Aviation Investigation Final Report

Location:	HICKORY, North Carolina	**Accident Number:**	MIA99LA017
Date & Time:	October 26, 1998, 15:15 Local	**Registration:**	N500GQ
Aircraft:	Reinhold REVOLUTION MINI 500	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot stated the engine lost power without warning while in cruise flight between 500-700 feet. An autorotaion was made to a clear area with high vegetation. During touchdown on the previously unnoticed uneven terrain, the main rotor hit the mechanical stop and contacted the tailboom. The helicopter then spun around 180 degrees and came to rest. Postcrash examination of the engine showed the rear cylinder had seized in the barrel. The pilot stated this was the second time this had happened. The engine had accumulated 46 hours since being rebuilt after the previous failure.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The seizure of the rear piston in the cylinder barrel resulting in total loss of engine power and an autorotation which resulted in main rotor contact with the tail boom while touching down on unsuitable terrain.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE - NORMAL

Findings
1. (C) ENGINE ASSEMBLY,PISTON - SEIZED

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
2. AUTOROTATION - PERFORMED - PILOT IN COMMAND

Occurrence #3: MISCELLANEOUS/OTHER
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. TERRAIN CONDITION - NONE SUITABLE
4. TERRAIN CONDITION - HIGH VEGETATION
5. MISC ROTORCRAFT,MAIN ROTOR/TAIL BOOM CONTACT

Factual Information

On October 26, 1998, about 1515 eastern standard time, a Reinhold Revolution Mini 500, N500GQ, registered to an individual, crashed while making a forced landing following loss of engine power near Hickory, North Carolina, while on a Title 14 CFR Part 91 personal flight. Visual meteorological conditions prevailed at the time and no flight plan was filed. The helicopter received substantial damage and the airline transport-rated pilot was not injured. The flight originated from Hickory, North Carolina, the same day, about 1600.

The pilot stated that while in cruise flight at between 500-700 feet, the engine quit with no prior warning. He initiated an autorotation and made a left turn toward a clearing. Upon touchdown on uneven terrain, the main rotor hit the mechanical stop and then contacted the tailboom. The helicopter spun around to the left 180 degrees and came to rest on the back skids and engine muffler. The clear area he selected for the landing was overgrown with about 6 feet of vegetation.

Postcrash examination of the engine by the pilot showed the rear piston had seized in the barrel. The pilot stated to NTSB that this was the second time this has happened in this helicopter. The engine had accumulated about 46 flight hours since it was rebuilt after the previous piston seizure.

Pilot Information

Certificate:	Airline transport; Flight engineer; Flight instructor	**Age:**	39,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Center
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	May 19, 1998
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	11600 hours (Total, all aircraft), 69 hours (Total, this make and model), 4000 hours (Pilot In Command, all aircraft), 210 hours (Last 90 days, all aircraft), 70 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Reinhold	**Registration:**	N500GQ
Model/Series:	REVOLUTION MINI 500 REVOLUTION	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	404
Landing Gear Type:	Skid	**Seats:**	1
Date/Type of Last Inspection:	March 15, 1998 Annual	**Certified Max Gross Wt.:**	840 lbs
Time Since Last Inspection:	38 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	69 Hrs	**Engine Manufacturer:**	Rotax
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	582
Registered Owner:	GRAUER REINHOLD	**Rated Power:**	67 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HKY ,1189 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	24°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WEDDINGTON , NC	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	13:45 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**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:**	35.770591,-81.329452(est)

Administrative Information

Investigator In Charge (IIC):	Kennedy, Jeffrey
Additional Participating Persons:	RALPH S CARR; CHARLOTTE , NC
Original Publish Date:	August 27, 1999
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=45171

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