National Transportation Safety Board
Aviation Accident Final Report

Location:	Sebastian, FL	**Accident Number:**	ERA14LA279
Date & Time:	06/02/2014, 1700 EDT	**Registration:**	N360VT
Aircraft:	FREDERICK HAYS-ROTH VELOCITY TWIN	**Aircraft Damage:**	Substantial
Defining Event:	Hard landing	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot/owner reported that he accompanied the chief pilot of the airplane kit manufacturer on operational ground and flight tests of the airplane following the installation of a rebuilt left propeller. The tests were "normal," and the chief pilot deplaned. The pilot then serviced the airplane with fuel and departed to perform three solo takeoffs and landings. On the third takeoff, the airplane pulled left and required hard right rudder to maintain runway alignment. When the airplane was about traffic pattern altitude, the pilot noted a 1,200-rpm difference between the left and right engines; the left engine was producing 1,400 rpm, and the right engine was producing 2,600 rpm. While flying the remainder of the traffic pattern, the pilot attempted to troubleshoot and get the rpm on the two engines to match until he was on final approach to the runway. The pilot reduced the engine power to idle as the airplane crossed the runway threshold, and the airplane "floated awhile" before touching down and subsequently bouncing again. The pilot stated that, during the second touchdown, the left wing lifted "due to the crosswind from the left" and that he had inadequate speed to control the airplane. The pilot chose to abort the landing after the second bounce when the airplane was at a 45-degree, nose-high attitude. Both engines accelerated to full power, but the airplane collided with the runway, and both main landing gear and propellers were separated. Examination of the propeller assembly revealed no preimpact mechanical anomalies, and all noted damage was consistent with impact and overstress.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper landing flare, which resulted in a bounced landing. Also causal to the accident were the pilot's subsequent delayed decision to abort the landing and his improper execution of the aborted landing, which resulted in the airplane exceeding its critical angle-of-attack and experiencing an aerodynamic stall.

Findings

Aircraft	
	Propeller system - Not specified
	Angle of attack - Not attained/maintained (Cause)
Personnel issues	Decision making/judgment - Pilot (Cause)
	Aircraft control - Pilot (Cause)
	Incorrect action performance - Pilot (Cause)

Factual Information

HISTORY OF FLIGHT

On June 2, 2014, about 1700 eastern daylight time, an experimental amateur-built Velocity Twin, N360VT, was substantially damaged when it collided with the runway and terrain following a loss of control while landing at Sebastian Municipal Airport (X26), Sebastian, Florida. The private pilot/owner was not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight, which was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

In a written statement, the pilot stated that he accompanied the chief pilot for the airplane kit manufacturer in his airplane for an "operational test" following the installation of an overhauled propeller on the number 1 (left) engine. The ground and flight tests were "normal" and the chief pilot deplaned before the pilot refueled the airplane and departed by himself to perform three takeoffs and landings.

On the third takeoff, the pilot said the airplane "pulled" to the left and required "hard" right rudder to maintain runway alignment. About traffic pattern altitude, the pilot noted a 1,200 rpm difference between the left and right engines; with the left engine producing 1,400 rpm and the right engine producing 2,600 rpm. Throughout the remainder of the traffic pattern, the pilot attempted to troubleshoot and match the rpm on the two engines until he was on final approach to runway 10.

The pilot reduced engine power to idle as he crossed the runway threshold, and the airplane "floated awhile" before touching down, and bouncing back into the air. During the second touchdown, the left wing lifted "due to the crosswind from the left" and the pilot stated that he had inadequate speed to control the airplane. He elected to abort the landing and advanced both throttles; but the airplane yawed to the right, departed the runway, and collided with terrain.

In a telephone interview with a Federal Aviation Administration inspector, the pilot stated that upon landing "the wind caught him," which resulted in a couple of "bumps" down the runway.

In both a written statement and a telephone interview, a witness described an "unstable" approach before the airplane contacted the runway and "launched" back into the air. He described the right wing and the landing gear striking the ground twice before the airplane bounced back into the air. He said, "At this point he had a 40-45 degree nose-up attitude. He went to full power, but he was already stalled. The airplane struck the ground out of control and the landing gear and both propellers separated from the airplane."

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane multiengine, single engine, and instrument airplane. His most recent FAA third class medical certificate was issued on May 14, 2013. He reported 1,500 total hours of flight experience, of which 17 hours were in the accident airplane make and model.

According to the chief pilot of Velocity Aircraft, the airplane transition syllabus time for the Velocity Twin was 5.0 hours. The pilot required 11.5 hours of training prior to his first solo flight in the airplane. On his first solo flight, the cargo door was left open, and a bungee cord and other loose cargo departed the airplane and passed through the arc of the right propeller,

which destroyed the blades and required a complete rebuild of the right propeller system.

AIRCRAFT INFORMATION

According to FAA records, the airplane was manufactured in 2014. According to company records, its most recent conditional inspection was completed February 7, 2014. The airplane had accrued about 55 total hours of operation at the time of the accident.

