



Aviation Investigation Final Report

Location:	SFO International Airport, California	Accident Number:	DCA19CA192
Date & Time:	August 5, 2019, 23:00 Local	Registration:	N37437 (A1); N432UA (A2)
Aircraft:	Boeing 737 (A1); Airbus A320 (A2)	Aircraft Damage:	Minor (A1); Substantial (A2)
Defining Event:	Airport occurrence	Injuries:	163 None (A1); 142 None (A2)
Flight Conducted Under:	Part 121: Air carrier - Scheduled (A1); Part 121: Air carrier - Scheduled (A2)		

Analysis

On August 5, 2019, at about 2315 PDT, United (UA) flight 435, a Boeing B737-924ER, N37437, collided with UA flight 2201, an Airbus A320-232, N432UA, while taxiing to the gate after landing at San Francisco International Airport (SFO), San Francisco, California. There were no injuries to the passengers or crew on either airplane. The B737 sustained minor damage and the A320 sustained substantial damage. Both flights were operating as 14 *Code of Federal Regulations* Part 121 scheduled passenger flights. Flight 435 had arrived from Ellison Onizuka Kona International Airport at Keahole (KOA), Kailua-Kona, Hawaii, and flight 2201 arrived from Los Angeles International Airport (LAX), Los Angeles, California.

The captain of UA 435 stated that after landing, they were instructed by United G Ramp Tower (Ramp Tower) to hold at Plot 9, spot 11-1 to await a gate. When they arrived at the spot, UA 2201 was parked at spot 11-2 and another Airbus A320 was parked at spot 11-3. When UA 435 was cleared to taxi from spot 11-1, the captain noted that they were centered on their taxi line (11-1) and that UA flight 2201 was centered on their line (11-2). The captain ensured his left wingtip was clear of UA 2201 as he began to taxi and then turned his attention back forward to continue the taxi. A few seconds later, he felt a moderate bump and the nose pulled to the left. The captain stopped the airplane and set the parking brake and observed that their left winglet had struck UA 2201's right wing.

The Federal Aviation Administration (FAA) Principal Avionics Inspector (PAI) for United stated the distance between Spot 11-1 and Spot 11-2 was 100 feet. SFO airport operations marked the nose landing gear tire locations of both aircraft after the event and found that UA 2201 was parked 4 feet off the centerline, closer to spot 11-3, resulting in an effective distance

between spot 11-1 and 11-2 of 104 feet. The wingspan of UA 2201's A320 was 117 feet and UA 435's B737 was 117 feet, so the provided spacing should have been over 117 feet to keep the wingtips from touching. The spacing between the centerlines for spot 11-1 and 11-2 was inadequate for UA flight 435 to have cleared the wing of UA 2201.

Examination of the pilot charts and Ramp Tower maps found differences for parking spots 11-1 through 11-3. The pilot chart depicted taxi lines that existed prior to restriping that occurred in March 2015. The old taxi lines, before restriping, had the centerlines of spot 11-1 and 11-2 further away from each other and would have given sufficient spacing for a B737 and an A320. The Ramp Tower's Procedures Manual identified the largest airplane allowed for parking Spot 11-1 was a "CRJ", which has a wingspan of about 76 feet. For Spots 11-2 and 11-3 the largest airplane indicated is a Boeing B757-300W. However, United Ramp Tower directed UA flight 435, a Boeing 737, to park on Spot 11-1.

Subsequent to the accident, the operator published a revised chart and sent an alert to pilots of the changes.

Probable Cause and Findings

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

the ramp controller directing a Boeing 737 to hold in a location that was marked for a regional jet.

Findings

Organizational issues (A1)	(general) - Operator
Personnel issues (A1)	Issuing instructions - Ground crew
Personnel issues (A2)	Issuing instructions - Ground crew
Organizational issues (A2)	(general) - Operator

Factual Information

History of Flight

Taxi (A1)	Airport occurrence (Defining event)
Standing (A2)	Airport occurrence

Pilot Information (A1)

Certificate:	Airline transport; Flight engineer	Age:	57
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 With waivers/limitations	Last FAA Medical Exam:	March 21, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	May 3, 2019
Flight Time:	19500 hours (Total, all aircraft), 7255 hours (Total, this make and model), 9860 hours (Pilot In Command, all aircraft), 180 hours (Last 90 days, all aircraft), 90 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Co-pilot Information (A1)

Certificate:	Airline transport; Commercial	Age:	40
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):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	October 11, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	January 13, 2019
Flight Time:	6415 hours (Total, all aircraft), 1836 hours (Total, this make and model), 1590 hours (Pilot In Command, all aircraft), 134 hours (Last 90 days, all aircraft), 37 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information (A1)

Aircraft Make:	Boeing	Registration:	N37437
Model/Series:	737 924ER	Aircraft Category:	Airplane
Year of Manufacture:	2009	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	33532
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:		Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	2
Airframe Total Time:		Engine Manufacturer:	Cfm Intl
ELT:	Not installed	Engine Model/Series:	CFM56-7B26/3
Registered Owner:	United Airlines Inc	Rated Power:	
Operator:	UNITED AIR LINES INC	Operating Certificate(s) Held:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	UALA

Aircraft and Owner/Operator Information (A2)

Aircraft Make:	Airbus	Registration:	N432UA
Model/Series:	A320 232	Aircraft Category:	Airplane
Year of Manufacture:	1996	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	587
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:		Certified Max Gross Wt.:	169756 lbs
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:		Engine Manufacturer:	lae
ELT:		Engine Model/Series:	V2500SERIES
Registered Owner:	Us Bank Na Trustee	Rated Power:	9895 Horsepower
Operator:	UNITED AIR LINES INC	Operating Certificate(s) Held:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	UALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Unknown	Visibility	
Lowest Ceiling:	Unknown	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	
Precipitation and Obscuration:			
Departure Point:	Kailua/Kona, HI (KOA) (A1); Los Angeles, CA (LAX) (A2)	Type of Flight Plan Filed:	
Destination:	SFO International Airport, CA (SFO) (A1); SFO International Airport, CA (SFO) (A2)	Type of Clearance:	IFR (A1); IFR (A2)
Departure Time:		Type of Airspace:	

Airport Information

Airport:	SAN FRANCISCO INTL SFO	Runway Surface Type:	
Airport Elevation:	13 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	Unknown
Runway Length/Width:		VFR Approach/Landing:	

Wreckage and Impact Information (A1)

Crew Injuries:	6 None	Aircraft Damage:	Minor
Passenger Injuries:	157 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	163 None	Latitude, Longitude:	37.615276,-122.389999

Wreckage and Impact Information (A2)

Crew Injuries:	5 None	Aircraft Damage:	Substantial
Passenger Injuries:	137 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	142 None	Latitude, Longitude:	37.615276,-122.389999

Administrative Information

Investigator In Charge (IIC): Ward, Effie Lorenda

Additional Participating Persons:

Original Publish Date: February 24, 2022

Last Revision Date:

Investigation Class: [Class 4](#)

Note: This accident report documents the factual circumstances of this accident as described to the NTSB.

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=100018>

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](#).