



Aviation Investigation Final Report

Location:	LAKWOOD, New Jersey	Accident Number:	NYC99FA078
Date & Time:	March 20, 1999, 14:30 Local	Registration:	UNREG
Aircraft:	DELEEUW SPRINT 1000	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation		

Analysis

The unregistered homebuilt airplane experienced an engine failure, then began a left turn, which evolved into a cartwheel prior to impact. The engine's normal exhaust gas temperature range was 930 degrees to 1,150 degrees Fahrenheit, while the maximum temperature was 1,200 degrees Fahrenheit. The passenger remembered seeing a digital readout, as it passed through the number 1,168. Engine teardown revealed scuffing on the magneto piston, in the vicinity of the exhaust port, on the upper half of the piston skirt. Within the scuffing, carbon deposits were observed. Scuffing and carbon fill were also found at the 4 o'clock and 7 o'clock positions, relative to the exhaust port, also on the upper half of the piston skirt. The piston rings and cylinder walls exhibited scuffing as well, which positionally corresponded to the scuffing on the cylinder skirt.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's loss of control, which resulted in an unintentional stall/spin after an engine failure. A factor in the accident was the engine failure, which occurred when the magneto piston seized within the cylinder sleeve during an overtemp event.

Findings

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

Findings

1. (F) POWERPLANT - FAILURE, TOTAL
2. ENGINE ASSEMBLY, PISTON - SEIZED
3. MISCELLANEOUS, ENGINE - OVERTEMPERATURE

Factual Information

HISTORY OF FLIGHT

On March 20, 1999, about 1430 Eastern Standard Time, a homebuilt, unregistered Sprint 1000 airplane was destroyed during a forced landing in Lakewood, New Jersey. The certificated private pilot was fatally injured, and the passenger received serious injuries. Visual meteorological conditions prevailed at the time of the accident. No flight plan was filed for the local flight, which originated from the Jackson Ultralight Center, Jackson, New Jersey. The flight was conducted under 14 CFR Part 91.

According to the passenger, he had approached the pilot a few days earlier at the ultralight center to set up a familiarization ride. He had read a number of articles about the pilot over the previous years, and felt he would be the best person to fly with. The pilot showed the passenger a number of videos about ultralight flying, and gave him a tour of the facilities. The pilot also showed the passenger the ultralight to be used for the familiarization flight, but the passenger said he wanted to fly in something "more substantial." The pilot showed him the Sprint 1000, and said he'd have to get permission from the owner to fly the passenger in it. Permission was granted, and the flight was scheduled. On the morning of the accident, the passenger called the pilot. The pilot informed the passenger that he decided not to fly at that time because of the high winds. He told the passenger to come over to the ultralight center later, when the wind conditions were expected to improve.

The passenger arrived at the ultralight center between 1300 and 1330. As he was pulling into the parking lot, the owner of the airplane and the pilot also arrived. The pilot looked toward the windsock, said he thought it would be all right to fly, and then asked for, and received permission again from the owner to use the airplane. The passenger was outfitted, and the owner started the airplane's motor. The motor then stopped. The motor was restarted, but no one said anything as to why it stopped.

Before climbing onboard, the passenger asked the pilot: "You sure this isn't dangerous?" To which, the pilot answered: "What do you think I want to do, lose a student?" At this point in the interview, the passenger stated that he wanted to make it clear that he was not a "student" on the accident flight.

The passenger stated that no emergency procedures were discussed, and that the only way he got information was by asking what to do if something happened to the pilot. The pilot explained the control functions, and then they got into the airplane, with the pilot in the left seat and the passenger in the right seat. The pilot told the passenger to hold on to the wing struts during the takeoff, and not to touch any of the controls, which the passenger said he complied with during the entire flight.

The airplane began to taxi toward the runway, and on the way, the pilot checked the dual ignition switches. The airplane kept moving, reversed direction, and began the takeoff roll at full power. As the speed increased, the passenger felt gusts of wind. Once airborne, the airplane climbed straight ahead, then began a right turn. It felt like a gust of wind turned the airplane to the right, and other gusts were forcing the airplane up and down. Then, while still in the right turn, the engine stopped. The passenger asked the pilot: "Did you do that on purpose?" When the pilot did not answer, the passenger again asked the question, to which the pilot responded: "No." The pilot didn't say another word, nor did he make any attempt to restart the engine. The passenger felt the airplane go out of control, and afterwards, only remembered looking forward, at the ground, before the impact.

Just prior to the engine failure, the passenger noticed a digital gauge with readouts of 1,163, then 1,167, and finally, 1,168.

The owner of the airplane stated that he had performed a preflight on it about a half hour before the flight. He said he took fuel samples, and drained about a cup of fuel from each of the two tanks. He found no water, dirt, or debris. He started the engine while the passenger was present, and then shut it down to save fuel. He started it up again when the pilot was ready to depart. He saw the airplane back-taxi, then take off downwind. It took longer than normal, and required "the whole field to climb out." He heard no strange noises; the engine sounded "throaty," and not abnormal from what he had heard during previous flights. He watched the airplane until it started a right turn, and then disappeared behind trees.

