National Transportation Safety Board
Aviation Accident Final Report

Location:	Longmont, CO	**Accident Number:**	CEN12LA655
Date & Time:	09/01/2012, 1130 MDT	**Registration:**	N898N
Aircraft:	TL ULTRALIGHT SRO STINGSPORT	**Aircraft Damage:**	Substantial
Defining Event:	Powerplant sys/comp malf/fail	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

While conducting maneuvers at 2,500 feet, the airplane began to vibrate violently. The pilot aborted the maneuver and retarded the throttle to idle; the engine experienced a total loss of power. The pilot executed a forced landing into a field. After the landing, the pilot and the designated pilot examiner noticed that two of the propeller blades had separated from the propeller hub. An examination of the fractured blades and blade sleeves revealed that blade A likely fractured due to progressive cracking at laminate bonds at the interface between the wood blade and the metal sleeve. The powdery wood observed in the slots and at the root end of the blade shank were indicative of rubbing wood as the cracks progressed. The blade B fracture was likely secondary and occurred due to the vibrations associated with the imbalance created by the blade A fracture and subsequent separation. The propeller log indicated that manufacturer-specified visual inspections and torque checks were not conducted at the specified interval of 150 hours but at intervals of about 203, 320, and 250 hours. The delayed visual inspections reduced the likelihood of detecting the cracks and the delayed torque checks might have contributed to crack growth in the blade.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the wood propeller blades in flight. Contributing to the accident was the owner/operator's failure to complete required inspections on the propeller within the specified interval, which reduced the likelihood of detecting the cracks and may have contributed to the crack growth.

Findings

Aircraft	Propeller blade section - Failure (Cause)
	Propeller blade section - Fatigue/wear/corrosion (Factor)
	Propeller blade section - Inadequate inspection (Factor)
Personnel issues	Scheduled/routine inspection - Pilot (Factor)

Factual Information

HISTORY OF FLIGHT

On September 1, 2012, about 1130 mountain daylight time, a TL Ultralight SRO Stingsport airplane, N898N, conducted a forced landing after two of the propeller blades separated inflight near Longmont, Colorado. The airplane sustained substantial damage. The sport pilot and the designated pilot examiner (DPE) on board were not injured. The aircraft was registered to STING4FUN LLC and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as an instructional flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The flight originated from Erie Municipal Airport (KEIK), Erie, Colorado at 1100.

The DPE stated that while the pilot was conducting a steep turn demonstration at 2,500 feet above the ground, the engine began vibrating violently. The pilot aborted the maneuver and retarded the throttle to idle when the engine experienced a total loss of power. The pilot made an emergency landing in a nearby field. After the landing, the pilot and DPE noticed that two of the three propeller blades had separated from the propeller hub. The airplane sustained substantial damage to the firewall and engine mount.

PERSONNEL INFORMATION

The pilot, age 43, held a sport pilot certificate at the time of the accident. He received his private pilot certificate after the conclusion of the accident flight.

AIRCRAFT INFORMATION

The airplane was a TL Ultralight SRO Stingsport, two-place, high wing, fixed gear, light sport airplane manufactured in 2006. An airworthiness certificate was issued for N889N on March 10, 2006. It was powered by a Bombardier Rotax engine and equipped with a 3 bladed WoodComp wooden propeller.

Visual inspections of the propeller and propeller hub and bolt torques were checked per the TL Ultralight SRO and WoodComp instructions. The inspections were completed on: August 1, 2009 at a total time of 158.4; August 3, 2009 at a total time of 361.2; August 12, 2010 at a total time of 680.9; and September 1, 2011 at a total time of 924.8.

According to WoodComp, the propeller inspections were required at 150 hour intervals.

METEOROLOGICAL INFORMATION

An automated weather report at Erie, Colorado, 14 miles north of the accident site, was issued at 1134 and reported: wind from 020 degrees and 3 knots, 10 miles visibility, sky clear, temperature 29 degrees Celsius (C), dewpoint 3 degrees C, and pressure 30.12 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest upright in a field. The engine mounts and firewall were bent during the forced landing. The rest of the airplane was otherwise unremarkable.

TESTS AND RESEARCH

The remaining propeller blade and all three propeller sleeves were examined by the NTSB Materials Laboratory, Washington, DC. Each of the propeller blades and corresponding blades sleeves were labeled A, B, and C for identification purposes.

Blade A consisted of an entire blade sleeve and a small amount of fractured wood inside the sleeve. A tan powdery substance was noted in the sleeve and in the slots of the sleeve. The substance was tested and matched that of the wood propeller. Progressive cracks were evident in blade A between the blade and the metal sleeve.

Blade B consisted of an entire blade sleeve and a section of wood which remained attached to the sleeve and also extended out of the sleeve. The blade exhibited cracks in the wood that corresponded to the interface between the blade and the sleeve.

Blade C consisted of an entire blade sleeve and an entire wood blade and exhibited kinked fibers in the composite layer and crack features at the blade root near the metal sleeve.

History of Flight

Maneuvering	Powerplant sys/comp malf/fail (Defining event)

Pilot Information

Certificate:	Private	**Age:**	43
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without Waivers/Limitations	**Last Medical Exam:**	12/06/2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Check Pilot Information

Certificate:	Airline Transport; Flight Instructor	**Age:**	
Airplane Rating(s):	Single-engine Land; Single-engine Sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Single-engine	**Toxicology Performed:**	
Medical Certification:		**Last Medical Exam:**	
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	TL ULTRALIGHT SRO	**Registration:**	N898N
Model/Series:	STINGSPORT	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Special Light-Sport	**Serial Number:**	TLUSA129
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Rotax
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	STING4FUN LLC	**Rated Power:**	
Operator:	STING4FUN LLC	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KEIK	**Observation Time:**	1134 MDT
Distance from Accident Site:	14 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	200°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	29°C / 3°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	3 knots, 20°	**Visibility (RVR):**	
Altimeter Setting:	30.12 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	ERIE, CO (EIK)	**Type of Flight Plan Filed:**	None
Destination:	ERIE, CO (EIK)	**Type of Clearance:**	None
Departure Time:	MDT	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None		

Administrative Information

Investigator In Charge (IIC):	Michael J Folkerts	**Adopted Date:**	04/10/2014
Additional Participating Persons:	Terry Rhea; Federal Aviation Administration; Denver, CO		
Publish Date:	04/10/2014		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=85136		