National Transportation Safety Board
Aviation Accident Final Report

Location:	Columbus, GA	**Accident Number:**	ERA12LA315
Date & Time:	05/02/2012, 0715 EDT	**Registration:**	N540GZ
Aircraft:	BERRY DEAN GLASAIR I	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot was attempting to take off in an experimental tailwheel-equipped airplane. He stated that the airplane started to accelerate forward on the takeoff roll and pull to the left while he had right rudder applied. The engine hesitated, and he applied more right rudder and full right brake with no results. He aborted the takeoff and applied both brakes to slow the airplane. The airplane exited the left side of the runway and collided with a runway sign; the left main landing gear collapsed, which resulted in structural damage to the airframe. The pilot reported that he had 0.1 hour in the accident airplane make and model. Examination of the wreckage, including the brakes, did not reveal any preimpact mechanical malfunctions or failures that would have precluded normal operation. The engine was subsequently test run at full throttle and no anomalies were noted. The airplane owner's manual indicated that for takeoff, the flaps should be set at 20 degrees and that power should be added slowly to allow airspeed to build and the controls to become effective by the time full power is achieved. Examination of the wreckage revealed that the flaps were in the retracted position. The pilot's lack of experience in the airplane make and model and unfamiliarity with its operating procedures contributed to his failure to use the recommended flap setting for takeoff.

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 directional control during takeoff, which resulted in a runway excursion and collision with a runway sign. Contributing to the accident was the pilot's lack of experience in the airplane make and model, resulting in and his failure to use the recommended flap setting for takeoff.

Findings

Aircraft	Directional control - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Total experience in position - Pilot (Factor) Use of policy/procedure - Pilot (Factor)

Factual Information

On May 2, 2012, at 0715 eastern daylight time, an amateur-built experimental Glasair 1, N540GZ, ran off the runway, collapsed the landing gear, and collided with a sign after aircraft control was lost during an aborted takeoff. The airplane sustained substantial damage to the fuselage. The certificated private pilot was not injured. The airplane was registered to a private owner and was operating as a Title 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed and no flight plan was filed. The flight was originating from Columbus Metropolitan Airport (CSG), Columbus, Georgia, and was en-route to Montgomery Regional Airport, Montgomery, Alabama.

The pilot stated no anomalies were noted during the preflight, engine-start, taxi, or engine run-up. He held the brakes and increased the power to 1,500 rpm before releasing the brakes on runway 24, a 6,997-foot-long, 150-foot-wide, asphalt runway. The airplane started to accelerate forward and pull to the left while the pilot had right rudder applied. The engine hesitated and he then applied more right rudder and full right brake with negative results. The takeoff was aborted and the power was reduced to idle power. He applied both brakes to slow the airplane down and the airplane exited the left side of the runway into the grass. The airplane collided with a runway sign and left main landing gear collapsed.

The pilot, age 32, held a private pilot certificate, with a rating for airplane single-engine land, airplane single-engine sea, and instrument airplane. In addition he held a third-class medical certificate with no restrictions, issued on January 1, 2009. The pilot reported a total flight experience 2,524, hours, and .1 hours in the same make and model as the accident airplane. The pilot had flown 32.1 hours and 15.6 hours during the last 90 days and 30 days preceding the accident, respectively. The pilot's last flight review was on December 29, 2011.

The accident airplane is a Glasair 1 high-performance, two-place, low-wing, fiberglass composite airplane, serial number 208. It was issued a special airworthiness certificate on July 28, 2006. The airplane was powered by a Lycoming O-540-E4B5, 260-horsepower engine modified by the installation of an Airflow Performance fuel injection system. A Catto three-bladed composite fixed-pitch propeller was installed on the airplane.

The last condition inspection was conducted on April 15, 2012, at a Hobbs time of 82.0 hours. The Hobbs meter at the accident site was 83.9 hours. The total airframe hours at the time of the accident were 83.9. The total time since the last condition inspection was 1.9 hours. The engine was overhauled on August 21, 1985, at an engine total time of 3,931.0 hours. The engine was removed from another airplane, disassembled, inspected, repaired, and reassembled on July 15, 2002, at an engine total time of 4,924.0 hours. The engine was installed on a Harmon Rocket on September 24, 2002, with 0 time since the engine was repaired. The engine was removed from the Harmon Rocket on December 8, 2005, at an engine total time of 5,219.7 hours. On July 19, 2005, the engine was installed on the accident airplane.

At that time of the accident, the engine had accumulated 5,303.6 hours of total operation; of which, 379.6 hours were since the engine was repaired. The engine had accumulated 26 years and 9 months since it was last overhauled on August 21, 1985. Lycoming Service instruction No. 1009 AU, titled "Recommended Time Between Overhaul Periods" states: "Engine deterioration in the form of corrosion (rust) and the drying out and hardening of composition materials such as gaskets, seals, flexible hoses and fuel pump diaphragms can occur if an engine is out of service for an extended period of time. Due to the loss of a protective oil film

after an extended period of inactivity, abnormal wear on soft metal bearing surfaces can occur during engine start. Therefore, all engines that do not accumulate the hourly period of time between overhauls specified in this publication are recommended to be overhauled in the twelfth year."

The CSG 0714 surface weather observation, was: wind 090 degrees at 4 knots, visibility 10 miles, clear, temperature 20 degrees Celsius, dew point temperature 17 degrees Celsius, and altimeter 30.09 inches of mercury

The propeller assembly remained attached to the propeller crankshaft flange, and the spinner was not damaged. All three propeller blades remained attached to their respective propeller hubs. The leading edge of one propeller blade was delaminated 7/12 inches outboard of the propeller hub, extending upward to the propeller blade tip. Another propeller blade was not damaged. The outboard 9 inches of the remaining propeller blade was separated.

