



National Transportation Safety Board Aviation Accident Final Report

Location:	Long Beach, CA	Accident Number:	LAX03LA020
Date & Time:	11/02/2002, 1051 PST	Registration:	N184TA
Aircraft:	Cessna T182T	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 None

Flight Conducted Under: Part 91: General Aviation - Instructional

Analysis

During the takeoff roll portion of a touch-and-go, the airplane veered off the runway and collided with a taxiway sign. The CFI said the first two circuits around the traffic pattern were uneventful, and the student performed satisfactorily. During the third touch-and-go landing the student indicated that the airplane turned right without his application of right rudder pressure. The CFI responded by instructing her student in the proper usage of the rudder pedal. The flight continued around the traffic pattern. The student then performed a normal power on approach with 30 degrees of wing flaps extended for another touch-and-go landing. The touchdown was not hard, and no vibrations or unusual noises were noted. As the student increased the engine power to takeoff and was raising the wing flaps, the airplane again started an uncommanded right turn. The student told the CFI to take control of the airplane and she immediately took the controls and applied left rudder to redirect the airplane back onto the runway. The CFI said that when she pushed on the left pedal the airplane veered even more toward the right, and it collided with a taxiway sign. Thereafter, the CFI elected to continue the takeoff, full engine power was developed, and the airplane took off. During the climb out both pilots had difficulty maintaining control of the airplane. The CFI made an emergency landing at the airport on runway 30. The touchdown, rollout, and taxi to parking were accomplished by the CFI without difficulty. No unusual sounds, vibrations, or braking problems were noted. All of the tires remained inflated and an exhaustive examination of the control system, nose wheel steering mechanism and brakes/tires found no evidence of an anomaly. A series of low and high-speed taxi tests up to 55 knots were performed with the accident airplane under the supervision of FAA Inspectors and the airplane operated normally with no difficulty maintaining directional control. Cessna Aircraft Company personnel subsequently performed a ground steering test on an exemplar airplane to determine the nose gear operating characteristics as the nose gear (tire) is lifted off the ground. When the nose strut extends to the point where the tire is no longer resting on the ground, the strut/wheel is designed to center and lock out rudder pedal steering. The test results noted three specific pitch attitudes: 1) with the center of the leading edge of the elevator approximately 34 inches above the ground, the nose wheel is on the ground, and the strut and wheel turn when the rudder pedals were operated; 2) When the center of the leading edge of the elevator is 29.5 inches above the ground, the nose tire is just touching the ground, and the nose wheel does not

turn with application of rudder pedals; 3) when the center of the leading edge of the elevator was about 16 inches above the ground (tailcone tiedown also contacting the ground), the nose wheel was also off the ground and would not move using the ruder pedals. The FAA reported that the top of the "J2" sign was about 34 inches above ground level. In a normal 3-point resting attitude the airplane's elevator is about 41 inches above ground level . To contact the top of the taxiway sign, a Cessna T182T needs to pitch upward such that its elevator lowers 7 inches.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The student's failure to maintain directional control and the instructor's inadequate supervision of the flight by his delayed remedial action.

Findings

Occurrence #1: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: TAKEOFF - ROLL/RUN

Findings

1. (C) DIRECTIONAL CONTROL - NOT MAINTAINED - DUAL STUDENT
2. (C) SUPERVISION - INADEQUATE - PILOT IN COMMAND(CFI)
3. (C) REMEDIAL ACTION - DELAYED - PILOT IN COMMAND(CFI)

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - ROLL/RUN

Findings

4. OBJECT - AIRPORT SIGN/MARKER

Factual Information

HISTORY OF FLIGHT

On November 2, 2002, about 1051 Pacific standard time, a Cessna T182T, N184TA, veered off runway 25L and collided with a taxiway sign during takeoff from the Long Beach, California, airport. The airplane, operated by Flight Pros, Inc., was substantially damaged. Neither the certified flight instructor (CFI) nor the student was injured. Visual meteorological conditions prevailed. The instructional flight was performed under the provisions of 14 CFR Part 91, and it originated from Long Beach about 0930.

