National Transportation Safety Board
Aviation Accident Final Report

Location:	Oso, WA	**Accident Number:**	SEA04LA063B
Date & Time:	04/01/2004, 1700 PST	**Registration:**	N400WJ
Aircraft:	Glaser-Dirks DG-400	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

While flying in trail along a ridgeline at the same altitude, the pilot of the Glaser-Dirks (lead glider) made a left turn, while the pilot of the Glasflugel (trailing glider) remained on course over the ridgeline. The Glasflugel pilot reported that he recalled that the Glaser-Dirks was at his 10:00 position when he encountered turbulence and he looked down to check his airspeed. When he looked back up, he lost sight of the Glaser-Dirks and assumed that he had rolled out to run the ridgeline to the south. The Glasflugel pilot continued along the ridgeline to the north when the Glaser-Dirks pilot transmitted to the Glasflugel pilot to "watch out/it." The Glasflugel pilot looked around to his left and spotted the other glider about 80 feet away at his 8:00 position and converging at the same altitude. The Glasflugel pilot reacted by making a right banking turn. During this maneuver, the left wing tip of the Glasflugel glider came up under the right wing of the Glaser-Dirks glider. The left wing tip of the Glasflugel contacted the underside of the right wing of the Glaser-Dirks about 13 feet 5 inches outboard of the wing root resulting in the outboard section of the right wing separating in flight. The pilot of the Glaser-Dirks was fatally injured, while the pilot of the Glasflugel was able to bail-out and deploy his parachute.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot of the Glaser-Dirks (lead glider) failure to maintain clearance from the Glasflugel (trailing glider) resulting in a mid-air collision while maneuvering.

Findings

Occurrence #1: MIDAIR COLLISION
Phase of Operation: MANEUVERING

Findings
1. (C) CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On April 1, 2004, about 1700 Pacific standard time, a Glasflugel STD Libelle 201B, N161D, and a Glaser-Dirks DG-400, N400WJ, experienced a mid-air collision while maneuvering over mountainous terrain located about three nautical miles south of Oso, Washington. Visual meteorological conditions prevailed at the time and no flight plan was filed by the pilot of either glider. The pilot of the Glasflugel received minor injuries while the pilot of the Glaser-Dirks was fatally injured. The pilot of the Glasflugel reported that he departed from Arlington Municipal Airport, Arlington, Washington, about 1130, while the pilot of the Glaser-Dirks departed from the same airport about 1600.

When neither glider returned to the airport, a member of the glider club contacted Washington State Department of Transportation Search and Rescue at 2020 and a search was initiated. On April 2, 2004, about 0100, the pilot of the Glasflugel, who had walked out of the mountains, was able to call 911 to report the accident. With the aid of the pilot of the Glasflugel, the wreckage of both gliders were located on Mount Wheeler by 1020 that same day.

The pilot of the Glasflugel reported that he met up with the pilot of the Glaser-Dirks near Boulder Ridge and they flew back to the bowl of White Chuck and Three Fingers Mountain. The two gliders found a thermal and circled to altitude to glide to Wheeler Mountain. Both pilots were in radio contact. The pilot reported that the ridge line they were following runs predominantly in a north-south direction. Both gliders were running in a single-file line, about 1,000 feet above ground level (4,500 feet mean sea level) with the Glaser-Dirks in the lead by about 1,000 feet and at the same altitude. The pilot of the Glaser-Dirks then made a turn to the west (left). The pilot of the Glasflugel recalls that he noted that the Glaser-Dirks was at about his 10:00 position when he encountered turbulence and he looked down to check his airspeed. When he looked back up, he lost sight of the Glaser-Dirks and assumed that he had rolled out to run the ridge to the south. The pilot of the Glasflugel continued to the north. About 20 seconds after last seeing the Glaser-Dirks, the pilot of the Glasflugel heard the pilot of the Glaser-Dirks transmit over the radio, "Paul, Watch Out/It". The pilot looked around to his left and spotted the Glaser-Dirks about 80 feet away at his 8:00 position and converging with "the fuselage appearing to be just below me and his right wingtip just above." The pilot reported that the other glider appeared to be traveling slightly faster and in an increasing bank that appeared to be about 50 degrees just prior to impact. The pilot of the Glasflugel stated that, "As soon as I saw him my immediate reaction was a roll to the right and while doing so I watched as his fuselage turned to an almost parallel axis with my glider yet continue to close." The Glasflugel rolled away from the other glider in about a 30 to 40 degrees bank angle. At this time the pilot stated "...my left wingtip appeared very close to the underside of his right wing several feet inboard of the wingtip."

