Aviation Investigation Final Report

Location:	Mojave, California	**Accident Number:**	LAX05LA216
Date & Time:	June 26, 2005, 15:11 Local	**Registration:**	N3BZ
Aircraft:	Cessna 337G	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 3 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane impacted a light post, a hotel, and terrain shortly after takeoff. The pilot reported that the ground roll and liftoff seemed normal. He reported retracting the landing gear and flaps while at a 300-foot/minute climb at 90 miles/hour. He said the flight encountered a downdraft shortly after that during the takeoff initial climb at around 200 to 300 feet above ground level. When the flight encountered the reported downdraft, the engine instruments indicated that both the front and rear engines were producing 24 inches of manifold pressure and 2,500 rpm. The pilot said he was unable to arrest the descent prior to colliding with the hotel and light post. Post-accident examination of the aircraft and engines provided no evidence of a malfunction or failure that would have precluded normal operation of the engines. Review of the closest weather facility's recorded weather data (located 17 nautical miles away) revealed the flight had a likely headwind of 11 knots and a computed density altitude of 4,903 feet. The calculated performance data revealed that the airplane should have been able to climb about a rate of 850 feet/minute with both engines operative and at normal climb speed of 109 miles/hour.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's encounter with a downdraft or wind shear during takeoff the initial climb.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) WEATHER CONDITION - DOWNDRAFT

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
2. (C) CLIMB - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
3. OBJECT - POLE
4. OBJECT - BUILDING(NONRESIDENTIAL)

Factual Information

On June 26, 2005, at 1511 Pacific daylight time, a Cessna 337G (Skymaster) airplane, N3BZ, impacted a light post, a hotel, and terrain during a forced landing that took place shortly after departing the Mojave Airport, Mojave, California. The private pilot sustained serious injuries and his three passengers sustained minor injuries. The airplane was substantially damaged. The pilot operated the personal flight under the provisions of 14 CFR Part 91. Visual meteorological conditions prevailed and a visual flight rules flight plan was filed for the flight, which departed Mojave a few minutes prior to the accident, and was destined for Van Nuys, California.

The Cessna 337G utilizes two Continental IO-360 engines; one mounted on the nose of the airplane, and the other mounted aft of the fuselage (often referred to as a push-pull engine/propeller configuration). The airplane has two tail booms that extend aft from the left and right wing, respectively, and are joined at the trailing end of the airplane via a horizontal stabilizer and elevator. A vertical stabilizer and rudder attach to the end of each tail boom.

According to the Federal Aviation Administration (FAA) inspector who interviewed the pilot and the passengers, they all reported that the pilot applied full power for takeoff and the airplane climbed to approximately 200 feet above the ground. At that point, the airplane encountered wind shear and began sinking. According to the passenger seated in the left rear seat, he noted both engines were indicating 24 inches of manifold pressure and 2,500 rpm as the airplane sank. He asked the pilot if everything was okay and the pilot responded that he had it under control.

The airplane continued to descend and eventually impacted the ground, which was followed by the right wing's impact with a light post. The airplane erupted in flames as it continued toward the sidewall of a hotel. The airplane slid along the wall, crossed over the northbound lanes of highway 14, before coming to rest upright on the southbound lanes of the highway. The rear seat passengers exited the airplane followed by the front seat passenger and pilot.

According to the pilot's written statement, they departed from runway 26 as the wind was from 220 degrees at 15 to 18 knots. The takeoff was "normal" and the airplane climbed at a rate of 300 feet/minute. The pilot retracted the landing gear and raised the flaps. The airplane continued to climb, but around 300 feet above ground level (agl), the pilot felt a "downdraft and a sharp loss of altitude." He checked all engine instruments and airspeed, all of which "indicated okay." The pilot lowered the nose in an attempt to gain more airspeed, and noted a building in his flight path. The pilot attempted to fly the airplane toward an alleyway and informed his passengers to prepare for an emergency landing. The airplane impacted a light post, and a hotel.

The airplane was photo documented on scene, then transported to Aircraft Recovery Services, Pearblossom, California, for further examination.

