



National Transportation Safety Board Aviation Accident Final Report

Location:	Albuquerque, NM	Accident Number:	DCA11FA035
Date & Time:	03/22/2011, 2038 MDT	Registration:	N173UP
Aircraft:	AIRBUS F4-622R	Aircraft Damage:	Substantial
Defining Event:	Hard landing	Injuries:	2 None
Flight Conducted Under:	Part 121: Air Carrier - Non-scheduled		

Analysis

The captain was the pilot flying and properly briefed the approach and completed the appropriate checklists before landing. The reported winds at the time of landing was 320 degrees at 16 knots that would result in about a 13-knot crosswind and the flight crew properly computed the approach speed of 132 knots. According to UPS stabilized approach criteria, airspeed should remain within +10 and -5 knots of the computed final approach speed. Below 1,000 feet above the ground, the indicated airspeed decreased to as low as 129 knots, but did not go below Vref (127 knots). The first officer properly called out the low airspeed and adjusted the target airspeed. Throughout the final approach, the pitch attitude was stable at about 5 to 6 degrees nose up. Although the airspeed was slightly slow during the last 1,000 feet of the approach, the airplane remained within UPS stabilized approach criteria.

The airplane first touched down on the right main landing gear (MLG) at a pitch attitude of 6.7 degrees, followed shortly thereafter by touchdown on the left MLG. The pitch attitude at touchdown was slightly less than the 7-8 degrees described as typical in the UPS Pilot Training Guide (PTG). Although the radio altitude did not show a bounce, it is likely that the aircraft struts rebounded after the initial touchdown giving the flight crew a sensation of a bounce.

The UPS PTG stated under "Bounce Recovery" that to recover from a light bounce (5 feet or less), continue the landing, use power as required to soften the second touchdown, maintain or regain a normal landing attitude, and be aware of increased landing distance. It stated with emphasis not to increase pitch attitude as this could cause a tailstrike. The airplane touched down in the normal touchdown zone and the pitch attitude was well below that required for a tailstrike of 11.2 degrees.

UPS had a "No Fault Go-Around" policy, which stated that the decision to go around should not involve pride, pressure, hesitation, jeopardy or fault, and that crews should discuss and prepare for a go-around before each approach. The UPS PTG also stated that "at any time during an approach if the crew feels conditions are not satisfactory, the approach should not be continued." Although the captain stated that his decision to go around was prompted by a wind

gust that lifted the right wing, it is more likely that the hard touchdown caused the struts to rebound and prompted the go around. Even though the airplane did not bounce into the air as they thought, the crews' actions were within the company policy.

Approximately one second after the initial touchdown, the ground spoilers began to deploy, followed by an increase in pitch in the next two seconds from 4.2 degrees to 12.7 degrees. As the ground spoilers reached their maximum, the thrust levers were advanced to commence the go around and the tailstrike occurred as the pitch attitude passed 11.2 degrees while the airplane was still on the ground. Pitch attitude continued to increase to more than 14 degrees while the aircraft was still on the ground. The A300 Airplane Operating Manual (AOM) stated that the airplane has a slight pitch up tendency at touchdown as the ground spoilers extended, and that the flight crew must be prepared for this pitch-up tendency. It is likely that the crew did not anticipate the spoiler-induced pitch-up after touchdown, which resulted in the tailstrike.

The AOM also stated that during a manual go-around, the application of Takeoff Go Around (TOGA) thrust can result in a rapid pitch-up to an excessive nose high attitude. From 6 to 11 seconds after initial touchdown, the engines accelerated to near full power, accompanied by a further increase in pitch from 14.1 degrees to 17.2 degrees while the airplane remained below 50 feet radar altitude. While the desired manual go-around pitch attitude was 17.5 degrees, it is implicit that the 11.2 degree ground contact pitch attitude limit must be respected while on or in close proximity to the ground. The degree to which thrust-induced pitch-up exacerbated the tailstrike cannot be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The captain's failure to control the airplane pitch-up induced by ground spoiler deployment during the go-around.

Findings

Personnel issues

Aircraft control - Pilot (Cause)

Factual Information

On March 22, 2011, about 2038 mountain daylight time, UPS flight 797, an Airbus A-300F, N173UP, experienced a tail strike during a go-around at Albuquerque International Sunport (ABQ), Albuquerque, New Mexico. The airplane received substantial damage and the flight crew was not injured. Visual meteorological conditions prevailed. The flight was operating under 14 Code of Federal Regulations Part 121 as a domestic cargo flight from El Paso International Airport (ELP), El Paso, Texas.

