Aviation Investigation Final Report

Location:	Gregory, Michigan	**Accident Number:**	CEN09LA353
Date & Time:	June 14, 2009, 11:20 Local	**Registration:**	N103MS
Aircraft:	BURKHART GROB G103C TWIN III ACRO	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Glider tow		

Analysis

The pilot reported that the takeoff and climb were normal during the ground launch of the glider until about 400 feet above ground level when the winch cable broke. The pilot stated that he lowered the nose and established a speed of at least 60 knots. He continued the upwind pattern until the glider was in a position to begin a right 180-degree turn in order to line up with the landing area. He stated: “I could feel in the controls that something was not right and the glider was not responding in the manner that I am accustomed. There were none of the signs of a stall and the glider did not behave like it has any time that I have practiced stalls. Before I could determine the cause or take any action, the nose abruptly dropped and we dove toward the intended runway.” The glider impacted the ground nose down and in a right bank. A postaccident inspection confirmed flight control continuity from each control surface to the aft cockpit control stick with two exceptions. The inspection noted two separation points in the flight control push-pull tubes at the aft fuselage and empennage. Both were consistent in location and appearance with overload failures due to impact forces. No anomalies consistent with a pre-impact failure or malfunction were observed. Metallurgical examination of the winch cable revealed features consistent with overstress fracture.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain sufficient airspeed during the turn to return for landing, which resulted an inadvertent stall/spin. Contributing to the accident was the failure of the ground winch tow cable shortly after takeoff.

Findings

Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Aircraft	Aerial tow equipment section - Failure

Factual Information

History of Flight

Initial climb	Glider tow event
Maneuvering	Off-field or emergency landing
Maneuvering	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT
On June 14, 2009, about 1120 eastern daylight time, a Burkhart Grob G103C Twin III Acro glider, N103MS, piloted by a commercial pilot, was destroyed during an in-flight collision with terrain near Gregory, Michigan. The local flight was being conducted under 14 Code of Federal Regulations Part 91 without a flight plan. Visual meteorological conditions prevailed at the time of the accident. The pilot sustained serious injuries and the passenger was fatally injured. The flight departed Richmond Field Airport (69G), Gregory, Michigan, shortly before the accident.

The glider was owned and operated by the Sandhill Glider Club. The accident pilot was a member of the club. The airport (69G) was comprised of a single north-south turf runway. Published dimensions of Runway 18-36 were 2,471 feet long by 100 feet wide. However, glider operations were noted as using the turf area west of the runway. The accident takeoff was performed to the south (Runway 18) using a ground-based winch.

The pilot reported that the takeoff and climb were normal until the glider reached approximately 400 feet above ground level (agl) when the winch cable broke. The pilot stated that he lowered the nose and established a speed of at least 60 knots. He continued the upwind pattern until the glider was in a position to begin a right 180-degree turn to line up with the landing area “with more than 200 [feet] of altitude.” The pilot noted that “at 200 [feet] a glider can safely execute a 180 degree turn back to the runway that it [had] taken off from.”

The pilot stated: “I could feel in the controls that something was not right and the glider was not responding in the manner that I am accustomed. There were none of the signs of a stall and the glider did not behave like it has any time that I have practiced stalls. Before I could determine the cause or take any action, the nose abruptly dropped and we dove toward the intended runway.” The glider impacted the ground nose down and still in a right bank.

A witness stated that the takeoff and transition to a climb appeared normal. However, about 300 to 400 feet agl the cable broke. He noted that the pilot lowered the nose of the glider and turned toward the southeast corner of the field. Upon arriving over the southeast corner of the field, the pilot began a 180-degree right turn in order to line up with the landing area. He commented that this was the normal landing area for the gliders. He stated that as the glider

completed the 180-degree turn, the nose dropped and struck the ground in a near vertical attitude. He added that it completed about a 90-degree rotation (1/4 turn) to the right during the descent.

PERSONNEL INFORMATION

The accident pilot, age 63, held a commercial pilot certificate with single-engine land airplane and glider ratings. He was issued a third-class airman medical certificate on July 21, 2008, with a restriction for corrective lenses. He successfully added the airplane rating to his pilot certificate on May 1, 2009, which met the requirement for a flight review.

The pilot had accumulated 1,150 hours total flight time, with 832 hours in gliders in general and 90 hours specifically in Grob G103C gliders. Within the 30-day period preceding the accident, he had acquired about 1 hour in a Grob G103C glider and 9 hours in single-engine airplanes. The pilot was seated in the aft tandem seating position. The pilot had reportedly served as a former president of the glider club.

The passenger was a certificated pilot and mechanic. He held a commercial pilot certificate with rotorcraft-helicopter and instrument helicopter ratings, and a flight instructor certificate with a rotorcraft-helicopter rating. He also held a mechanic certificate with airframe and powerplant ratings. He was issued a second-class airman medical certificate on August 11, 2008. He had reported a total flight time of 3,150 hours on the medical certificate application.

