Aviation Investigation Final Report

Location:	Sacramento, California	**Incident Number:**	WPR10IA430
Date & Time:	August 26, 2010, 12:51 Local	**Registration:**	N590JB
Aircraft:	Airbus A320-232	**Aircraft Damage:**	Minor
Defining Event:	Miscellaneous/other	**Injuries:**	7 Minor, 84 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

Upon touchdown and with the first officer as the pilot flying, the airplane rapidly decelerated. After touchdown, air traffic control tower personnel notified the flight crew that smoke and sparks were coming from the airplane's main landing gear. The captain took control of the airplane and maintained directional control as it abruptly came to stop about 2,000 feet from the touchdown point. Postaccident examination of the airplane revealed that all four main landing gear tires were deflated and showed evidence of being locked on touchdown and that the main wheel rims were ground down. According to recorded digital flight data, the parking brake engaged about 5,116 mean sea level and remained engaged throughout the remainder of the flight and landing roll. The data also indicated that the speed brake was activated about 4 seconds before the parking brake. The speed brake lever is on the left side of the center console near the parking brake switch, which is at the bottom center of the console. The first officer stated that he activated the speed brake. It is likely that the first officer inadvertently activated the parking brake at the same time.

The flight crew stated that they were unaware of any indications or warnings related to the parking brake system during flight. The airplane's Electronic Centralized Aircraft Monitoring (ECAM) system should alert the flight crew when the parking brake is engaged in flight. However, after the accident, the first officer stated that he selected and held down the ECAM emergency cancel pushbutton for several seconds and that this was his typical procedure to preempt the autopilot disconnect audio. This action also terminated, in part, most of the visual alert indications associated with the in-flight parking brake activation. (The alerts would appear in the cancelled caution field on the status page and could be recalled, if necessary.) The operator's procedures state to only use the ECAM emergency cancel pushbutton to suppress spurious master cautions. A review of the airplane's cockpit voice recorder transcript revealed no audible autopilot disconnect or parking brake activation warnings. Examination of the airplane's parking brake and ECAM revealed no mechanical malfunctions or failures that would have precluded normal operation. If the first officer had not cancelled out most of the visual alert indications associated with the in-flight parking brake activation, it is likely that a visual warning would have alerted the flight crew to the in-flight parking brake activation.

Probable Cause and Findings

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

The first officer's inadvertent activation of the parking brake in flight, which led to the airplane abruptly stopping and all four of its main landing gear tires deflating, and his use of a nonstandard procedure to cancel the airplane's monitoring alert system.

Findings

Personnel issues	Use of policy/procedure - Copilot
Personnel issues	Incorrect action selection - Copilot

Factual Information

History of Flight

Approach	Miscellaneous/other (Defining event)
Landing-landing roll	Miscellaneous/other

On August 26, 2010, about 1251 Pacific daylight time, an Airbus 320-232, N590JB, experienced an abnormal landing at the Sacramento International Airport (SMF), Sacramento, California. During touchdown and landing rollout on runway 16R, the airplane rapidly decelerated; the main landing gear tires blew out, and a minor tire-related fire erupted. All of the airplane's occupants, emergency evacuated by use of the cabin door slides. The airplane sustained minor damage. The two airline transport pilots, three flight attendants and 79 passengers were not injured. Seven passengers received minor injuries during the evacuation process. The airplane was registered to and operated by JetBlue Airways as flight number 262, under the provisions of Title 14 Code of Federal Regulations Part 121. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed. The scheduled domestic passenger flight originated about 1141 from the Long Beach Airport, Long Beach, California.

According to the flight crew, the flight and approach to runway 16R were normal. The first officer was the pilot flying. Upon touchdown, the airplane began a rapid deceleration, and the first officer remarked to the captain that it felt like a main landing gear tire blew out. About this time, air traffic control tower personnel reported observing sparks and smoke in the area of the main landing gear. The captain took control of the airplane and maintained directional control as the airplane came to a stop about 2,000 feet from its touchdown point. The captain directed the first officer to initiate the Quick Reference Checklist (QRC) for ground evacuation, up to the evacuation decision point. At that time, air traffic control tower personnel confirmed smoke and fire were still visible around the main landing gear. Based on this information the captain elected to evacuate the airplane. Crash fire rescue personnel and equipment responded to the airplane, which was stopped on the runway. According to the flight crew and flight attendants, a swift and orderly evacuation was performed via emergency evacuation slides at both the forward main cabin doors and the rear left door. The rear right door was not used since a flight attendant observed smoke in the vicinity.

The airplane was subsequently examined by the operator and Federal Aviation Administration (FAA) personnel. Airplane damage was limited to four deflated main landing gear tires and the wheel rims were ground down. The main landing gear tires showed evidence of being locked on touchdown. Ground damage was limited to minor grazing of the runway's surface.