According to the flight crew and recorder data, the captain was the pilot flying and the takeoff, climb and cruise portion of the flight was uneventful., Prior to landing, the captain conducted the approach briefing, indicating that they would conduct a visual approach to runway 26, the gusty winds required a wind additive to the approach speed and would go-around if the approach was not stabilized.

On final approach, the local controller cleared the flight to land and reported the winds were 310 degrees at 16 knots. The flight crew stated that at 1000 feet AGL the landing checklist was complete, the airplane was fully configured for landing and the approach speed was set to 132 knots ($V_{ref} + 5$).

Recorder data indicated that during the final approach, the autothrottle was disconnected about 800 feet above the ground and the airspeed decreased to as low as 129 knots but did not go below V_{ref} (127 knots). The first officer (FO) stated that he called out the low airspeed and adjusted the target airspeed from 132 to 134 knots. The captain increased power during the approach but the airspeed remained slightly below V_{app} until landing. Pitch attitude on final approach was stable at about 5 to 6 degrees nose up. The pitch attitude at touchdown was about 7 degrees and the airplane touched down first on the right main landing gear (MLG) and then on the left MLG. The flight crew stated that they felt that the airplane bounced and both called for a go around simultaneously. About one second after the initial touchdown, the ground spoilers began to deploy, followed by an increase in pitch in the next two seconds from 4.2 degrees to 12.7 degrees. Thrust levers advanced to near maximum thrust about one second after the left MLG touched down and as the ground spoilers were in transit. Pitch attitude continued to increase to more than 14 degrees while the airplane was still on the ground. Neither flight crewmember was aware of a tail strike until the captain discovered damage to the airplane during the post flight inspection..

The tail strike resulted in aft fuselage skin cracks and numerous sheared rivets, internal structural damage to the frames, a cracked support bracket, buckled floor beam, buckled main cargo deck floor panels, and buckled stringers.

History of Flight

Landing-flare/touchdown Hard landing (Defining event)

Pilot Information

Certificate:	Airline Transport; Commercial	Age:	58
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	01/11/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	09/21/2010
Flight Time:	15000 hours (Total, all aircraft), 642 hours (Total, this make and model), 5000 hours (Pilot In Command, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport; Commercial	Age:	42
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	01/03/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	9000 hours (Total, all aircraft), 2500 hours (Total, this make and model), 2250 hours (Pilot In Command, all aircraft), 134 hours (Last 90 days, all aircraft), 45 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	AIRBUS	Registration:	N173UP
Model/Series:	F4-622R	Aircraft Category:	Airplane
Year of Manufacture:	2006	Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	0868
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	03/21/2011, Continuous Airworthiness	Certified Max Gross Wt.:	375900 lbs
Time Since Last Inspection:		Engines:	2 Turbo Fan
Airframe Total Time:	6004 Hours	Engine Manufacturer:	Pratt and Whitney
ELT:	Installed, not activated	Engine Model/Series:	4158
Registered Owner:	United Parcel Service Company	Rated Power:	58000 lbs
Operator:	United Parcel Service Company	Air Carrier Operating Certificate:	Supplemental
Operator Does Business As:		Operator Designator Code:	IPXA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night
Observation Facility, Elevation:	ABQ, 5355 ft msl	Observation Time:	2056
Distance from Accident Site:		Direction from Accident Site:	
Lowest Cloud Condition:	Few / 10000 ft agl	Temperature/Dew Point:	10° C / -3° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	16 knots, 320°	Visibility (RVR):	
Altimeter Setting:	29.94 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:			
Departure Point:	El Paso, TX (ELP)	Type of Flight Plan Filed:	Unknown
Destination:	Albuquerque, NM (ABQ)	Type of Clearance:	IFR
Departure Time:	1936 MDT	Type of Airspace:	Unknown

Airport Information

Airport:	Albuquerque International (ABQ)	Runway Surface Type:	Concrete
Airport Elevation:	5355 ft	Runway Surface Condition:	Dry
Runway Used:	26	IFR Approach:	Visual
Runway Length/Width:	6000 ft / 150 ft	VFR Approach/Landing:	Go Around

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:	35.033333, -106.600000 (est)

Administrative Information

Investigator In Charge (IIC):	John W Lovell	Adopted Date:	02/23/2017
Additional Participating Persons:			
Publish Date:	10/31/2017		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=78652		

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