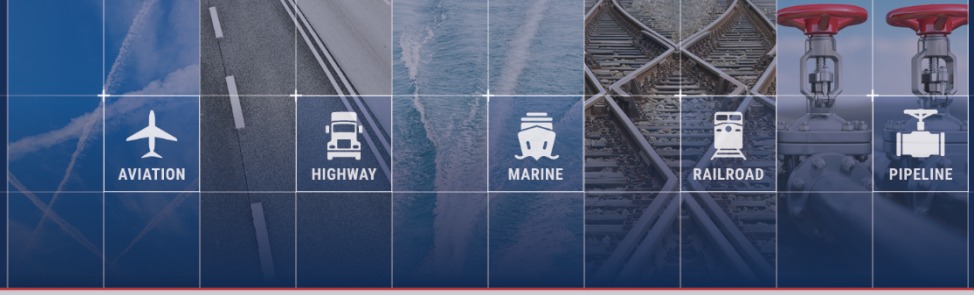

Aviation Investigation Final Report

Location:	Helena, Montana	**Accident Number:**	WPR14LA238
Date & Time:	June 7, 2014, 09:30 Local	**Registration:**	N472WM
Aircraft:	SKYKITS CORP SAVANNAH VGW	**Aircraft Damage:**	Substantial
Defining Event:	Aircraft structural failure	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot of the experimental, light sport aircraft reported that he was conducting touch-and-go landings and takeoffs at his private, turf-covered airstrip. During the seventh landing, the nosewheel folded back, the shaft dug into the ground, and the airplane nosed over, which resulted in substantial damage to the fuselage, wings, and vertical stabilizer. Two of the four 1/4-inch-diameter bolts holding the nosewheel fork to the shaft were found sheared. The bolts appeared to have sheared under tension, indicating that an overload failure had occurred. The pilot reported no preaccident mechanical anomalies with the airplane that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The overload failure of the nosewheel fork retaining bolts during landing, which resulted in a nose-over.

Findings

Aircraft	Nose/tail landing gear - Failure

Factual Information

History of Flight

Landing-landing roll	Aircraft structural failure (Defining event)
Landing-landing roll	Nose over/nose down

On June 7, 2014, about 0930 Mountain daylight time, a Skykit Savannah VGW, experimental light sport (E-LSA) airplane, N472WM, sustained substantial damage during landing at a private airstrip near Helena, Montana. The airplane was owned and being operated by the pilot as a visual flight rules, personal local flight, under 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and the solo pilot was not injured. The airplane departed the private airstrip for the local area flight, about 0800.

The pilot reported that he had built the experimental light sport category airplane, and had flown it about 15 hours. He was doing touch and go landings and takeoffs at his private, turf covered, airstrip. During the seventh landing, the bolts holding the nose wheel fork to the shaft sheared, the nose wheel folded back, the shaft dug into the ground, and the airplane nosed over. The pilot said the airstrip was not rough and the landing was not hard. The airplane sustained substantial damage to the fuselage, wings, and vertical stabilizer. Prior to the accident no mechanical anomalies were reported.

The pilot said that during the building process he contacted the manufacturer and expressed his concern that the one-quarter inch diameter bolts used in the nose wheel assembly were too weak for the assembly. He said that experimental light sport regulations do not afford the builder the opportunity to substitute hardware.

The airplane was not examined by the National Transportation Safety Board investigator. The owner/builder forwarded close-up photographs of the damage and the sheered bolts to the investigator. The owner/builder reported that the two facing 1/4 inch bolts on the wheel yoke connection appeared to have failed under tension. Documentation of the damage provided by the owner/builder is contained in the public docket for this investigation. Additionally the owner/builder provided his synopsis of the failure, as-well-as documentation of his preaccident conversations with the manufacturer, which are also contained in the public docket.

