



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Baltimore, Maryland	Accident Number:	DCA16CA207
Date & Time:	August 4, 2016, 21:02 Local	Registration:	N368SW
Aircraft:	Boeing 737 3H4	Aircraft Damage:	Substantial
Defining Event:	Ground handling event	Injuries:	134 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

On August 4, 2016 at 9:02pm eastern daylight time, Southwest Airlines flight 149, a Boeing 737, N368SW, experienced a failure of the nose landing gear during pushback from the gate at the Baltimore/Washington Thurgood Marshall International Airport (BWI), Baltimore, Maryland. The aircraft was substantially damaged and there were no injuries to the 6 crewmembers or 129 passengers but the airplane was substantially damaged. The flight was being operated under 14 Code of Federal Regulation Part 121 as a regularly scheduled passenger flight to Atlanta-Hartsfield International Airport (ATL), Atlanta, Georgia.

According to the flight crew, as the pushback tug was maneuvering the aircraft off the gate, the flight crew felt the front of the airplane bounce up and down, and then came to rest on the nose. The passengers were deplaned via air stairs.

The nose gear collapsed in a forward direction, resulting in substantial damage to the gear structure, the nose gear well, and crushing the forward bulkhead. An airport surveillance camera video was obtained, which showed the tug pushing the aircraft at approximately 6 knots. The tug specifications indicate that speed could be achieved only in second gear or higher. The airline general operating manual specifies that pushback must be conducted in low or first gear, and at a walking speed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the tug operators excessive speed during pushback.

Findings

Aircraft	Towing - Incorrect use/operation
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Factual Information

History of Flight

Pushback/towing	Ground handling event (Defining event)
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Pilot Information

Certificate:	Airline transport	Age:	51
Airplane Rating(s):	Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	4-point
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:	March 14, 2016
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	June 8, 2016
Flight Time:	20000 hours (Total, all aircraft), 16000 hours (Total, this make and model), 15200 hours (Pilot In Command, all aircraft), 190 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 9 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	Age:	45
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	4-point
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:	March 8, 2016
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	April 22, 2016
Flight Time:	13800 hours (Total, all aircraft), 7000 hours (Total, this make and model), 9000 hours (Pilot In Command, all aircraft), 120 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 9 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	Registration:	N368SW
Model/Series:	737 3H4 3H4	Aircraft Category:	Airplane
Year of Manufacture:	1993	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	26579
Landing Gear Type:	Retractable - Tricycle	Seats:	151
Date/Type of Last Inspection:	July 28, 2016	Certified Max Gross Wt.:	138499 lbs
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:	72354 Hrs at time of accident	Engine Manufacturer:	CFM INTL.
ELT:	Not installed	Engine Model/Series:	CFM56 SERIES
Registered Owner:		Rated Power:	
Operator:		Operating Certificate(s) Held:	Flag carrier (121)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	KBWI	Distance from Accident Site:	
Observation Time:	20:22 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Few / 5000 ft AGL	Visibility	10 miles
Lowest Ceiling:	25000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	170°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	26°C / 17°C
Precipitation and Obscuration:			
Departure Point:	Baltimore, MD (KBWI)	Type of Flight Plan Filed:	IFR
Destination:	Atlanta, GA (KATL)	Type of Clearance:	IFR
Departure Time:	21:00 Local	Type of Airspace:	

Airport Information

Airport:	Baltimore/Thurgood Marshall In KBWI	Runway Surface Type:	
Airport Elevation:	143 ft msl	Runway Surface Condition:	Dry
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	5 None	Aircraft Damage:	Substantial
Passenger Injuries:	129 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	134 None	Latitude, Longitude:	39,-76(est)

Administrative Information

Investigator In Charge (IIC):	English, William
Additional Participating Persons:	
Original Publish Date:	January 23, 2017
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=93766

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).