Aviation Investigation Final Report

Location:	Argyle, New York	**Accident Number:**	ATL07CA084
Date & Time:	May 21, 2007, 18:00 Local	**Registration:**	N636PB
Aircraft:	Rotorway Rotorway INTL 162F	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The certified flight instructor (CFI) stated that the purpose of the flight was instruction. He conducted a preflight of the helicopter and did not note any problems with the helicopter. Start up and run up was completed by the checklist with no problems. They lifted off, hovered for a few minutes and landed again. Shortly thereafter they departed an airport for training. The takeoff and climb were normal, and they leveled off at 1,500 feet. Approximately 3 miles from the airport, the engine began to run rough and there was a drop in power. The dual student transferred the flight controls to the CFI. The CFI decided not to continue the flight to the airport, and initiated an approach to a field behind a house. On approach the engine stopped, and an autorotation was initiated to the field. The touchdown was "smooth" and level, with a slow forward speed. The helicopter slid approximately 10 feet and rolled over onto the left side. Examination of the helicopter by an FAA inspector revealed no flight control anomalies. The pilot reported that the helicopter was fine until the engine power began decrease. The examination of the engine revealed that the number 4 rocker arm was unsecured and the spring retainer was damaged. Further examination revealed that the number 4 exhaust valve had stuck in the open position. In a review of the logbook it was discovered that the mechanic had made valve lash adjustments to all the cylinders on September 16, 2006, at an engine tachometer time of 17.4 hours. The engine tachometer time at the accident site was 18.1 hours. The engine had .7 hours before the exhaust valve failed. The cylinder heads were sent to Rotorway International for examination of the exhaust and intake valves. According to Rotorway, examination of the heads revealed that the exhaust valves were found to be "sticky in their guides". The guide size measured at the low side of the tolerance before cleaning. After cleaning with a wire brush, the fit of the valves in the cylinder heads and the tolerance of sizes were acceptable.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of engine power due to the sticking of the exhaust valves that resulted from carbon buildup.

Findings

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

Findings
1. (C) ENGINE ASSEMBLY,VALVE,EXHAUST - CONTAMINATION
2. (C) ENGINE ASSEMBLY,VALVE,EXHAUST - MOVEMENT RESTRICTED

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

Occurrence #3: ROLL OVER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
3. TERRAIN CONDITION - SOFT

Factual Information

The certified flight instructor (CFI) stated that the purpose of the flight was instruction. He conducted a preflight of the helicopter and did not note any problems with the helicopter. Start up and run up was completed by the checklist with no problems. They lifted off at 1745, hovered for a few minutes and landed again. Shortly thereafter they departed to the Argyle Airport (NY02), Argyle, New York, for training. The take off and climb were normal, and they leveled off at 1,500 feet. Approximately 3 miles from NY02 the engine began to run rough and there was a drop in power. The dual student transferred the flight controls to the CFI. The CFI decided not to continue the flight to NY02 and initiated an approach to a field behind a house. On approach the engine stopped, and an autorotation was initiated to the field. The touchdown was "smooth" and level, with a slow forward speed. The helicopter slid approximately 10 feet and rolled over onto the left side.

Examination of the helicopter by an FAA inspector revealed no flight control anomalies. The left skid sank into soft soil before rolling onto the left side. The pilot reported that the helicopter was fine until the engine power began decrease. The examination of the engine revealed that the number 4 rocker arm was unsecured and the spring retainer was damaged. Further examination revealed that the number 4 exhaust valve had stuck in the open position. In a review of the logbook it was discovered that the mechanic had made valve lash adjustments to all the cylinders on September 16, 2006, at an engine tachometer time of 17.4 hours. The engine tachometer time at the accident site was 18.1 hours. The engine had .7 hours before the exhaust valve failed.

The cylinder heads were sent to Rotorway International for examination of the exhaust and intake valves. According to the director of R&D, examination of the heads revealed that the exhaust valves were found to be "sticky in their guides". The guide size measured at the low side of the tolerance before cleaning. After cleaning with a wire brush, the fit of the valves in the cylinder heads and the tolerance of sizes were acceptable.

Flight instructor Information

Certificate:	Airline transport	**Age:**	54,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 1, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	18000 hours (Total, all aircraft), 17 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Rotorway	**Registration:**	N636PB
Model/Series:	Rotorway INTL 162F	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	6636
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	May 1, 2007 Condition	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	0.6 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	17 Hrs at time of accident	**Engine Manufacturer:**	Rotorway
ELT:	Installed, not activated	**Engine Model/Series:**	150W
Registered Owner:	Paul Breton	**Rated Power:**	150 Horsepower
Operator:	Paul Breton	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KGFL,328 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	17:15 Local	**Direction from Accident Site:**	280°
Lowest Cloud Condition:	Thin Overcast / 4100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 3100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	330°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	8°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Private strip, NY	**Type of Flight Plan Filed:**	None
Destination:	ARGYLE, NY (NY02)	**Type of Clearance:**	None
Departure Time:	17:45 Local	**Type of Airspace:**	

Airport Information

Airport:	ARGYLE NY02	**Runway Surface Type:**	
Airport Elevation:	330 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	43.252498,-73.469169

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Albany FSDO-01
Original Publish Date:	October 31, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65834