The CFI reported to the National Transportation Safety Board investigator that during the accident flight her student was practicing takeoffs and landings. The first two circuits around the traffic pattern were uneventful, and the student performed satisfactorily. During the third touch-and-go landing the student indicated that the airplane turned right without his application of right rudder pressure. The CFI responded by instructing her student in the proper usage of the rudder pedal. The flight continued around the traffic pattern.

The CFI indicated that her student then performed a normal power on approach with 30 degrees of wing flaps extended. The CFI planned to have her student perform another touch-and-go landing. The touchdown was not hard, and no vibrations or unusual noises were noted. As the student increased the engine power to takeoff and was raising the wing flaps, the airplane again started an uncommanded right turn. The student told the CFI to take control of the airplane.

The CFI additionally reported that she immediately took the controls and applied left rudder to redirect the airplane back onto the runway. She did not fully depress the left rudder pedal. The CFI said that when she pushed on the left pedal the airplane veered even more toward the right, and it collided with a taxiway sign. Thereafter, the CFI elected to continue the takeoff, full engine power was developed, and the airplane departed.

During the climb out both pilots had difficulty maintaining control of the airplane. The CFI made an emergency landing at the airport on runway 30. The touchdown, rollout, and taxi to parking were accomplished by the CFI without difficulty. No unusual sounds, vibrations, or braking problems were noted. All of the tires remained inflated.

PERSONNEL INFORMATION

The CFI reported that she had a total of 1,556 flight hours, of which 63 hours were flown in the accident model of airplane. Her total instructor time (dual hours given) was 322 hours of which 40 hours were flown in the accident model of airplane. The pilot became a CFI on March 4, 2002. On that date she reported her weight was 140 pounds.

The student reportedly had a total flight time of about 16 hours. The majority of the student's flight time was acquired during the preceding 90-day period and flying the accident airplane. The student's pilot certificate had not been endorsed by any flight instructor for solo flying privileges. On May 14, 2002, the student had reported that his weight was 235 pounds.

AIRPLANE INFORMATION

The airplane was manufactured in 2001, and it was issued a normal category airworthiness certificate in December 2001. At the time of the accident, the airplane and engine's total time

was about 131 hours. According to the Federal Aviation Administration (FAA), upon a review of the airplane's maintenance records, no evidence was found of the airplane having been involved in any previous accident or having sustained any prior damage or repair.

AIRPORT INFORMATION

Long Beach Airport's asphalt surfaced runway 25L is 5,420 feet long by 150 feet wide. A taxiway sign is located about 36 feet north of the right side of runway 25L, in a near level dirt area about 1,143 feet upwind from the runway's threshold. The sign is located east of intersecting taxiway "J2," and the sign is labeled "J2."

Long Beach Airport operation's personnel reported that N184TA had collided with the taxiway "J2" sign. The ground area directly beyond (upwind) the taxiway "J2" sign consists of a hard packed open dirt field. Operations personnel reported that this ground provides approximately 2,000 feet of clear area in the direction the airplane was headed at the time of impact (see the airport diagram and photographs).

TESTS AND RESEARCH

Structural Examination.

Under the supervision of the FAA, participants from the Cessna Aircraft Company examined the accident airplane. In pertinent part, the participants noted the following:

1. All flight controls were found attached to the airplane except for the right elevator, which was impact-damaged, deformed, and partially separated from the bent right stabilizer;
2. The rudder cable control continuity was confirmed, and the pedals and pulleys moved freely;
3. The rudder cable tension was measured and was found in compliance with Cessna's maintenance manual specifications;
4. The pulley guards were observed intact;
5. The center pedestal was removed and no obstructions to the rudder cables or pulleys were observed;
6. The offset of the rudder was observed when the rudder pedals and trim were neutralized. The full left and right rudder movement was measured to be approximately the same in both directions;
7. The nose wheel steering system and shimmy dampener were observed intact;
8. The nose tire and the main tires rotated freely. No flat spots or evidence of under inflation was observed; and
9. No evidence of excessive brake wear was found.

