National Transportation Safety Board
Aviation Accident Final Report

Location:	Deland, FL	**Accident Number:**	MIA06LA001
Date & Time:	10/03/2005, 1505 EDT	**Registration:**	N7895J
Aircraft:	Pilatus PC-6/B2-H2	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	4 Serious, 6 Minor
Flight Conducted Under:	Part 91: General Aviation - Skydiving		

Analysis

The airline transport certificated pilot with 10 skydiving passengers began a takeoff in a tailwheel-equipped and turboprop powered airplane on a CFR Part 91 skydiving flight. As the airplane started its climb, the pitch angle of the nose of the airplane increased until the airplane appeared to stall about 50 to 100 feet agl. It descended and impacted the runway in a left wing, nose low attitude. Several FAA inspectors responded to the accident site and documented the accident scene and the airplane systems. The inspectors reported that flight control continuity was established, and they noted that the stabilizer appeared to be in a nose-up trim position. Measurement of the stabilizer trim position equated to a 56.5 percent nose-up trim condition. The airplane's horizontal stabilizer trim system is electrical. An electric trim indicator, and a trim warning light were installed in the upper left portion of the instrument panel. The light will illuminate if "full-up" trim is set, and the engine is producing over 80 percent power. A placard stating, "Set Correct Trim for Takeoff," was installed on the lower instrument panel in front of the pilot position. The airplane's flight manual contains a "Before Takeoff" warning, which states, in part: "Warning - An extreme out-of-trim stabilizer can, in combination with loading, flaps position and power influence, result in an uncontrollable aircraft after the aircraft leaves the ground." In addition, a caution states, in part: "Caution - Failure to set correct trim settings will result in large control forces and/or unrequested pitching/yawing." Pilot actions listed in the "Before Takeoff" checklist include stabilizer trim settings. The airplane contained seat belts for all passengers, but the pilot's shoulder harness was not used, as it was folded and tie-wrapped near its upper attach point.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's incorrect setting of the stabilizer trim and his failure to maintain adequate airspeed during takeoff initial climb, which resulted in a stall. A factor contributing to the accident was an inadvertent stall. A factor contributing to the severity of the pilot's injuries was his failure to utilize his shoulder harness.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) TRIM SETTING - INCORRECT - PILOT IN COMMAND
2. (C) AIRSPEED(VS) - NOT MAINTAINED - PILOT IN COMMAND
3. (F) STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. TERRAIN CONDITION - RUNWAY
5. (F) SHOULDER HARNESS - NOT USED - PILOT IN COMMAND

Factual Information

On October 3, 2005, about 1505 eastern daylight time, a tailwheel-equipped Pilatus PC-6 airplane, N7895J, sustained substantial damage when it collided with the runway following a loss of control during takeoff initial climb from the DeLand Municipal Airport, DeLand, Florida. The airplane was being operated as a Title 14 CFR Part 91, skydiving flight when the accident occurred. The airplane was operated by Skydive DeLand, Inc., DeLand. The airline transport certificated pilot and three passengers received serious injuries. Six additional passengers received minor injuries. Visual meteorological conditions prevailed and no flight plan was filed.

The accident flight was the seventh jump/flight of the day. Witnesses on the ground stated the airplane departed runway 05 about mid-field, and climbed to about 50 to 100 feet. As the airplane started its climb, the pitch angle of the nose of the airplane increased until the airplane appeared to stall. It then descended and impacted the runway in a left wing, and nose low attitude. The airplane slid off the runway and pivoted about 180 degrees into the grass, adjacent to the runway.

Several Federal Aviation Administration (FAA) inspectors from the Orlando Flight Standards District Office (FSDO), Orlando, Florida, responded to the accident site and documented the accident scene and the airplane systems. The inspectors reported that flight control continuity was established. The airplane contained seat belts for all passengers, but the pilot's shoulder harness was not used, as it was folded and tie-wrapped near its upper attach point. According to the operator, the pilot had accrued about 43 hours in the accident airplane.

Aircraft Information

The airplane's horizontal stabilizer trim system is electrical. Dual motor actuators are installed with one end attached to the fuselage, and the other end attached to the horizontal stabilizer. Trim switches are located on the pilot's control column grips. An alternate trim control system, with an actuator control switch, was positioned on the lower instrument panel to the right of the throttle quadrant. The alternate trim system operates at half the speed of the main system. A guarded trim-interrupt switch was installed on the lower instrument panel to the right of the throttle quadrant, and will disable both trim systems.

