Aviation Investigation Final Report

Location:	Oshkosh, Wisconsin	**Accident Number:**	CEN16LA294
Date & Time:	July 30, 2016, 15:05 Local	**Registration:**	N975BH
Aircraft:	Bell 47G 2	**Aircraft Damage:**	Substantial
Defining Event:	Powerplant sys/comp malf/fail	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The airline transport pilot maneuvered the helicopter on the downwind leg of the airport traffic pattern and attempted to reduce power for landing; however, the engine power remained excessively high. The pilot attempted to further reduce the engine power by turning off one magneto and applying carburetor heat, but the power remained too high to safely descend. The pilot then entered a sideslip, which allowed the helicopter to descend to about 100 ft above the runway. He turned the engine power off and autorotated to the ground. The helicopter landed hard in a tail-low attitude. The main rotor struck the tail and the tail rotor assembly separated from the helicopter.

A postaccident examination found that the throttle linkage nut had loosened and separated from its fitting, causing the throttle to remain open. The helicopter's maintenance manual did not specify a torque value for the throttle linkage nut, and there were no maintenance procedures requiring the nut to be loosened or removed during overhaul. The pilot indicated that a complete overhaul of the helicopter was completed about 37 hours before the accident flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The loosening and separation of the throttle linkage nut, which resulted in a loss of throttle control and subsequent hard landing after autorotation.

Findings

Aircraft	Power lever - Inoperative

Factual Information

History of Flight

Approach-VFR pattern downwind	Powerplant sys/comp malf/fail (Defining event)
Autorotation	Engine shutdown
Autorotation	Hard landing

On July 30, 2016, about 1500 central daylight time (CDT), a Bell 47 G2, N975BH, experienced a loss of engine power control during descent into Whittman Regional Airport (KOSH), Oshkosh, Wisconsin. The helicopter sustained substantial damage to the main rotor blades and tail. The airline transport-rated pilot and two passengers on-board were not injured. The helicopter was privately registered and operated by the Experimental Aircraft Association (EAA) under the provisions of 14 Code of Federal Regulations Part 136 as a commercial air tour flight. Visual meteorological conditions prevailed for the flight, and no flight plan was filed. The local flight originated at Pioneer Airport (WS17), Oshkosh, Wisconsin.

The pilot explained that tour flights departed from Pioneer Airport (WS17), part of the Oshkosh Airport Complex, and flew over the EAA AirVenture Fly-In grounds then returned to the airport. Upon return to the airport, the pilot entered the downwind leg of the pattern and attempted to reduce power for landing. The power would only decrease to 3100rpm. The throttle was moved 'full travel' with no power change. The pilot explained that he wanted to maintain the collective to avoid over speeding the engine, but was unable to slow or descend. He switched to the right magneto and applied full carburetor heat to reduce the engine power; however, the power did not reduce enough to descend. After flying the traffic pattern "several times" attempting to descend, the pilot described putting the helicopter into a slip with the right pedal. He stated it was the only way to descend because when the pedals were in a neutral position the helicopter would climb with the engine still producing full power. He circled at the end of runway 9 to descend in altitude, getting to approximately 100 feet agl before shutting off the ignition and conducting a low altitude auto rotation. The helicopter impacted the ground "hard" on the back side of the skids, the main rotor blade struck the tail and the tail rotor assembly separated from the tail boom. The helicopter skidded to the left side of the runway and came to rest in the grass.

The pilot stated there were no indications of a flight control problem in prior flights the day of the accident, or during the accident flight until returning to the airport at the completion of the tour.

The pilot indicated a complete overhaul of the helicopter was completed 37.6 hours before the accident flight. An on-scene inspection of the helicopter by the FAA and NTSB personnel revealed the throttle linkage nut had loosened and separated from its fitting, this separation would result in complete loss of throttle control. The maintenance manual for the Bell 47 G-2 did not specify a torque value for this nut given there were no maintenance procedures requiring the nut to be loosened or removed.

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer	**Age:**	56,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	July 5, 2016
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 18, 2016
Flight Time:	25000 hours (Total, all aircraft), 970 hours (Total, this make and model), 11000 hours (Pilot In Command, all aircraft), 32 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	Female
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	Female
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N975BH
Model/Series:	47G 2	**Aircraft Category:**	Helicopter
Year of Manufacture:	1959	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2242
Landing Gear Type:	N/A; Skid	**Seats:**	3
Date/Type of Last Inspection:	June 23, 2015 Annual	**Certified Max Gross Wt.:**	2450 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	6866.1 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	VO-435
Registered Owner:	MATTHEW L ANDERSON	**Rated Power:**	260 Horsepower
Operator:	Experimental Aircraft Association	**Operating Certificate(s) Held:**	Commercial air tour (136)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KOSH,782 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:		**Direction from Accident Site:**	165°
Lowest Cloud Condition:		**Visibility**	
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:			
Departure Point:	Oshkosh, WI (OSH)	**Type of Flight Plan Filed:**	None
Destination:	Oshkosh, WI (OSH)	**Type of Clearance:**	VFR
Departure Time:		**Type of Airspace:**	Class D

Airport Information

Airport:	WITTMAN RGNL OSH	**Runway Surface Type:**	Concrete
Airport Elevation:	808 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	09	**IFR Approach:**	None
Runway Length/Width:	6179 ft / 150 ft	**VFR Approach/Landing:**	Forced landing;Straight-in;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	43.99139,-88.559722(est)

Administrative Information

Investigator In Charge (IIC):	Liedler, Courtney
Additional Participating Persons:	Peter Corrao; FAA; Milwaukee, WI
Original Publish Date:	July 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=93717