



Aviation Investigation Final Report

Location:	Gary, Indiana	Accident Number:	CEN09LA088
Date & Time:	December 14, 2008, 14:45 Local	Registration:	N573BA
Aircraft:	Bombardier CL-600-2B16	Aircraft Damage:	Substantial
Defining Event:	Hard landing	Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The pilot flying the airplane reported that during the approach to Runway 12, he called for the flaps to be set to "Flaps 30" instead of the normal "Flaps 45" due to the strong crosswinds. The airspeed was "bugged" at 150 knots to account for the Vref corrections for the reduced flap setting, winds, and gusts. When the airplane was on the approach about 1.5 miles from the runway, air traffic control reported the winds as 170 degrees at 18 knots gusting to 32 knots. During the flare, the pilot took out the crab angle and slipped the airplane to maintain runway centerline. He reported that he felt like the airplane would not come down during the flare, and he applied forward pressure to the yoke. While holding the forward pressure, the airplane's nose dropped to the runway with the nose gear hitting the runway first, followed by the main landing gear. The airplane bounced and became airborne. He immediately applied go-around thrust and stowed the spoilers that he had instinctively deployed during the landing. An uneventful landing was made using "Flaps 45" at an alternate airport. The inspection of the airplane revealed no preexisting anomalies that would have precluded normal flight. A review of the airplane's flight data indicated that the airplane touched down at 154 knots. The Vref speed for a normal "Flaps 45" landing was 120 knots. According to the Bombardier Quick Reference Handbook (QRH) abnormal procedures section, the appropriate airspeed additive was 7 knots for a "Flaps 30" landing if a FLAPS FAIL indication precludes a normal landing with "Flaps 45." The Bombardier QRH does not provide for a "FLAPS 30" landing for a crosswind landing.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's excessive airspeed and improper flare while landing in gusting winds.

Findings

Aircraft	Airspeed - Incorrect use/operation
Aircraft	Landing flare - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	Gusts - Ability to respond/compensate

Factual Information

History of Flight

Landing-flare/touchdown	Hard landing (Defining event)
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On December 14, 2008, about 1445 central standard time (all times cst), a Bombardier CL-600-2B16, N573BA, operated by the Boeing Company, sustained substantial damage during a hard landing on runway 12 (7,003 feet by 150 feet, asphalt) at the Gary/Chicago International Airport (GYG), Gary, Indiana. The 14 CFR Part 91 positioning flight departed the Chicago Midway International Airport (MDW) at 1435 with GYG as the intended destination. During the landing at GYG, the nose wheel of the airplane hit the runway hard and the airplane bounced. The flight crew executed a go around and attempted a second landing, but discontinued the landing due to strong crosswinds. The flight crew elected to return to MDW and made an uneventful landing. Inspection of the airplane revealed substantial damage to the nose of the airplane. The two pilots and one flight attendant were not injured. Visual meteorological conditions prevailed at the time of the accident. An instrument flight rules (IFR) flight plan was filed.

Earlier in the day, the flight originated from Los Angeles International Airport (LAX), Los Angeles, California, with GYG as the intended destination. Between 1314 and 1322, the flight made two approaches to runway 12 at GYG but did not land due to the crosswinds they experienced during the final approach for landing. After the second go-around, the flight diverted to MDW and landed without incident. The passengers on board were off loaded and provided ground transportation to their destinations. The pilots learned that two company airplanes had landed at GYG since they had diverted to MDW. They decided to attempt another landing at GYG, and the pilot-in-command (PIC) filed a new IFR flight plan and the flight departed for GYG.

The second in command (SIC) was the pilot flying (PF) the airplane and was seated in the left seat. The PIC was the pilot monitoring (PM) the flight and was in the right seat. The PF reported that during the visual approach to runway 12 at GYG, the flaps were set to Flaps 30 instead of the normal Flaps 45 due to the strong crosswinds. The PF called for the airspeed to be "bugged" at 140 knots. The PM reported that he bugged the airspeed at 150 knots to account for the Vref corrections for the reduced flap setting, winds, and gusts.

