Aviation Investigation Final Report

Location:	Lava Hot Spring, Idaho	**Accident Number:**	LAX07LA278
Date & Time:	September 14, 2007, 10:30 Local	**Registration:**	N769R
Aircraft:	Skykits Savannah ADV	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot had been recently certified as a light sport airplane instructor and wanted to become more proficient with crosswind landings from the right seat. The first takeoff and landing were normal. On the second landing, the pilot noted a moderate, variable crosswind, along with turbulent conditions. He maintained an airspeed of about 5 knots faster for taking off and landing. The pilot stated that as he flared for landing, the airplane floated down the runway as a result of "ground level turbulence." The nose unexpectedly dropped and struck the ground. The nose landing gear collapsed and the airplane nosed over, which caused structural damage to the fuselage. The pilot further reported that he had trimmed the airplane with a "significant nose-high attitude." However, based on manufacturer's illustration of the positions of the pivot plate and hinge point, the airplane had in fact been trimmed to a full nose-down position. A Safety Board metallurgist examined the elevator trim aft control rod and reported that the downward bending deformation at the fracture location was consistent with an overstress fracture under compression loading and no mechanical or design anomalies were noted.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Failure of the pilot to maintain aircraft control during landing.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. WEATHER CONDITION - CROSSWIND
2. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Occurrence #3: NOSE OVER
Phase of Operation: LANDING

Findings
3. TERRAIN CONDITION - RUNWAY

Factual Information

HISTORY OF FLIGHT

On September 14, 2007, at 1030 mountain daylight time, a special light sport airplane (S-LSA) Skykits Savannah ADV airplane, N769R, came to rest inverted after landing at Lava Hot Springs Airport (00E), Lava Hot Springs, Idaho. The pilot/owner operated the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The airplane sustained substantial damage. The private pilot and one passenger (a safety pilot) were not injured. Visual meteorological conditions prevailed for the local area flight that departed about 1012. No flight plan had been filed.

In a written report, the pilot stated that he had recently obtained certification as a light sport instructor. He reported that the purpose of the flight was to become proficient with crosswind landings while flying in the right front seat. He reported that there were no toe brakes installed on the right side of the airplane, so a safety pilot seated in the left seat would assist with braking. The first takeoff and landing occurred without incident. The pilot noted that there was a moderate, variable crosswind with bumpy conditions, so he was landing and taking off at a speed about 5 knots faster than he would have if there were calm wind conditions. During the flare for the second landing, there was ground level turbulence, and the airplane floated. The pilot stated that the nose of the airplane unexpectedly dipped and the nose gear hit the ground and collapsed. The nose of the airplane contacted the ground and the airplane nosed over, resulting in structural damage to the fuselage.

The pilot and a Federal Aviation Administration (FAA) investigator inspected the airplane and noted a broken trim control rod in the horizontal stabilizer.

The pilot stated that the airplane is to be trimmed with "a significant nose-high attitude" during landing. A representative from Skykits Corporation provided a typed copy of text from the section titled "Normal Landing," (pages 7-16), of the Pilot's Information Handbook for the accident airplane type. The following is stated in the description of a normal approach and landing: "…At approximately 500 feet altitude above the ground, apply 20 degrees of flap, full up trim, and slow to 50 mph IAS..."

The representative also noted that the accident pilot had received 5 hours of flight familiarization from the manufacturer when the airplane was purchased.

TESTS AND RESEARCH

The elevator trim aft control rod and elevator and horizontal stabilizer tip fairings were examined by a National Transportation Safety Board metallurgist. The FAA inspector provided

a picture of the trim assembly taken after the airplane was recovered from the runway to a hangar, still in an inverted position. The metallurgist reported that based on a provided manufacturer's illustration, the positions of the pivot plate and hinge point indicated that the airplane was in a full nose down trim position in the picture.

The metallurgist examined the control rod and noted that it was fractured about 1.5 inches from the aft end fitting centerline. The bearing in the end fittings moved freely, and the rod had local downward bending deformation at the fracture location, consistent with overstress fracture under compression loading.

The metallurgist observed circumferential scoring marks on the rod surface aft of the fracture location, but they did not intersect the fracture surface. There was a series of five, regularly spaced, rectangular marks near each end of the control tube in four quadrants of the tube, totaling 20 marks at each end. Longitudinal depressions were observed near the ends of the aluminum tube on opposing sides, consistent with contact with a gripping tool. The metallurgist noted slight bulging deformation on the lower side of the control rod. The metallurgist removed the aft piece of the control rod from the end fitting and cut it to expose the internal threads; no anomalies were noted. Dimensional checks of the control rod were consistent with the control rod engineering drawing provided by the manufacturer. Hardness of the control rod was measured to be consistent with the hardness value in the material inspection certificate provided by the manufacturer. The metallurgist analyzed the chemical composition of the control rod and found it consistent with the composition shown in the material inspection certificate.

Pilot Information

Certificate:	Flight instructor; Private	**Age:**	63,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Sport pilot	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	May 1, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 1, 2007
Flight Time:	1775 hours (Total, all aircraft), 53 hours (Total, this make and model), 1772 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Skykits	**Registration:**	N769R
Model/Series:	Savannah ADV	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Special light-sport (Special)	**Serial Number:**	06-07-51-509
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	May 1, 2007 Annual	**Certified Max Gross Wt.:**	1234 lbs
Time Since Last Inspection:	63 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	63 Hrs at time of accident	**Engine Manufacturer:**	Rotax
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	912 ULS
Registered Owner:	On file	**Rated Power:**	100 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	U78,5839 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	10:42 Local	**Direction from Accident Site:**	83°
Lowest Cloud Condition:	Few / 3000 ft AGL	**Visibility**	20 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	23 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	20°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lava Hot Spring, ID (00E)	**Type of Flight Plan Filed:**	None
Destination:	Lava Hot Spring, ID (00E)	**Type of Clearance:**	None
Departure Time:	10:12 Local	**Type of Airspace:**	

Airport Information

Airport:	Lava Hot Springs Airport 00E	**Runway Surface Type:**	Dirt;Grass/turf
Airport Elevation:	5268 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	32	**IFR Approach:**	None
Runway Length/Width:	2894 ft / 100 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye
Additional Participating Persons:	Lewis Olson; Federal Aviation Administration; Salt Lake City, UT
Original Publish Date:	December 24, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66763