Taxi Tests.

A series of low and high-speed taxi tests were performed with the accident airplane. Initially, the airplane was accelerated between 5 and 10 knots. The brakes were applied several times. According to the FAA, the airplane appeared to operate normally. Thereafter, the airplane's speed was incrementally increased until reaching about 55 knots. The FAA opined that the airplane continued to operate normally.

Steering Characteristics, Examination and Measurements.

Cessna Aircraft Company personnel subsequently performed a ground steering test on an exemplar airplane. The test was conducted to determine the nose gear operating characteristics as the nose gear (tire) is lifted off the ground. According to Cessna personnel, when the nose strut extends to the point where the tire is no longer resting on the ground, the strut/wheel is designed to center.

Regarding three specific pitch attitudes, with the center of the leading edge of the elevator approximately 34 inches above the ground, the nose wheel is on the ground and the strut and wheel turned when the rudder pedals were operated. When the center of the leading edge of the elevator is 29.5 inches above the ground, the nose tire is just touching the ground and the nose wheel does not turn with application of pressure to the rudder pedals. In an extreme pitch up attitude, the tail cone tie down contacted the ground when the center of the leading edge of the elevator was about 16 inches above the ground. At this pitch angle, the nose wheel was also off the ground and would not move using the ruder pedals.

ADDITIONAL INFORMATION

The FAA reported that the top of the "J2" sign was about 34 inches above ground level. The Cessna participant reported that the airplane's elevator is about 41 inches above ground level when the airplane is in a level attitude, resting on three wheels. To contact the top of the taxiway sign, a Cessna T182T needs to pitch upward such that its elevator lowers 7 inches.

Flight Instructor Information

Certificate:	Flight Instructor; Commercial	Age:	39, Female
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Single-engine	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	07/12/2001
Occupational Pilot:		Last Flight Review or Equivalent:	03/04/2002
Flight Time:	1556 hours (Total, all aircraft), 63 hours (Total, this make and model), 1420 hours (Pilot In Command, all aircraft), 205 hours (Last 90 days, all aircraft), 71 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Student Pilot Information

Certificate:	Student	Age:	40, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	05/14/2002
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	16 hours (Total, all aircraft), 16 hours (Total, this make and model), 0 hours (Pilot In Command, all aircraft), 16 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N184TA
Model/Series:	T182T	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	T18208111
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	12/27/2002, Annual	Certified Max Gross Wt.:	3112 lbs
Time Since Last Inspection:	131 Hours	Engines:	1 Reciprocating
Airframe Total Time:	131 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	TIO-540AKIA
Registered Owner:	Tom's Aircraft Maintenance, Inc.	Rated Power:	235 hp
Operator:	Flight Pros, Inc.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	LGB, 58 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	1056 PST	Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 25000 ft agl	Visibility	3 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	320°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	19° C / 11° C
Precipitation and Obscuration:			
Departure Point:	Long Beach, CA (LGB)	Type of Flight Plan Filed:	None
Destination:	Long Beach, CA (LGB)	Type of Clearance:	VFR
Departure Time:	0930 PST	Type of Airspace:	Class D

Airport Information

Airport:	Long Beach (LGB)	Runway Surface Type:	Asphalt
Airport Elevation:	58 ft	Runway Surface Condition:	Dry
Runway Used:	25L	IFR Approach:	None
Runway Length/Width:	5420 ft / 150 ft	VFR Approach/Landing:	Touch and Go; Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	33.817778, -118.151667

Administrative Information

Investigator In Charge (IIC): Wayne Pollack **Report Date:** 10/28/2004

Additional Participating Persons: Catherine VanAssche; Federal Aviation Administration; Long Beach, CA
Tom Teplik; Cessna Aircraft Company; Wichita, KS

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.nts.gov/pubdms/>.

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