



Aviation Investigation Final Report

Location:	Butler, Missouri	Accident Number:	CEN15LA396
Date & Time:	August 21, 2015, 11:00 Local	Registration:	UNREG
Aircraft:	Burns Mini 500	Aircraft Damage:	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot had just departed the airport in the unregistered, amateur-built helicopter. While in the traffic pattern, the helicopter shuddered and made a noise the pilot described as sounding like a tire blowing out on a car. He performed an autorotation to a soybean field and leveled the helicopter at 5 ft above the ground (2 ft above the crop), although he stated that he believed that the helicopter's tail rotor may have been in the crop, which caused instability. When the rotor speed bled off, the helicopter settled onto its right skid and rolled over. Postaccident examination did not reveal any preimpact anomalies, but a complete examination was not performed. Although the pilot believed that the one-way clutch, part of the power transmission system of the helicopter, had failed, which would have resulted in a loss of power to the rotor system, he had not disassembled the transmission to verify this. Additionally, the pilot's improper flare during the autorotation resulted in a premature loss of rotor speed, and the subsequent rollover.

Probable Cause and Findings

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

The pilot's failure to attain a proper landing flare following an autorotation for reasons that could not be determined based on available information.

Findings

Aircraft	Engine/transmission coupling - Failure
Aircraft	Landing flare - Not attained/maintained

Factual Information

History of Flight

Enroute-cruise	Sys/Comp malf/fail (non-power) (Defining event)
Autorotation	Miscellaneous/other

On August 21, 2015, about 1100 central daylight time, an unregistered amateur-built Mini 500 helicopter, received substantial damage during a forced landing near Butler, Missouri, following a reported mechanical failure while in cruise flight. The pilot was not injured. During the mishap, the helicopter rolled onto its right side resulting in separation of the tail boom, and one of the main rotor blades. The aircraft was not registered to and was operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The flight originated from the Butler Memorial Airport (BUM), Butler, Missouri, about 1050.

The pilot reported that he departed from runway 18 at BUM and remained in the traffic pattern. He said that on his second circuit he turned west from the downwind leg of the traffic pattern, crossed the runway and then turned north (right downwind for runway 18). He said that he was straight and level and the helicopter was operating normally when it suddenly shuddered and made a noise he described as sounding like a tire blowing out on a car. He performed an autorotation to a soybean field. He said that he leveled the helicopter about 5 feet above the ground, and about 2 feet above the soybean crop. He stated that he believed that the tail rotor contacted the crop causing some instability. The rotor speed bled off and the helicopter settled onto its right skid and rolled onto its side.

Postaccident examination of the helicopter failed to reveal any preimpact anomalies, however, complete examination of the power transmission system was not possible. In a telephone conversation with the pilot, he stated that when he initially experienced the problem, he thought the power transmission belts had failed, but upon examination after the accident he found they were still intact. When asked what he believed happened, he surmised that the one-way clutch that is part of the power transmission system had failed. He said that he had not taken anything apart on the helicopter and he did not think that he would.

Pilot Information

Certificate:	Private	Age:	59, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Single
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	July 22, 2008
Occupational Pilot:	No	Last Flight Review or Equivalent:	September 15, 2013
Flight Time:	300 hours (Total, all aircraft), 30 hours (Total, this make and model), 300 hours (Pilot In Command, all aircraft), 30 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Burns	Registration:	UNREG
Model/Series:	Mini 500	Aircraft Category:	Helicopter
Year of Manufacture:	2015	Amateur Built:	Yes
Airworthiness Certificate:	None	Serial Number:	001
Landing Gear Type:	Skid	Seats:	1
Date/Type of Last Inspection:	Condition	Certified Max Gross Wt.:	840 lbs
Time Since Last Inspection:	30 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	30 Hrs at time of accident	Engine Manufacturer:	Rotax
ELT:	Not installed	Engine Model/Series:	582UL
Registered Owner:	On file	Rated Power:	80 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:	GLY	Distance from Accident Site:	31 Nautical Miles
Observation Time:	15:55 Local	Direction from Accident Site:	90°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	160°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	25°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Butler, MO (BUM)	Type of Flight Plan Filed:	None
Destination:	Butler, MO (BUM)	Type of Clearance:	None
Departure Time:	10:50 Local	Type of Airspace:	Class G

Airport Information

Airport:	BUTLER MEMORIAL BUM	Runway Surface Type:	Asphalt
Airport Elevation:	893 ft msl	Runway Surface Condition:	Vegetation
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	3999 ft / 75 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:	38.289722,-94.340278

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Rod McLaughlin; FAA - Kansas City FSDO; Kansas City , KS
Original Publish Date:	November 28, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=91902

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