The airplane's Digital Flight Data Recorder (DFDR) and Cockpit Voice Recorder (CVR) were removed for analysis. The DFDR was examined by the operator and the National Transportation Safety Board (NTSB). According to the airplane's recorded flight data, the parking brake had become engaged in flight during the landing approach at approximately 5,116 feet mean sea level, and remained engaged throughout the remainder of the flight and landing roll. The parking brake activation occurred about the same time the autopilot was disconnected. The downloaded data indicated that the airplane was being configured with speed brakes about 4 seconds prior to the parking brake activation. The first officer

stated that he activated the speed brakes. The airplane controls for the speed brake and parking brake are located in the center console in the near vicinity of each other. The speed brake lever is on the left side of the console and is activated by pulling the lever. The parking brake switch is on the bottom center of the console and is activated by pulling and rotating the switch. The CVR was examined by the NTSB Vehicle Recorder Division. The airplane's CVR revealed no sounds of the associated warning audio for the parking brake activation or autopilot disconnect. The CVR did reveal sounds captured around the time of the parking activation, however, the source of the sounds proved to be inconclusive. Non-essential communication existed during the sterile cockpit portion of the descent and approach.

During interviews with the flight crew, neither pilot recalled any abnormal indications or cockpit warnings associated with the parking brake system prior to landing. The Electronic Centralized Aircraft Monitoring (ECAM) system is designed to monitor and advise the flight crew of the airplane's status. According to the manufacturer, if the parking brake is engaged in flight, the ECAM illuminates the master caution light, a single chime audio associated with the master caution light is given after a 3 second delay, and a parking brake on advisory message is presented. At 800 feet above ground level (agl), the alerts associated with the parking brake selected on in flight, are reactivated by the ECAM, in the event the alert or master caution was cleared by the flight crew. The applicable hydraulic system also provides an indication that the parking brake was activated in flight by the braking pressure indicators becoming operational. However, normal checklists do not require an in flight check of the brake pressure indicators.

The operator performed an examination and functional test of the airplane's parking brake system and central warning systems in accordance with the manufacturer's maintenance manual, with no abnormalities noted. The parking brake control switch was also functionally checked by the operator with no abnormalities noted. A vendor conducted an examination and breakdown of the parking brake control valve and control switch with no abnormalities noted.

On a follow up interview, the first officer described his personal technique where he would preempt the autopilot disconnect audio by selecting the ECAM emergency cancel pushbutton prior to disconnecting the autopilot and would hold it for several seconds afterwards. The autopilot disconnect warning audio (cavalry charge) is temporary and last a maximum of 1.5 seconds, if the autopilot is disengaged using standard procedures. Selection of the ECAM emergency cancel pushbutton would terminate the autopilot disconnect audio and any other present caution (master caution lights, ECAM alert message) for the rest of the flight. The alert would appear in the cancelled caution field on the status page and could be recalled if necessary. The operator's procedure has a note to use the ECAM emergency cancel pushbutton only for spurious master cautions.

According to the manufacturer, if the ECAM emergency cancel pushbutton is selected prior to the parking brake on alert being displayed; the master caution light and single chime associated with the parking brake on alert would be inhibited. In addition, at 800 feet agl, the "parking brake on" alert message and master caution would not be reactivated. The ECAM emergency cancel pushbutton is not a parameter recorded by the DFDR.

Pilot Information

Certificate:	Airline transport	**Age:**	49,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:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	August 3, 2010
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 31, 2009
Flight Time:	8716 hours (Total, all aircraft), 4397 hours (Total, this make and model), 4874 hours (Pilot In Command, all aircraft), 240 hours (Last 90 days, all aircraft), 79 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	43,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; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	July 13, 2010
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	September 17, 2009
Flight Time:	9100 hours (Total, all aircraft), 2217 hours (Total, this make and model), 5264 hours (Pilot In Command, all aircraft), 279 hours (Last 90 days, all aircraft), 91 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus	**Registration:**	N590JB
Model/Series:	A320-232	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	2231
Landing Gear Type:	Retractable - Tricycle	**Seats:**	160
Date/Type of Last Inspection:	August 26, 2010 Continuous airworthiness	**Certified Max Gross Wt.:**	170735 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:	25986 Hrs at time of accident	**Engine Manufacturer:**	IAE
ELT:	C126 installed, not activated	**Engine Model/Series:**	V2527-A5
Registered Owner:	JETBLUE AIRWAYS CORP	**Rated Power:**	25000 Lbs thrust
Operator:	JETBLUE AIRWAYS CORP	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	YENA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SMF,27 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	215°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.85 inches Hg	**Temperature/Dew Point:**	27°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Long Beach, CA (LGB)	**Type of Flight Plan Filed:**	IFR
Destination:	Sacramento, CA (SMF)	**Type of Clearance:**	IFR
Departure Time:	11:41 Local	**Type of Airspace:**	

Airport Information

Airport:	Sacramento International SMF	**Runway Surface Type:**	Asphalt
Airport Elevation:	27 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16R	**IFR Approach:**	ILS;Visual
Runway Length/Width:	8600 ft / 150 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	Minor
Passenger Injuries:	7 Minor, 79 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	7 Minor, 84 None	**Latitude, Longitude:**	38.695556,-121.590835(est)

Administrative Information

Investigator In Charge (IIC):	Pollack, Wayne
Additional Participating Persons:	Michael R Cartelli; Federal Aviation Administration; Garden City, NY Jacob Hillery; JetBlue Airways; Forest Hills, NY
Original Publish Date:	March 7, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=77100