A witness was parked in a car at the back side of a golf course, north of, and facing the ultralight center. He was accustomed to the ultralight activity, and helped remove an ultralight that had landed on the golf course previously. He watched the airplane from just after the takeoff, until just before impact. After the takeoff, the airplane headed over the golf course, then began a right turn. The airplane was still climbing out, and was an estimated 60 to 70 feet over 40-foot trees, when the engine stopped. The airplane appeared to glide for 2 to 4 seconds, then began a gradual left turn. The turn then increased sharply, and the airplane appeared to half-cartwheel. The left wing remained down until the witness lost sight of the airplane behind trees.

The accident occurred during daylight hours, in the vicinity of 40 degrees, 03.72 minutes north, and 74 degrees, 15.02 minutes west.

PERSONNEL INFORMATION

According to the pilot's son, the pilot's logbook could not be located. Through other sources, it was revealed that the pilot held an advanced flight instructor qualification for ultralight aircraft, from the United States Ultralight Association, Inc. (USUA). For airplanes, the pilot held an Federal Aviation Administration (FAA) private pilot certificate with single-engine land, single-engine sea, and multi-engine land ratings. On his latest third class medical certificate

application, dated April 4, 1997, the pilot stated that he had 6,500 hours of flight time.

In 1998, the pilot received USUA's highest recognition, the John J. Moody Award, for having made significant contributions to the sport. In December of that year, he was quoted as saying: "You're in control of your safety. You're as safe as your skill and training. Your engine could stop, but it means nothing. You can easily glide down to a safe landing if you have the skills."

According to the pilot's son, the pilot would take off downwind at times in order to be over less hostile terrain, should an emergency occur.

AIRCRAFT INFORMATION

The airplane had a Rotax 582-series engine. According to the technical data provided in the operator's manual, the normal exhaust gas temperature range was 930 to 1,150 degrees Fahrenheit, and the maximum exhaust gas temperature was 1,200 degrees Fahrenheit.

The engine's light alloy cylinders had cast iron sleeves, and a consistent bore diameter from top to bottom. The aluminum pistons were tapered at the top, and were ground slightly more in the area of the exhaust port. The piston rings were pinned so they could not revolve.

The engine operator's manual stated: "It is recommended to use full throttle during take-off climb. Slight throttle reduction may create a leaner mixture and should be avoided."

It further stated:

"During cruise and descending, it is very important not to create a lean condition with high rpm and low throttle opening. The less fresh charge the engine gets, the more hot residual gas remains in the cylinder. This raises the temperature to a critical level."

The owner stated that he and several other people had put the airplane together under the direction of the pilot. He also stated that he had flown with the pilot about five or six times, and that the pilot had never demonstrated a glide with the engine shut down. During takeoffs and climbs with the accident pilot onboard, the owner said he always used full power, and remembered that the exhaust gas temperature would rise to about 1,150 degrees Fahrenheit during the climb.

The owner also said that there were no logbooks or maintenance books, but estimated that the airplane had no more than 20 hours of flight time. After the accident, the Engine Information System (EIS) was sent to its manufacturer, and hour meter indicated 51.4 hours of operation. However, the airplane's owner stated that the EIS had originally been installed on another engine. He also stated that the gear oil had been changed at 10 hours, and to his knowledge, the engine had never had an unintentional stoppage.

The owner stated that he paid for the airplane and considered it his. He put it together, with some help from others, under the guidance of the pilot. He noted that that were some difficulties in putting the airplane together because the manuals were incomplete.

The purchase arrangement for the kit involved the fact that the pilot wanted to become an authorized dealer of the kits. Since he had to sell three kits to become a dealer, he told the owner he could pay for it "at cost," but the pilot would then also be able to use it in his business.

In a later letter to the Safety Board, the owner stated that he was not, in fact, the owner. However, in a subsequent conversation with the pilot's son, the same individual sought compensation from him for the loss of the airplane.

METEROLOGICAL INFORMATION

Winds recorded about 25 minutes after the accident, at an airport 10 nautical miles northeast, were from 330 degrees magnetic, at 10 knots. Witnesses stated that there were wind gusts in the area at the time of the accident.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located about 1/2 mile northeast of the ultralight center. It was about 15 feet below the crest of a grass-covered hill, on about a 10-degree slope. Primary ground scars were oriented up-slope, in a direction of approximately 330 degrees magnetic. The farthest end of the main ground scar turned left about 90 degrees, and pointed towards the wreckage, about 10 feet away.

The airplane was found resting on the wings' trailing edges, and the tail was found tucked under the seating area, which in turn, was oriented such that the foot rests were sticking up into the air. One of the three propeller blades was fractured. All flight surfaces were found at the scene. The left wing exhibited leading edge crushing about 7 feet from the centerline, outward. The nose wheel was heavily caked in dirt. One of the supporting struts was broken, while the other, which was still attached to the wheel, was bent upward and to the right. The fuel and EIS switches were on, the ignition switch was on "both," and the throttle was full in. Both fuel tanks were partially filled, and the coolant reservoir was also partially filled, with coolant that was reddish-orange in color.