The upper and lower engine cowlings remained attached and were damaged. The engine assembly remained attached to all engine mounts. The engine assembly was displaced to the left and downward. The lower fuselage was buckled aft of the firewall.

The left and right forward boot cowls were distorted. The left main landing gear separated from the fuselage. The left main landing gear tire exhibited no evidence of flat spots. The left main landing gear tire was rotated freely by hand. The right main landing gear remained attached to the airframe. The right main landing gear tire exhibited no evidence of flat spots. The right main landing gear tire was rotated freely by hand. When hand pressure was applied to the right brake pedal, the right wheel could not be rotated by hand.

The forward windscreen, gull wing door and windows were not damaged. The left and right locking mechanism were checked and could be locked and unlocked. The instrument panel was intact. Continuity of the flight controls was confirmed from the cabin area aft and outboard to all flight control surfaces. The left seatbelt and shoulder harness were in use at the time of the accident. The throttle was in the full forward position.

The leading edge of the right wing was not damaged. The right main fuel tank was ruptured at the wing root. The right aileron was not damaged and remained attached at all hinge points. The right flap remained attached at hinge points and was not damaged. The right flap was not extended.

The empennage was not damaged. The vertical fin, rudder, left and right horizontal stabilizer's, and left and right elevators were not damaged. The full-swivel tail wheel was attached and locked.

The leading edge of the left wing was damaged 20 inches outboard of the wing root. The left main fuel tank was ruptured. About 3 gallons of fuel was recovered from the fuel system. The left aileron was not damaged and remained attached at all hinge points. The left flap remained attached at hinge points and was not damaged. The left flap was not extended.

Examination of the engine assembly revealed the left and right engine exhaust pipes and induction tubes were not damaged. The oil sump was intact and the oil dip stick remained in place. Twelve quarts of oil was measured on the dip stick. The oil filter was removed and opened. The filter media was free of contaminants. The oil cooler was not damaged and remained attached to the engine.

The alternator and drive pulley remained attached to the engine assembly and was not damaged. The alternator belt remained in place and was not broken. The starter remained attached to the engine and the drive pinion was retracted. The left magneto remained attached to its mount. The right magneto remained attached to its mount. Both magnetos produced spark at all ignition leads when the magneto was rotated by turning the propeller. The top and bottom ignition harnesses were not damaged. A vacuum pump was not installed.

The experimental fuel injector servo remained attached to the engine. The throttle and mixture control cables remained attached to the servo. The servo fuel inlet screen was removed and was free of contaminants. The fuel lines leading to engine driven fuel pump and the fuel injector servo were disconnected and fuel was present in the lines. The engine driven fuel pump remained attached to the engine and was not removed. The fuel flow divider was not removed. The fuel injector nozzles were not removed. All spark plugs were removed. All spark plugs exhibited dark gray combustion deposits and worn normal condition, except Nos. 2, 4, and 6 bottom, which were oil soaked. At the accident site, the engine came to rest on its left side with cylinders No. 2, 4, and 6 lower than the oil sump.

The engine was partially disassembled. The engine was rotated by turning the propeller. Suction and compression was obtained on all cylinders. All removed components were reinstalled. A club propeller was installed on the airplane. A fuel supply can and a battery was installed. The airplane was tied down to a flat bed. The engine was started and run at idle power for 1 minute. The throttle was advanced to 1900 rpm and a magneto check was conducted. No anomalies were noted. The engine was run at full throttle and returned to idle power and shut down. The upper sparkplugs were removed. The interiors of the cylinders were inspected with a lighted bore scope and no anomalies were noted.

The Glasair Owner's Manual states in Chapter 4, Normal Operations, and paragraph 4-6.1 "Set the flap at the first notch (20 degrees). Align the airplane with the runway centerline, add just enough power to get rolling, and lock the tail wheel."

History of Flight

Takeoff-rejected takeoff	Loss of control on ground (Defining event)
	Runway excursion
	Collision with terr/obj (non-CFIT)
	Landing gear collapse

Pilot Information

Certificate:	Private	**Age:**	32, Male
Airplane Rating(s):	Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without Waivers/Limitations	**Last Medical Exam:**	01/22/2009
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	12/29/2011
Flight Time:	2524 hours (Total, all aircraft), 0 hours (Total, this make and model), 2524 hours (Pilot In Command, all aircraft), 32 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BERRY DEAN	**Registration:**	N540GZ
Model/Series:	GLASAIR I	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental	**Serial Number:**	208
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	04/15/2012, Conditional	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:	20 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	84 Hours	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-540-E4B5
Registered Owner:	WADE GEORGE A	**Rated Power:**	300 hp
Operator:	Bernie W. Vasquez	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	CSG, 397 ft msl	**Observation Time:**	0651 EDT
Distance from Accident Site:		**Condition of Light:**	Day
Direction from Accident Site:		**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	20°C / 17°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	4 knots, 90°	**Visibility (RVR):**	
Altimeter Setting:	30.09 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Columbus, GA (CSG)	**Type of Flight Plan Filed:**	None
Destination:	Montgomery, AL (MGM)	**Type of Clearance:**	None
Departure Time:	0714 EDT	**Type of Airspace:**	

Airport Information

Airport:	Columbus Metropolitan Airport (CSG)	**Runway Surface Type:**	Asphalt
Airport Elevation:	397 ft	**Runway Surface Condition:**	Dry
Runway Used:	24	**IFR Approach:**	None
Runway Length/Width:	6997 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Carrol A Smith	**Adopted Date:**	09/05/2013
Additional Participating Persons:	James D Nichols; FAA Atlanta FSDO; Hapeville, FL Mike Childers; Lycoming Engines; White, GA		
Publish Date:	09/05/2013		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=83535		

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