The rebuilt propeller was returned and installed on the airplane June 2, 2014. The chief pilot performed the ground and operational flight testing on the right propeller, and right propeller governor, and the pilot/owner accompanied him during the test. In his statement, the chief pilot described in detail the manner in which he conducted the tests and monitored the propeller's performance on the ground, and at takeoff, climb, and cruise power settings. He stated that the performance of the propeller and governor was "normal."

METEOROLOGICAL INFORMATION

At 0954, the weather conditions reported at Vero Beach, Florida (VRB), 11 miles southeast of the accident airport, included a broken ceiling at 3,600 feet, visibility 10 miles, temperature 26 degrees C, dewpoint 19 degrees C, and an altimeter setting of 30.09 inches of mercury. The wind was from 080 degrees at 12 knots. According to the chief pilot, the Automated Surface Observing System (ASOS) at X26 reported winds from 100 degrees at 15 knots gusting to 19 knots just before the accident flight.

WRECKAGE INFORMATION

The wreckage was recovered from the accident site and moved into the aircraft kit manufacturer's facility where it was examined by an FAA inspector on June 3, 2014. The canard supporting structure, wings, and fuel tank areas appeared undamaged. There was damage to the wing tips, ailerons, landing gear, fuselage around the left main gear cutout, fuselage aft of the left main gear, lower fuselage access panel, the left side of the empennage, canard, and both propellers. There was a section of a wooden propeller blade stuck in the damaged area of the empennage.

The blades of the left propeller could be rotated independently in the propeller hub with hand pressure. Several of the leading edge strips that were recovered showed damage consistent with impact with the landing gear leg. The right propeller blades were secure in the hub.

Continuity and rigging of the propeller controls was confirmed.

TESTS AND RESEARCH

The left propeller assembly was removed, and examined at the manufacturer's facility in Deland, Florida on July 16, 2014 under the supervision of the FAA inspector. Each of the three blades was fractured at its root.

Disassembly of the propeller assembly revealed the piston extension displayed three index marks or impressions consistent with blade pin contact. The pitch change blocks were fractured. According to the inspector's report, "The number one blade was removed and the piston extension (with serviceable pitch change blocks) was reinstalled without the return springs so the movement of the pitch change blocks could be observed when the blade was rotated. It was noted that the pitch change blocks moved less than 1/16th of an inch with the full travel of the blade from low pitch to feather. It was not obvious ... what caused the broken pitch change blocks."

Photographs of the pitch change blocks were reviewed by an NTSB Senior Materials Investigator who stated the fractures were consistent with overload failure.

ADDITIONAL INFORMATION

The Airplane Flying Handbook (FAA-H-8083-3), Chapter 14, "Transition to a Multiengine Airplane" stated, "The complexity of multiengine airplanes makes a knowledge of and proficiency in emergency go-around procedures particularly essential for safe piloting. The emergency go-around during a landing approach is inherently critical because it is usually initiated at a very low altitude and airspeed with the airplane's configuration and trim adjustments set for landing. Unless absolutely necessary, the decision to go around should not be delayed to the point where the airplane is ready to touch down. The more altitude and time available to apply power, establish a climb, retrim, and set up a go-around configuration, the easier and safer the maneuver becomes."

History of Flight

Approach-VFR pattern downwind	Unknown or undetermined
Landing-flare/touchdown	Hard landing (Defining event)

Pilot Information

Certificate:	Private	**Age:**	66
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without Waivers/Limitations	**Last Medical Exam:**	05/14/2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1470 hours (Total, all aircraft), 15 hours (Total, this make and model), 18 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	FREDERICK HAYS-ROTH	**Registration:**	N360VT
Model/Series:	VELOCITY TWIN	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental	**Serial Number:**	VT004
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	02/07/2014, Conditional	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	55 Hours	**Engines:**	Reciprocating
Airframe Total Time:	55 Hours	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-320
Registered Owner:	BAY AREA AIR LLC	**Rated Power:**	160 hp
Operator:	BAY AREA AIR LLC	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	VRB, 23 ft msl	**Observation Time:**	1653 EDT
Distance from Accident Site:	11 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	120°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:		**Temperature/Dew Point:**	26°C / 19°C
Lowest Ceiling:	Overcast / 3600 ft agl	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	12 knots/ 15 knots, 80°	**Visibility (RVR):**	
Altimeter Setting:	30.09 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Precipitation		
Departure Point:	Sebastian, FL (X26)	**Type of Flight Plan Filed:**	None
Destination:	Sebastian, FL (X26)	**Type of Clearance:**	None
Departure Time:	1630 EDT	**Type of Airspace:**	

Airport Information

Airport:	SEBASTIAN MUNI (X26)	**Runway Surface Type:**	Asphalt
Airport Elevation:	21 ft	**Runway Surface Condition:**	Dry
Runway Used:	10	**IFR Approach:**	None
Runway Length/Width:	3199 ft / 75 ft	**VFR Approach/Landing:**	Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None		

Administrative Information

Investigator In Charge (IIC):	Brian C Rayner	**Adopted Date:**	06/22/2015
Additional Participating Persons:	Thomas Gross; FAA/FSDO; Orlando, FL		
Publish Date:	06/22/2015		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=89358		