



Aviation Investigation Final Report

Location:	Belleville, Michigan	Accident Number:	CHI00LA312
Date & Time:	September 14, 2000, 22:15 Local	Registration:	N806BF
Aircraft:	Cessna 208B	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The airplane sustained substantial tail section damage on contact with the ramp surface while standing on the ramp. The flight encountered a shift in cargo on takeoff roll, aborted its takeoff, and taxied back to the ramp where its tail contacted the ramp on engine shutdown. The pilot was uninjured. A FAA inspector's record of interview stated, "According to [the pilot], prior to this incident only three to four straps were used. ... [The pilot] went on to explain that the cargo shifted upon the takeoff roll. ... Upon returning to the ramp he shut down the engine and that's when the aircraft fell on its tail. ... He also said that he was glad that it didn't happen after he had rotated because he was sure that he would have been a fatal accident." A FAA inspector's record of interview stated, "[The witness] stated that when the aircraft sat on its tail, [the Fixed Base Operator (FBO) there] was asked to unload the cargo, which only had one strap holding it down, the 'D' ring had come loose from the floor attachment, and that the cargo was still on rollers under the skid. [The witness] stated that they initially loaded the cargo on the aircraft only, and that the pilot was the one that secured the cargo prior to the incident. After the incident [the FBO] un-loaded the cargo on request of the pilot ... and then was asked to reload the cargo by [the pilot] because the pilot stated something about a hernia. [The witness] stated that the only way they would load the cargo on the airplane again was if they loaded and secured the cargo per their procedures because when [the pilot] secured the cargo he only used one strap and left the load on the rollers. ... [The witness] stated that the plane departed the airport with the cargo about 45 minutes after the accident." The NTSB Materials Laboratory Factual Report number 01-069 stated, "Examination of the plunger revealed that there were portions of the pin in each end of the pin hole. The portion that would have retained the plunger over the body was missing. ... The distance from the lowest point on the plunger pin ... to the underside of the plunger ... was measured and found to be 0.684 inches. The fracture face, [of one of the roll pins], displayed a shiny granular appearance typical of a brittle fracture. ... The side view ... illustrates the plunger in its lowest position with the pin contacting the bottom of the stud body hole.... In this position there is a gap of 0.09 inches between the bottom of the plunger ... and the bottom of the stud body...."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's improper securing of the cargo that led up to the cargo shift during takeoff roll. A factor was the cargo restraint failure.

Findings

Occurrence #1: CARGO SHIFT

Phase of Operation: TAKEOFF - ROLL/RUN

Findings

1. (C) CARGO/BAGGAGE - SHIFTED
2. (C) SECURITY OF CARGO - IMPROPER - PILOT IN COMMAND
3. (F) MISC EQPT/FURNISHINGS,CARGO RESTRAINTS - FAILURE

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER

Phase of Operation: STANDING

Findings

4. TERRAIN CONDITION - GROUND

Factual Information

Pilot Information

Certificate:	Airline transport; Flight instructor	Age:	49, 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:	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 Valid Medical-w/ waivers/lim	Last FAA Medical Exam:	June 16, 2000
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	July 10, 2000
Flight Time:	4390 hours (Total, all aircraft), 76 hours (Total, this make and model), 3967 hours (Pilot In Command, all aircraft), 186 hours (Last 90 days, all aircraft), 71 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

The pilot was an airline transport pilot. He held single, multiengine, and instrument ratings with instructor ratings in the same. He held a Second Class Medical Certificate with limitations for glasses. He reported his total flight time as 4,390 hours, total time in make and model as 75.8 hours, and 71 hours in the last 30 days.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N806BF
Model/Series:	208B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	208B-0806
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	August 29, 2000 AAIP	Certified Max Gross Wt.:	8750 lbs
Time Since Last Inspection:	29 Hrs	Engines:	1 Turbo prop
Airframe Total Time:	125 Hrs	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, not activated	Engine Model/Series:	PT6-114A
Registered Owner:	Thunder Aviation Acquisition	Rated Power:	675 Horsepower
Operator:		Operating Certificate(s) Held:	On-demand air taxi (135)

The airplane was a Cessna 208B, serial number 208B-0806. The last AAIP inspection was performed on August 29, 2000. The airplane had accumulated 29.2 hours time since its last inspection.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	YIP, 716 ft msl	Distance from Accident Site:	
Observation Time:	18:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	290°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	54°C / 54°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Belleville, MI (YIP)	Type of Flight Plan Filed:	None
Destination:	Bedford, IN (BFR)	Type of Clearance:	
Departure Time:	18:30 Local	Type of Airspace:	

At 2153, the YIP weather was: Wind 290 degrees at 8 knots; visibility 10 statute miles; sky condition clear; temperature 12 degrees C; dew point 12 degrees C; altimeter 29.91 inches of mercury.

Airport Information

Airport:	Willow Run Airport YIP	Runway Surface Type:	
Airport Elevation:	716 ft msl	Runway Surface Condition:	Unknown
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	42.236389,-83.527496(est)

Tests and Research

An FAA inspector acquired the double stud cargo tie down ring from the operator. The ring was sent to the National Transportation Safety Board Materials Laboratory for examination.

National Transportation Safety Board Materials Laboratory Factual Report number 01-069 stated:

Examination of the plunger revealed that there were portions of the pin in each end of the pin hole. The portion that would have retained the plunger over the body was missing. ...

The distance from the lowest point on the plunger pin ... to the underside of the plunger ... was measured and found to be 0.684 inches.

The fracture face, [of one of the roll pins], displayed a shiny granular appearance typical of a brittle fracture. ...

The side view ... illustrates the plunger in its lowest position with the pin contacting the bottom of the stud body hole In this

position there is a gap of 0.09 inches between the bottom of the plunger ... and the bottom of the stud body (See appended National Transportation Safety Board Materials Laboratory Factual Report number 01-069.)

Additional Information

The parties to the investigation included the FAA and Telair International.

The aircraft's tie down ring was returned to Thunder Aviation.

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	Grant Gillian; FAA; St. Ann, MO
Original Publish Date:	April 23, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=50676

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).