The pilot stated that he heard the impact and then the next thing he recalls is hearing the wind and feeling it on his face, realizing that the glider was going towards the ground and that the canopy had separated. The pilot did not try to regain control of his glider and released his harness and rolled out onto the left wing to deploy his parachute. The parachute opened just seconds prior to ground impact.

PERSONNEL INFORMATION

The pilot of the Glasflugel held a private pilot certificate for glider operations. At the time of the accident, the pilot reported that he had accumulated a total flight time of 72 hours, with 13 hours in the make and model glider involved in the accident. The pilot held a Class II Federal Aviation Administration (FAA) issued medical certificate dated October 23, 2003.

The pilot of the Glaser-Dirks held a private pilot certificate for glider operations. The pilot's flight logbook indicated a total flight time in all aircraft of 204 hours with a total flight time of 148 hours in gliders. The pilot's last FAA medical examination was dated October 2, 2002. A class III FAA certificate was issued at this time.

WRECKAGE AND IMPACT INFORMATION

Both gliders were located about 300 to 350 feet apart in mountainous terrain at 48 degrees 14.26' North latitude, 121 degrees 54.94' West longitude. The terrain elevation was approximately 3,000 feet mean sea level. The Glasflugel remained intact. The pilot's parachute was located a short distance away.

The wreckage of the Glaser-Dirks was located south of the Glasflugel. The main wreckage consisted of the fuselage and the left wing which remained partially attached. The left wing tip extension section separated and was located about 12 feet uphill (easterly) from the main wreckage. The empennage was deformed to the side. The rudder had separated at the hinges. The right wing separated from the fuselage at the wing root. The right wing inboard about 13 feet 5 inch section was located 50 to 60 feet downhill (westerly) of the main wreckage. The outboard about 10 feet four inch section was located about 25 feet southwesterly from the main wreckage. The right wing tip extension section was located about 200 feet (southerly) from the main wreckage.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot of the Glaser-Dirks by the Snohomish County Medical Examiners Office. The Medical Examiner reported the pilot's cause of death as "...massive blunt force injuries of the head and trunk with multiple skeletal fractures."

Toxicological samples were sent to the Federal Aviation Administration Civil Aeromedical Institute for analysis. The results of the analysis were negative.

ADDITIONAL DATA/INFORMATION

The wreckage of both gliders was recovered by personnel from AvTech Services and transported to a secured facility in Maple Valley, Washington.

On April 13, 2004, investigators from the National Transportation Safety Board and the Federal Aviation Administration inspected both gliders. The right wing of the Glaser-Dirks was reconstructed. The wing had separated from the fuselage at the wing root and was in three major pieces. Sections of the flap and aileron had separated at the hinges. The inboard wing section measured approximately 13 feet five inches. The outboard section of the wing measured approximately 10 feet four inches. The remaining section of the wing was the insertable wing tip extension which separated at the attach point. The area of separation between the inboard wing section and the outboard wing section was heavily fragmented. Some of the carbonfibre material was not present. No impact signatures were noted to the skin surface inboard or outboard of the wing separation point of the inboard and outboard sections.

The left wing of the Glasflugel remained in one piece with some ground impact damage noted

about mid-span. The left side outboard wing tip was damaged and the material fragmented to about two feet inboard. The right wing remained in one piece with wingtip damage noted due to ground impact. The fuselage remained in one piece, however, cracks in the fuselage material were noted aft of the cabin area. The canopy was separated.

The wreckages for both gliders were released to their respective owner's representatives on April 15, 2004.

Pilot Information

Certificate:	Private	**Age:**	48, Male
Airplane Rating(s):	None	**Seat Occupied:**	Center
Other Aircraft Rating(s):	Glider	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	10/02/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	03/21/2004
Flight Time:	204 hours (Total, all aircraft), 1 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Glaser-Dirks	**Registration:**	N400WJ
Model/Series:	DG-400	**Aircraft Category:**	Glider
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Experimental	**Serial Number:**	4-91
Landing Gear Type:	Retractable - Hull; Tailwheel	**Seats:**	1
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	1014 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Rotax
ELT:	Not installed	**Engine Model/Series:**	505
Registered Owner:	William S. Burhen	**Rated Power:**	40 hp
Operator:	William S. Burhen	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	AWO, 137 ft msl	**Distance from Accident Site:**	11 Nautical Miles
Observation Time:	1655 PST	**Direction from Accident Site:**	230°
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.41 inches Hg	**Temperature/Dew Point:**	12°C / 2°C
Precipitation and Obscuration:			
Departure Point:	Arlington, WA (AWO)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	1600 PST	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	48.239722, -121.900000

Administrative Information

Investigator In Charge (IIC):	Debra J Eckrote	**Report Date:**	09/29/2004
Additional Participating Persons:	David G Lehman; FAA-FSDO; Renton, WA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.