maintain altitude, the pilot performed an autorotation to a residential street, and the helicopter landed hard. A witness reported that before the helicopter landed, it was oscillating and sounded as if the engine was cutting in and out. Postaccident examination of the helicopter revealed that the "B" wire, which runs between the electronic speed controller unit and the fuel controller actuator motor, had separated. The pilot further reported that he had installed the "B" wire without strain relief at the connector, which allowed the wire to disconnect from the fuel control system because of vibrations during normal flight operations. The pilot reported that this disconnection resulted in a loss of fuel controller actuator motor power, and the engine power decreased to flight idle.

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 install and secure the wire connecting the electronic speed controller unit to the fuel controller actuator motor, which resulted in the wire's disconnection in flight and the resultant partial loss of engine power.

Findings

Aircraft	Engine fuel and control - Malfunction (Cause) Misc wiring - Incorrect service/maintenance (Cause)
Personnel issues	Installation - Pilot (Cause)

Factual Information

On January 22, 2013, about 1400 mountain standard time, a Goetz Helicycle, N143PG, experienced a hard landing following an off airport autorotation about 4 miles southeast of Falcon Field Airport (FFZ), Mesa, Arizona. The commercial pilot, the sole occupant, was not injured. The helicycle was registered to, and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed, and no flight plan had been filed for the flight that originated from Chandler Municipal Airport (CHD), Chandler, Arizona.

The pilot reported that he had hovered the helicycle for about 15 minutes prior to a normal takeoff. During the flight, the engine suddenly lost partial power. The pilot initiated an emergency landing onto a residential road. A witness reported that his attention was first drawn to the helicycle when he heard an engine cutting in and out. Once the helicycle came into view, he noticed that it was also oscillating. The helicycle made a circle over his neighborhood before it initiated an autorotation to the ground. The helicycle landed hard and came to rest in a bush. During the accident sequence, the tailboom and tail rotor assembly were substantially damaged.

Post-accident examination of the airframe and engine by a Federal Aviation Administration Inspector revealed that the fuel controller actuator motor arm was in the minimum fuel position. The electronic speed controller unit was damaged and separated from the helicycle. Several of the wires from this system were pulled from their ring terminals, including the "B" wire, which runs to the fuel controller actuator motor. All of these wires showed signs of being mechanically pulled from the ring terminal with the exception of the "B" wire, which did not have the same rough and tension markings.

The pilot reported that the "B" wire had come loose at the connection while inflight. He further reported that when there is a loss of power to the fuel controller actuator motor the engine automatically goes to a minimum fuel stop position and flight idle. The pilot further reported that there were no parts failures, but that he had installed the "B" wire without an additional strain relief at the connector, which allowed the wire to disconnect from the system during normal operations.

The pilot reported that the accident can be prevented by installing a second parallel wire between the fuel controller actuator motor and the electronic speed controller unit.

History of Flight

Prior to flight	Aircraft maintenance event
Enroute-cruise	Loss of engine power (partial)
Approach	Off-field or emergency landing
Autorotation	Hard landing (Defining event)

Pilot Information

Certificate:	Commercial	Age:	65
Airplane Rating(s):	Multi-engine Sea; Single-engine Land; Single-engine Sea	Seat Occupied:	Single
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	12/01/2011
Occupational Pilot:	No	Last Flight Review or Equivalent:	01/14/2012
Flight Time:	1500 hours (Total, all aircraft), 370 hours (Total, this make and model), 1400 hours (Pilot In Command, all aircraft), 18 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GOETZ	Registration:	N143PG
Model/Series:	HELICYCLE	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	3-27
Landing Gear Type:	Skid;	Seats:	1
Date/Type of Last Inspection:	03/15/2012, Condition	Certified Max Gross Wt.:	850 lbs
Time Since Last Inspection:		Engines:	1 Turbo Shaft
Airframe Total Time:	371 Hours at time of accident	Engine Manufacturer:	Solar
ELT:	Not installed	Engine Model/Series:	T62-32
Registered Owner:	GOETZ JOE	Rated Power:	
Operator:	GOETZ JOE	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	FFZ, 1394 ft msl	Distance from Accident Site:	4 Nautical Miles
Observation Time:	1405 MST	Direction from Accident Site:	56°
Lowest Cloud Condition:	Clear	Visibility	40 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	340°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30.08 inches Hg	Temperature/Dew Point:	25° C / 8° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Chandler, AZ (CHD)	Type of Flight Plan Filed:	None
Destination:	Mesa, AZ (FFZ)	Type of Clearance:	None
Departure Time:	1345 MST	Type of Airspace:	Class E

Airport Information

Airport:	Falcon Field Airport (FFZ)	Runway Surface Type:	Asphalt; Concrete
Airport Elevation:	1394 ft	Runway Surface Condition:	Dry
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	33.456389, -111.723611 (est)

Administrative Information

Investigator In Charge (IIC):	Samantha A Link	Report Date:	01/13/2014
Additional Participating Persons:	Jack T Ogle; Federal Aviation Administration; Scottsdale, AZ		
Publish Date:	01/13/2014		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=86062		

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