The pilot-rated passenger had reportedly become a member of the glider club for the day in order to take a glider ride. The accident pilot stated that the passenger was interested in learning to fly gliders. The passenger was seated in the forward tandem seating position.

AIRCRAFT INFORMATION

The accident aircraft was a 1990 model year Burkhart Grob G103C Twin III Acro glider, serial number 34156. It incorporated a two-place tandem seating configuration, with a mid-fuselage mono wing and T-tail empennage design. The glider was owned and operated by the Sandhill Soaring Club of Gregory, Michigan.

Maintenance records provided by the operator indicated that an annual inspection was completed on March 28, 2009. The glider had accumulated about 1,742 hours total flight time at the time of the accident.

Records on file with the FAA indicated that the glider had been involved in a prior landing accident. A Major Repair and Alteration form (FAA form 337), dated January 8, 2003, noted that repairs were made to the fuselage and right wing.

METEOROLOGICAL INFORMATION

Livingston County Spencer J. Hardy Airport (OZW) was about 12 miles north of 69G. Weather conditions recorded by the OZW Automated Weather Observing System (AWOS) at 1116 were: Winds calm, 10 miles visibility, scattered clouds at 6,500 feet agl, temperature 21 degrees

Celsius, dew point 11 degrees Celsius, and altimeter 30.05 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The glider impacted the open field used for glider operations. It came to rest upright on an east-northeast heading. The cockpit area was destroyed. The nose section of the fuselage including the landing gear wheel assembly was embedded into the ground. Both wings remained attached to the fuselage. However, the right wing the right wing was dislocated from the fuselage, exhibiting a tapered gap of approximately 4 inches at the trailing edge to no gap (0 inches) at the leading edge.

The left and right ailerons and both speed brakes remained attached to the wings. Aileron control continuity was confirmed to the aft cockpit control stick. Movement of the control stick produced corresponding movement of both ailerons. The speed brake mechanism appeared to be restricted due to impact damage. However, limited movement of the speed brake handle produced corresponding movement of the speed brake control surfaces on the wings.

The empennage separated from the aft fuselage. It came to rest immediately adjacent to the fuselage at the accident site. The elevator and rudder push-pull tubes were bent/separated at the point where the empennage separated. The elevator push-pull tube was continuous from the aft fuselage to the aft cockpit control stick. The rudder push-pull tube was continuous to the cockpit aft seat position rudder pedals. The linkage to the pedals was bent and deformed consistent with impact damage, but the linkage remained attached to the push-pull tube.

The rudder and elevator remained attached to the vertical and horizontal stabilizers, respectively. The control linkage remained attached to the rudder and elevator control surfaces aft of the separation point. The vertical push-pull tube common to the elevator control system was separated at a point inside the vertical stabilizer. The separation appeared consistent with overload failure due to impact forces.

No anomalies consistent with a pre-impact failure or malfunction were observed.

TESTS AND RESEARCH

Metallurgical examination of the winch cable revealed features consistent with overstress fracture. Specifically, the fracture surfaces exhibited “cup and cone” features, as well as necking of the wire. Both are characteristic of overstress fracture. Wear on the cable appeared to be in the form of rubbing and shear deformation. Flattening of the wire surfaces was also observed. Individual wires within the cable bundle were broken at several locations on both sections of the cable submitted for examination.

ADDITIONAL INFORMATION

A log of the winch operations was maintained by the glider club. The log contained two entries with 2009 dates. The first was May 8, 2009, and referenced work on the winch truck alternator, battery and engine choke. The second was dated May 11, 2009, and referenced “39 launches

for Boy Scouts." According to the log the cable was last replaced on September 24, 2005.

Pilot Information

Certificate:	Commercial	**Age:**	63,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	July 21, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 1, 2009
Flight Time:	1150 hours (Total, all aircraft), 90 hours (Total, this make and model), 926 hours (Pilot In Command, all aircraft), 28 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BURKHART GROB	**Registration:**	N103MS
Model/Series:	G103C TWIN III ACRO	**Aircraft Category:**	Glider
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic	**Serial Number:**	34156
Landing Gear Type:	Tandem	**Seats:**	2
Date/Type of Last Inspection:	March 28, 2009 Annual	**Certified Max Gross Wt.:**	1323 lbs
Time Since Last Inspection:		**Engines:**	0
Airframe Total Time:	1742 Hrs at time of accident	**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	SANDHILL SOARING CLUB	**Rated Power:**	
Operator:	SANDHILL SOARING CLUB	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	OZW,960 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	11:16 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Scattered / 6500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	21°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Gregory, MI (69G)	**Type of Flight Plan Filed:**	None
Destination:	Gregory, MI (69G)	**Type of Clearance:**	None
Departure Time:	11:20 Local	**Type of Airspace:**	

Airport Information

Airport:	Richmond Field 69G	**Runway Surface Type:**	Grass/turf
Airport Elevation:	921 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	2471 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	42.441665,-84.066665(est)

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Ronald Stonewall; FAA-Detroit FSDO; Belleville, MI
Original Publish Date:	July 22, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74039