The airplane is equipped with a stall warning light and warning tone. An electric trim indicator gauge, and a trim warning light were installed in the upper left portion of the instrument panel. The FAA reported that the warning light should illuminate if "full-up" trim was set, and the engine was producing over 80 percent power. A placard stating, "Set Correct Trim for Takeoff," was installed on the lower instrument panel in front of the pilot position.

The airplane's flight manual contains a "Before Takeoff" warning, which states, in part: "Warning - An extreme out-of-trim stabilizer can, in combination with loading, flaps position and power influence, result in an uncontrollable aircraft after the aircraft leaves the ground." In addition, a caution states, in part: "Caution - Failure to set correct trim settings will result in large control forces and/or unrequested pitching/yawing." Pilot actions listed in the "Before Takeoff" checklist include stabilizer trim settings, which state, in part: "Stabilizer - If trim warning system installed, check no light or sound; For mid c.g. [center of gravity], Green Mark (0); For Forward/Aft c.g., Green Arc (2 degrees nose up/2 degrees nose down."

FAA inspectors at the accident scene noted that the stabilizer appeared to be in a nose-up trim

position. According to the airplane maintenance manual, the trim position is measured from the top longeron of the fuselage, to the bottom spar of the stabilizer. Neutral trim has a measurement of 2.13 inches. Full up-trim has a measurement of 4.22 inches. The inspector's measurement of the stabilizer trim was 3.31 inches, nose-up trim. The inspectors reported that their measurement of the trim position equated to a 56.5 percent nose-up trim condition. The inspectors also reported that when other pilots that had flown the accident airplane were interviewed, they commented that the airplane is "very difficult, if not impossible to control if a takeoff was initiated with full up-trim."

The FAA inspectors reported that the airplane was estimated to have an aft center of gravity with an estimated takeoff weight of 5,659 pounds. The airplane's maximum takeoff weight was 6,173 pounds.

In 2000, the manufacturer issued Service Bulletin (SB) 180, that called for installation of a Pilatus trim warning system. The warning system utilizes a visual and audio warning, and installation of a warning placard on the glare shield, which states, "Warning: Set Correct Trim Before Take Off." The service bulletin had not been complied with.

Following the pilot's recovery from the accident, the pilot was interview by an FAA inspector.

Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	37, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With Waivers/Limitations	**Last FAA Medical Exam:**	07/01/2005
Occupational Pilot:		**Last Flight Review or Equivalent:**	01/01/2005
Flight Time:	5233 hours (Total, all aircraft), 43 hours (Total, this make and model), 2093 hours (Pilot In Command, all aircraft), 62 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Pilatus	**Registration:**	N7895J
Model/Series:	PC-6/B2-H2	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	767
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	09/01/2005, 100 Hour	**Certified Max Gross Wt.:**	6173 lbs
Time Since Last Inspection:	7 Hours	**Engines:**	1 Turbo Prop
Airframe Total Time:	6517 Hours as of last inspection	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6-34
Registered Owner:	Vertical Air Inc.	**Rated Power:**	783 hp
Operator:	Skydive Deland, Inc	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	KDAB, 34 ft msl	**Distance from Accident Site:**	13 Nautical Miles
Observation Time:	1453 EST	**Direction from Accident Site:**	65°
Lowest Cloud Condition:	Few / 2400 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	15 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	70°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	28°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Deland, FL (KDED)	**Type of Flight Plan Filed:**	Company VFR
Destination:		**Type of Clearance:**	None
Departure Time:	1505 EDT	**Type of Airspace:**	

Airport Information

Airport:	DeLand Municipal (KDED)	**Runway Surface Type:**	Asphalt
Airport Elevation:	79 ft	**Runway Surface Condition:**	Dry
Runway Used:	05	**IFR Approach:**	None
Runway Length/Width:	3984 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 Serious, 6 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Serious, 6 Minor	**Latitude, Longitude:**	29.069722, -81.289444

Administrative Information

Investigator In Charge (IIC):	Jose Obregon	**Report Date:**	01/31/2008
Additional Participating Persons:	Robert E Jex; FAA Orlando FSDO-15; Orlando, FL		
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/.		