Further inspection of the wreckage revealed that the left forward strut-to-wing screw attachment had four threads showing, and the left rear strut-to-wing attachment had nine threads showing. The right forward strut-to-wing attachment had one-half of a thread showing, while the right rear strut-to-wing attachment had four threads showing. During the inspection, the manufacturer of the kit stated that the attachment screw threads should have been set up equally.

During engine examination, the propeller turned freely, and throttle continuity was confirmed. The carburetor adjustments were within manufacturer's limits, the spark plug tips appeared black in color, and among a number of fuel samples, only one small drop of water was found. A 5 psi pressure was applied to the crankcase, and had a drop of 1/2 psi in 3 minutes. A vacuum pressure was also applied to the crankcase, and showed no change in 3 minutes. The air filter was clean. The pneumatic line between the crankcase and the impulse fuel pump was not clamped. The line was pumped up to 5 psi. It lost 1/2 psi per minute going into the crankcase fitting, and experienced no loss going into the impulse pump fitting. The impulse fuel pump and the electric fuel pump were in series. There was a 1/8 inch-diameter flake of debris in magneto piston carburetor float bowl. Engine static timing was checked, and was at the manufacturer's optimum settings.

The power take-off (PTO) piston had carbon deposits on the piston face, and exhibited no damage to either the rings or the skirt. The cylinder walls did not exhibit any damage.

The magneto piston also had carbon deposits on its face, but exhibited scuffing in the vicinity of the exhaust port, on the upper half of the piston skirt. Within the scuffing, carbon deposits were observed. Scuffing and carbon fill were also found at the 4 o'clock and 7 o'clock positions, relative to the exhaust port, also on the upper half of the piston skirt. The piston rings and cylinder walls exhibited scuffing, which positionally corresponded to the scuffing found on the cylinder skirt.

The cylinder and piston assemblies were forwarded to the Safety Board Materials Laboratory for further examination. The examination confirmed scuffing and carbon deposit locations, as well as the fact that the pistons were within engine manual tolerances.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot's remains at the Kimball Medical Center, Lakewood, New Jersey. Toxicological testing was performed by the State of New Jersey, State Toxicology Laboratory, Newark, New Jersey, and was negative for the volatiles, drugs and other compounds tested.

ADDITIONAL INFORMATION

Under 14 CFR Part 103, an ultralight aircraft, if powered, "is used or intended to be used in the air by a single occupant," and "has a fuel capacity not to exceed 5 U.S. gallons." Under Federal Aviation Administration (FAA) Exemption 4274, which was granted to the United States Ultralight Association (USUA), Inc., dual flight instruction was permitted in aircraft with a maximum fuel capacity of not more than 10 U.S. gallons. The accident airplane had a fuel capacity of about 16 U.S. gallons.

According to the passenger, the pilot told him that the airplane was not legal for ultralight flight, but that the extra fuel capacity would enhance safety.

The Rotax engine operator manual stated:

"Danger! This engine, by its design, is subject to sudden stoppage! Engine stoppage can result in crash landings. Such crash landings can lead to serious bodily injury or death. Never fly the aircraft equipped with this engine at locations, airspeeds, altitudes, or other circumstances from which a successful no-power landing cannot be made, after sudden engine stoppage."

The manual further stated:

"Warning! This is not a certificated aircraft engine. It has not received any safety or durability testing, and conforms to no aircraft standards. It is for use in experimental, uncertificated aircraft and vehicles only in which an engine failure will not compromise safety. User assumes all risk of use, and acknowledges by his use that he knows this engine is subject to sudden stoppage."

On March 20, 1999, the wreckage was released to a representative from the Lakewood Police Department, Lakewood, New Jersey.

Pilot Information

Certificate:	Private	Age:	75, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical-w/ waivers/lim	Last FAA Medical Exam:	April 18, 1997
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	6500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	DELEEUW	Registration:	UNREG
Model/Series:	SPRINT 1000 SPRINT 100	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:		Serial Number:	
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	1000 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	20 Hrs	Engine Manufacturer:	Rotax
ELT:	Not installed	Engine Model/Series:	582
Registered Owner:	DOUGLAS DELEEUW	Rated Power:	64 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:	BLM ,160 ft msl	Distance from Accident Site:	10 Nautical Miles
Observation Time:	14:55 Local	Direction from Accident Site:	50°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	330°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	9°C / -10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	, NJ (NONE)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	14:30 Local	Type of Airspace:	Class G

Airport Information

Airport:		Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:	0	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal, 1 Serious	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC): Cox, Paul

Additional Participating Persons: GREG MCDONOUGH; TRENTON , NJ
RONALD L SMITH; LUCEDALE , MS
ERIC TUCKER; VERNON

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Last Revision Date:

Investigation Class: [Class](#)

Note:

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=46009>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).