Aviation Investigation Final Report

Location:	Glendora, California	**Accident Number:**	WPR11FA117
Date & Time:	January 31, 2011, 15:25 Local	**Registration:**	N6922A
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:	Collision with terr/obj (non-CFIT)	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor reported that he and the commercially certificated student flew to mountainous terrain to practice using orographic lift. The flight instructor stated that the lift they were flying in began to dissipate so he took the flight controls and added full power to depart the area. Suddenly, they encountered a strong downdraft and moments later they impacted the terrain. It is likely that the airplane was not at a sufficient altitude for the pilot to recover from the downdraft encounter and clear the terrain. The flight instructor told local authorities at the time of his rescue that there were no problems with the airplane. A postaccident examination revealed no evidence of any preimpact mechanical anomalies with the airframe or engine 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 flight crew's failure to maintain adequate terrain clearance while maneuvering in downdraft conditions over mountains.

Findings

Aircraft	Altitude - Not attained/maintained
Environmental issues	Mountainous/hilly terrain - Not specified
Environmental issues	Downdraft - Contributed to outcome
Personnel issues	Decision making/judgment - Flight crew

Factual Information

History of Flight

Maneuvering	Collision with terr/obj (non-CFIT) (Defining event)

HISTORY OF FLIGHT

On January 31, 2011, approximately 1525 Pacific standard time, a Cessna 172, N6922A, sustained substantial damage when it impacted mountainous terrain while maneuvering near Glendora, California. The flight instructor received serious injuries and the commercial pilot receiving instruction received minor injuries. The flight instructor/owner was operating the airplane under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the local instructional flight, which had originated from Brackett Field (POC), La Verne, California, about 2 hours 30 minutes before the accident. No flight plan had been filed.

The flight instructor said that this was a training mission for his student to get more experience in a tail wheel equipped airplane and flying in mountainous terrain. After approximately 2 hours of traffic pattern work with touch-and-go landings, they departed for a local practice area for some air work. Due to air traffic congestion in the practice area, they flew to more mountainous terrain to practice utilizing orographic lift.

The flight instructor said the lift they were flying in began to dissipate. He took the flight controls and added full power to depart the area. Suddenly, they encountered a strong downdraft and moments later they impacted the terrain. Rescue teams were sent to the area, and because of the steepness of the terrain a helicopter was used to evacuate the two injured occupants.

The flight instructor told local authorities, at the time of his rescue, that “they had no problems with the airplane.”

PERSONNEL INFORMATION

The 53-year-old flight instructor’s most recent second-class Federal Aviation Administration (FAA) medical certificate was issued on February 2, 2010. He held a flight instructor certificate with single engine land airplane rating, a commercial pilot certificate with a single engine land and multi-engine land airplane ratings, and an instrument airplane rating. He estimated that his total flight time was about 1,800 hours.

The 37-year-old commercial pilot receiving instruction held a second-class FAA medical certificate, which was issued on January 7, 2010. He held a commercial pilot certificate with a

single engine land airplane rating. At the time of his rescue, he told local authorities that he had approximately 300 hours of flight experience.

AIRCRAFT INFORMATION

The airplane was a single-engine, propeller-driven, four seat airplane, with dual flight controls, which was manufactured by Cessna Aircraft Company in 1956. Its maximum takeoff gross weight was 2,300 pounds. It was powered by a Continental O-300-A reciprocating, direct-drive, air-cooled, normally aspirated engine, which had a maximum takeoff rating of 145 horsepower at sea level. Maintenance records indicate that the last 100-hour inspection was performed on January 30, 2011. The airplane had been converted from a tricycle landing gear configuration to a tail wheel landing gear configuration.

METEOROLOGICAL INFORMATION

At 1553, the reported weather conditions at Chino, California, located 130 degrees for 16 nautical miles from the accident site, were as follows: wind from 260 at 8 knots; visibility 10 statute miles; few clouds at 4,000 feet and scattered clouds at 25,000 feet; temperature 63 degrees Fahrenheit; dew point 45 degrees Fahrenheit; altimeter setting 30.09 inches of Mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane was found about 400 feet below a 2,300-foot elevation ridge line on steep terrain. Examination of photos taken by local authorities revealed that a ground scar of approximately 100 degrees led to the wreckage. The nose of the airplane was compressed aft and up into the cockpit. The fuselage, just in front of the empennage, was compressed and wrinkled; both horizontal stabilizers were bent and wrinkled. Half of the left elevator was torn away, and both wings were bent and wrinkled.

An airframe and engine exam was performed on February 9, 2011, by a National Transportation Safety Board Senior Air Safety Investigator and representatives from both the airframe and engine manufacturers. Flight control cable continuity was confirmed for all flight controls, though several of the cables had been cut for aircraft recovery. The propeller assembly remained attached to the engine’s crankshaft. The upper spark plugs were removed from the engine and noted to exhibit normal wear. The engine’s crankshaft was free to rotate and thumb compression was observed in proper order on all six cylinders. Mechanical continuity was established throughout the rotating group, valve train, and accessory section during hand rotation of the propeller.

No evidence of any preimpact mechanical anomalies were noted with the airframe or engine that would have precluded normal operation.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	53,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 2, 2010
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	1800 hours (Total, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Commercial	**Age:**	37,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	January 7, 2010
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 22, 2010
Flight Time:	300 hours (Total, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N6922A
Model/Series:	172	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	29022
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	January 30, 2011 100 hour	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2796 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-300A
Registered Owner:	Gene A. Yu	**Rated Power:**	145 Horsepower
Operator:	Gene A. Yu	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CNO,635 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	130°
Lowest Cloud Condition:	Few / 4000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	260°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	17°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	La Verne, CA (POC)	**Type of Flight Plan Filed:**	None
Destination:	La Verne, CA (POC)	**Type of Clearance:**	Unknown
Departure Time:	14:32 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	34.160831,-117.879165

Administrative Information

Investigator In Charge (IIC):	Struhsaker, James
Additional Participating Persons:	Michael J Spencer; FAA FSDO; Riverside, CA
Original Publish Date:	November 29, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=78252