The tower air traffic controller (tower) at GYG provided numerous wind updates to the flight crew during the approach. When the flight initially checked in with the tower at GYG, they were given the winds as 180 degrees at 25 knots gusting to 32 knots. When the airplane was on the approach about 1.5 miles from the runway, the tower reported the winds as 170 degrees at 18 knots gusting to 32 knots. About the same time, approach air traffic control recorded a low altitude alert for the airplane. Just prior to touchdown, the tower reported the winds as 150 degrees at 18 knots.

The PF reported that flying the approach required numerous thrust lever adjustments and control deflections. He reported that he was crabbing the airplane into the wind during the approach to maintain runway centerline. During the flare, he took out the crab angle and slipped the airplane to maintain runway centerline. He reported that he felt like the airplane would not come down during the flare, and he applied forward pressure to the yoke. While holding the forward pressure, the airplane's nose dropped to the runway with the nose gear hitting the runway first, followed by the main landing gear. He reported that the airplane bounced and became airborne again. He immediately applied go-around thrust and stowed the spoilers that he had instinctively deployed during the landing. The PF called for the landing gear to be raised and the flaps set to Flaps 20. The PM checked the hydraulic synoptic page for the status of the landing gear and raised the gear and set Flaps 20 when he saw normal indications. The PF attempted another landing at GYY, but did a go-around during the second approach and returned to MDW.

The flight returned to MDW where the PF flew the ILS RWY 31C approach and circled to land on runway 22L. An uneventful landing was made using Flaps 45. The taxi was uneventful. The PIC exited the airplane for the post-flight inspection and discovered the damage in the area of the nose wheel well.

The inspection of the airplane revealed no pre-existing anomalies that would have precluded normal flight. A review of the airplane's flight data indicated that the airplane touched down at 154 knots.

The Bombardier Quick Reference Handbook (QRH) indicated that the Vref for the accident airplane at its landing weight using Flaps 45 was 120 knots. According to the Bombardier QRH abnormal procedures section, the appropriate additive is 7 knots for a Flap 30 landing if you have a FLAPS FAIL indication that precludes a normal landing with Flaps 45. The Bombardier QRH does not provide for a FLAPS 30 landing for a crosswind landing.

Pilot Information

Certificate:	Airline transport	Age:	39
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 1 Without waivers/limitations	Last FAA Medical Exam:	July 3, 2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	September 11, 2008
Flight Time:	4885 hours (Total, all aircraft), 1454 hours (Total, this make and model), 1867 hours (Pilot In Command, all aircraft), 91 hours (Last 90 days, all aircraft), 31 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Commercial; Flight engineer; Flight instructor	Age:	36, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	August 14, 2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	July 24, 2008
Flight Time:	8682 hours (Total, all aircraft), 743 hours (Total, this make and model), 4776 hours (Pilot In Command, all aircraft), 64 hours (Last 90 days, all aircraft), 23 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bombardier	Registration:	N573BA
Model/Series:	CL-600-2B16	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	5573
Landing Gear Type:	Retractable - Tricycle	Seats:	13
Date/Type of Last Inspection:	November 20, 2008 AAIP	Certified Max Gross Wt.:	48200 lbs
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:	3524 Hrs at time of accident	Engine Manufacturer:	General Electric
ELT:	Installed, not activated	Engine Model/Series:	CF34-3B
Registered Owner:	CEF 2002 Aircraft LLC	Rated Power:	9248 Lbs thrust
Operator:	The Boeing Company	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	GYG, 620 ft msl	Distance from Accident Site:	
Observation Time:	14:45 Local	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Overcast / 2000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	20 knots / 32 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.7 inches Hg	Temperature/Dew Point:	9°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Chicago, IL (MDW)	Type of Flight Plan Filed:	IFR
Destination:	Gary, IN (GYG)	Type of Clearance:	IFR
Departure Time:	14:35 Local	Type of Airspace:	

Airport Information

Airport:	Gary International Airport GYY	Runway Surface Type:	Asphalt
Airport Elevation:	591 ft msl	Runway Surface Condition:	Dry
Runway Used:	12	IFR Approach:	Circling
Runway Length/Width:	7003 ft / 150 ft	VFR Approach/Landing:	Go around

Wreckage and Impact Information

Crew Injuries:	3 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	41.616111,-87.41278

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Mike Keena; FAA South Bend FSDO; South Bend, IN Alan Dean; The Boeing Company; Chicago, IL
Original Publish Date:	June 11, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=69568

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