Post-accident examination of the wreckage by a National Transportation Safety Board investigator, an FAA inspector, and investigators from Teledyne Continental Motors (TCM) and Cessna Aircraft Company, both parties to the investigation, revealed the fuselage and center wing section sustained significant fire damage. The inboard portions of both wings were also significantly fire damaged and the right wing had separated in two at the tail boom junction. Flight control continuity was established from the cockpit to all flight control surfaces with the exception of the left aileron, which was consumed by fire. The flap actuator was separated from the wing and sustained fire damage. Measurement of the actuator revealed it was extended about 0.9 inches, which according to Cessna, equated to approximately 2 degrees of flap extension. The throttle quadrant was examined and both throttles were in the full forward position, both propeller controls were full forward, and the front engine mixture control was near the cutoff position, and the rear engine mixture control was just forward of the cutoff position. The fuel selector handles were consumed by the fire, but examination of the selectors revealed that the left side fuel selector was positioned to the left wing. The right side selector was significantly fire damaged and the position was unreliable.

The front propeller remained attached to the engine and the propeller blades displayed significant s-bending and chordwise gouging and scrapes. Approximately 6 inches of propeller blade tip separated from one of the blades and was located at the accident site. The front engine [IO-360-G serial number 352339] was examined and revealed no anomalies that would have prevented its normal operation. Compression was obtained from each cylinder and continuity was noted throughout the engine crankshaft and camshaft. Both magnetos produced spark at each terminal during rotation of their drive shafts.

The rear propeller separated from the engine just aft of the propeller mounting flange. The fractures surfaces displayed 45-degree shear lips. The propeller blades were curled aft at their tips. The rear engine [IO-360-D(23C)CG serial number 57622] sustained fire damage and its magnetos were melted. The fuel pump was removed and found dry but internally intact. Two of the fuel injectors (number 2 and 3 cylinders) were found partially clogged. The engine crankshaft was rotated and continuity was noted from the accessory section to the crankshaft fracture area. Compression was obtained from each cylinder and valve train continuity was noted. The engine was disassembled and no anomalies were noted that would have prevented its normal operation.

The TCM engine investigator noted that both engines appeared to have been run lean after reviewing the spark plugs and cylinders.

The Edwards Air Force Base (EDW) weather observation facility, which is located approximately 17 nautical miles southeast of the accident site, reported the following weather conditions at 1455: wind from 250 degrees at 11 knots; visibility 85 statute miles; a few clouds at 6,000 feet; temperature 32 degrees Celsius; dew point -04 degrees Celsius; altimeter setting

of 29.82 inches of mercury. Utilizing this data, along with the elevation at EDW, the density altitude was calculated to be 4,943 feet.

A review of the aircraft's owner manual, under the performance section, revealed that with the weather data referenced above and utilizing the aircraft's maximum gross weight, the airplane should have been able to climb out at a rate of approximately 850 feet/minute with both engines operative. However, this climb rate would be obtained with an indicated airspeed of about 109 miles/hour. The pilot reported that he was climbing at 90 miles/hour and obtaining a 300-foot/minute rate of climb. The stall speed on the Cessna 337 with flaps up is 80 miles/hour.

Pilot Information

Certificate:	Private	**Age:**	68,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	October 1, 2004
Flight Time:	2000 hours (Total, all aircraft), 800 hours (Total, this make and model), 1600 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3BZ
Model/Series:	337G	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	33701637
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	November 1, 2004 Annual	**Certified Max Gross Wt.:**	4630 lbs
Time Since Last Inspection:	15 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	1860 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-360-G
Registered Owner:	On file	**Rated Power:**	210 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:	EDW,2299 ft msl	**Distance from Accident Site:**	17 Nautical Miles
Observation Time:	14:55 Local	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Few / 6000 ft AGL	**Visibility**	85 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.81 inches Hg	**Temperature/Dew Point:**	32°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Mohave, CA (MHV)	**Type of Flight Plan Filed:**	VFR
Destination:	Van Nuys, CA (VNY)	**Type of Clearance:**	VFR
Departure Time:	15:09 Local	**Type of Airspace:**	

Airport Information

Airport:	Mojave Airport MHV	**Runway Surface Type:**	Asphalt
Airport Elevation:		**Runway Surface Condition:**	Dry
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	7050 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 Minor	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 3 Minor	**Latitude, Longitude:**	35.066665,-118.183334

Administrative Information

Investigator In Charge (IIC):	Charnon, Nicole
Additional Participating Persons:	Lad Scott; Federal Aviation Administration; Van Nuys, CA Randall S Mainquist; Cessna Aircraft Company; Wichita, KS Jason Lukasik; Teledyne Continental Motors; Mobile, AL Frank Motter; Federal Aviation Administration; Van Nuys, CA
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