



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Orlando, Florida	Accident Number:	ERA22LA027
Date & Time:	October 22, 2021, 17:50 Local	Registration:	N925DR
Aircraft:	Embraer EMB500	Aircraft Damage:	Substantial
Defining Event:	Loss of control on ground	Injuries:	4 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was landing the light jet with a right quartering tailwind. He stated that only the right brake activated when he applied the brakes during the landing roll. The airplane veered right so he released the brake pressure and used left rudder pressure to steer the airplane back toward the centerline. The airplane turned “aggressively” to the left, the right wing rose, and the pilot chose to continue into the grass rather than risk overcontrolling the airplane. The right wing impacted terrain, resulting in substantial damage, and the airplane came to rest upright perpendicular to the landing runway. One of the passengers stated that the airplane was “fishtailing” before it continued off the runway into the grass.

The airplane’s flight data recorder showed an increase in right brake pressure and right brake pedal position starting 8 seconds after touchdown, with no corresponding increase in left brake pressure or pedal position, consistent with application of right brake only. Upon application of the right brake, the airplane entered a series of lateral accelerations, yawing right and left, consistent with the “fishtailing” described by the passenger; then entered a left yaw that continued until the end of the recorded data. No warnings or brake fault indications were recorded, and the brake control unit operated nominally during postaccident testing. The pilot reported that he did not customarily apply brakes during the landing roll when adequate runway was available to let the airplane decelerate.

Based on the available information, it is likely that the pilot inadvertently applied right brake during the landing roll, which resulted in a loss of directional control and subsequent runway excursion.

Probable Cause and Findings

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

The pilot's inadvertent application of the right brake during the landing roll, which resulted in a loss of directional control and a subsequent runway excursion.

Findings

Aircraft	Directional control - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Landing-landing roll	Loss of control on ground (Defining event)
Landing-landing roll	Runway excursion

On October 22, 2021, at 1750 eastern daylight time, an Embraer EMB-500 airplane, N925DR, was substantially damaged when it was involved in an accident in Orlando, Florida. The airline transport pilot and four passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that he completed a stable RNAV/GPS approach to a landing on runway 36L at Orlando International Airport (MCO). He had lowered a wing and was using the rudder to compensate for the crosswind. After touchdown, he applied brakes, but “only the right brake activated,” and the airplane’s nose went to the right. He then released the brakes and stated that he “may still have had a little left rudder in from the crosswind landing.” The airplane “came aggressively” back to its left, and the right wing began to lift. The pilot then decided to complete the landing roll into the grass rather than risk over-controlling the airplane by trying to remain on the runway.

The pilot stated that he asked for a “wind check” before landing and was told the wind was from 120° at 14 knots (kts). He said that the airplane landed on the runway centerline, after which he applied the brakes. He added, “[The airplane] Pulled to the right. Released brakes. Stepped on left rudder to come back towards centerline. Over corrected.” The pilot stated that, as he tried to steer the airplane toward the runway centerline, the wing was “lifted by wind.” He “eased up on the controls” and the airplane departed the left side of the runway.

The pilot further reported that he did not customarily apply brakes after touchdown, and if there was adequate runway available, he would “let the airplane roll out” and add brakes after it had slowed. He stated that, during the accident landing, he “got on the brakes pretty soon, and I don’t know why I did that.”

One passenger described the airplane “rocking back and forth aggressively” after landing. Another passenger stated that it felt like the airplane was “fishtailing” before it departed the runway surface.

After departing the runway, the airplane impacted a sign, dragged the right wing, and ultimately came to rest upright facing perpendicular to the landing runway, resulting in substantial damage to the right wing.

The pilot reported having 26,000 total hours of flight experience, of which 80 hours were in the accident airplane make and model.

Examination of the airplane's maintenance records revealed that its most recent continuous airworthiness program inspection was completed October 17, 2021, at 1,767.3 total aircraft hours.

The airplane's combination cockpit voice recorder/flight data recorder and components and modules of the braking system were retained for further examination. Data downloaded from the flight recorder revealed the airplane touched down at 87 kts airspeed. Lateral acceleration deviations were recorded shortly after touchdown, before any displacement of the brake pedals occurred. As the airplane slowed, about 8 seconds after touchdown, right brake pressure increased, with corresponding changes to the right brake pedal position. Lateral accelerations to the right and left were recorded beginning about the time of the right brake input, before the airplane yawed left and continued to yaw left until the end of the data. No warnings or cautions were recorded.

The manufacturer's Functional Test Instructions were followed when testing the brake control unit (BCU), and that the BCU passed all tests. Download of the BCU's non-volatile memory revealed there was "no unusual braking behavior or issues with the BCU at the time of the incident."

The recorded wind at 2153 (about 3 minutes after the accident) was from 090° at 12 kts, gusting to 16 kts, which would have resulted in a 90° crosswind for the landing runway. The 120°, 14-kt wind reported to the pilot just before the accident would have resulted in a right quartering tailwind, with a tailwind component of about 7 kts and a crosswind component of about 12 kts. The airplane's maximum demonstrated crosswind component was 17 kts (this value is not considered to be limiting), and its maximum allowed takeoff and landing tailwind component was 10 kts.

Pilot Information

Certificate:	Airline transport; Private	Age:	66, 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:	
Instructor Rating(s):	Airplane multi-engine	Toxicology Performed:	
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	June 1, 2021
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	26000 hours (Total, all aircraft), 80 hours (Total, this make and model), 10000 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Embraer	Registration:	N925DR
Model/Series:	EMB500	Aircraft Category:	Airplane
Year of Manufacture:	2009	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	50000059
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	October 17, 2021 Continuous airworthiness	Certified Max Gross Wt.:	9766 lbs
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:	1766.2 Hrs as of last inspection	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	C126 installed, activated, did not aid in locating accident	Engine Model/Series:	PW617F-E
Registered Owner:	Scout About, LLC	Rated Power:	1820 Lbs thrust
Operator:	Scout About, LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night/bright
Observation Facility, Elevation:	KMCO,95 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	21:53 Local	Direction from Accident Site:	270°
Lowest Cloud Condition:	Scattered / 6000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	12 knots / 16 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	90°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.97 inches Hg	Temperature/Dew Point:	30°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Charleston, SC (CHS)	Type of Flight Plan Filed:	IFR
Destination:	Orlando, FL	Type of Clearance:	IFR
Departure Time:	16:47 Local	Type of Airspace:	Class B

Airport Information

Airport:	ORLANDO INTL MCO	Runway Surface Type:	Asphalt;Concrete
Airport Elevation:	96 ft msl	Runway Surface Condition:	Dry
Runway Used:	18R/36L	IFR Approach:	RNAV
Runway Length/Width:	12004 ft / 200 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	28.429389,-81.309(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	Joseph Gramzinski; FAA/FSDO; Orlando, FL Daniel Marimoto; Embraer; Ft. Lauderdale, FL Daniel Barbosa Amancio; CENIPA; Brasilia
Original Publish Date:	June 22, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=104154

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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](#).