Certification Information

The accident airplane was certified as an Experimental Light Sport (E-LSA) airplane under ASTM 2279-10. The American Society for Testing and Materials (ASTM), is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services. ASTM 2245-13b is the current specification, accepted by the FAA that covers airworthiness requirements for the design of powered fixed wing light sport aircraft. In order to comply with flight requirements, the following shall be evaluated: load distribution limit, propeller speed and pitch limit, stalling speed, takeoff, climb, landing, balked landing, controllability

and maneuverability, vibrations, and ground control and stability. For compliance of structure requirements, the following shall be considered: flight loads; control surface and system loads; horizontal stabilizing and balancing surfaces (balancing loads, maneuvering loads, and gust loads); vertical stabilizing surfaces (maneuvering loads, gust loads, and outboard fins or winglets); supplementary conditions for stabilizing surfaces; ailerons, wing flaps, and special devices; ground load conditions; water load conditions; emergency landing conditions; and other loads. The aircraft shall be designed with the following minimum instrumentation and equipment: flight and navigation instruments such as airspeed indicator, and altimeter; engine instruments such as fuel quantity indicator, tachometer (RPM), and miscellaneous equipment such as master switch, and overload protection device; and safety belts and harnesses. Each airplane shall include a Pilot Operating Handbook (POH).

This is a brief summary of the referenced standard. It is informational only and not an official part of the standard; the full text of the standard itself must be referred to for its use and application.

The scope of the specification covers airworthiness requirements for the design of powered fixed wing light sport aircraft, an "airplane."

The specification is applicable to the design of a light sport aircraft/airplane as defined by regulations and limited to VFR flight.

The standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.

In the United States, several distinct groups of aircraft may be flown as light-sport. Existing certificated aircraft and experimental, amateur-built aircraft that fall within the definition listed in 14 Code of Federal Regulations are acceptable, as are aircraft built to an industry consensus standard rather than FAA airworthiness requirements. The accepted consensus standard is defined by ASTM Technical Committee F37. Aircraft built to the consensus standard may be factory-built and sold with a special airworthiness certification (S-LSA) or may be assembled from a kit under the experimental rules (E-LSA) under experimental airworthiness. A company must have produced and certified at least one S-LSA in order to be permitted to sell E-LSA kits of the same model. E-LSA kits are not subject to the normal experimental amateur built (E-AB) requirement 14 Code of Federal Regulations Part 21.191 which identifies an aircraft, the "major portion of which has been fabricated and assembled by persons who undertook the construction project solely for their own education or recreation."

Unlike aircraft built under the Experimental Amateur Built (E-AB) category, owners/builders of E-LSA aircraft are not permitted to substitute materials and hardware. They must assemble/build the aircraft as directed by the E-LSA manufacturer with the parts provided by the manufacturer. Substitution of materials must be approved by the manufacturer, and documented as approved substitutions.

Pilot Information

Certificate:	Commercial	**Age:**	80
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Sport pilot	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	275 hours (Total, all aircraft), 23 hours (Total, this make and model), 213 hours (Pilot In Command, all aircraft), 11 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	SKYKITS CORP	**Registration:**	N472WM
Model/Series:	SAVANNAH VGW NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	2011	**Amateur Built:**	
Airworthiness Certificate:	Experimental light sport (Special)	**Serial Number:**	10-02-51-904
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	October 23, 2013 Condition	**Certified Max Gross Wt.:**	1235 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	15 Hrs at time of accident	**Engine Manufacturer:**	Rotax
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	912ULS
Registered Owner:	MAYKUTH GERALD S	**Rated Power:**	100 Horsepower
Operator:	MAYKUTH GERALD S	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Helena, MT (MT40)	**Type of Flight Plan Filed:**	None
Destination:	Helena, MT (MT40)	**Type of Clearance:**	None
Departure Time:	08:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Silver Creek Airport 40MT	**Runway Surface Type:**	Grass/turf
Airport Elevation:	3860 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	1460 ft / 250 ft	**VFR Approach/Landing:**	Touch and go;Traffic pattern

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:**	46.703334,-112.068336

Administrative Information

Investigator In Charge (IIC):	Lewis, Lawrence
Additional Participating Persons:	Bryan Hanson; FAA FSDO; Helena, MT
Original Publish Date:	January 12, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89396