



# National Transportation Safety Board

## Aviation Incident Data Summary

<b>Location:</b>	Atlanta, GA	<b>Incident Number:</b>	ENG09IA002
<b>Date &amp; Time:</b>	01/02/2009, 1028 EST	<b>Registration:</b>	N864DA
<b>Aircraft:</b>	BOEING 777	<b>Injuries:</b>	257 None
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

### Analysis

The Boeing 777 airplane experienced a contained fan blade fracture in the No. 2, right, engine, a Rolls-Royce plc RB.211 Trent 895-17 turbofan, during the takeoff roll at the Hartsfield Jackson Atlanta International Airport. The examination of the fan blade revealed it had fractured from a fatigue crack that had initiated at the intersection of the convex side aft corner of the shear key slot and bedding flank. The examination of the fan blade also revealed the plasma spray coating was deteriorated and the dry film lubricant was almost completely gone. A survey by the engine manufacturer of the operator's 777 engine usage indicated that because of the loads and lengths of the flights, the operator was operating their Trent 895-17 engines at higher thrust levels with correspondingly high fan rotational speeds, which were still within the engine's operating limits, than any other operator. The survey also indicated the operator was operating its 777 and Trent engines significantly more hours per cycle than any other Trent 895 operator. An analysis by the engine manufacturer indicated that the blade fracture was caused by a combination of the breakdown of the lubrication system and residual fatigue life usage in the blade root following the last overhaul coupled with the high operating stresses in the fan blade from the high thrust settings.

### Flight Events

Takeoff-rejected takeoff - Powerplant sys/comp malf/fail

### Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The fan blade fractured due to a fatigue crack that was the result of the combination of the breakdown of the fan blade lubrication system and residual fatigue life usage following the last overhaul of the fan blade. Contributing to the fracture was the inadequate lubrication schedule established by the engine manufacturer that was not reflective of the operator's use of the engine.

### Findings

Aircraft-Aircraft power plant-Engine (turbine/turboprop)-Compressor section-  
Fatigue/wear/corrosion - C  
Organizational issues-Development-Design-Task design-Manufacturer - F  
Organizational issues-Support/oversight/monitoring-Oversight-Oversight of maintenance-  
Manufacturer - F

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	BOEING	<b>Registration:</b>	N864DA
<b>Model/Series:</b>	777 232	<b>Engines:</b>	2 Turbo Fan
<b>Operator:</b>	Delta Air Lines	<b>Engine Manufacturer:</b>	Rolls-Royce
<b>Air Carrier Operating Certificate:</b>	Flag carrier (121)	<b>Engine Model/Series:</b>	Trent 895-17
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

## Meteorological Information and Flight Plan

<b>Observation Facility, Elevation:</b>		<b>Weather Information Source:</b>	Unknown
<b>Conditions at Accident Site:</b>		<b>Lowest Ceiling:</b>	
<b>Condition of Light:</b>		<b>Wind Speed/Gusts, Direction:</b>	
<b>Temperature:</b>		<b>Visibility:</b>	
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Atlanta, GA (KATL)	<b>Destination:</b>	Tokyo Narita (NRT)

## Airport Information

<b>Airport:</b>	Atlanta International Airport (KATL)	<b>Runway Surface Type:</b>	Asphalt
<b>Runway Used:</b>		<b>Runway Surface Condition:</b>	Dry
<b>Runway Length/Width:</b>			

## Wreckage and Impact Information

<b>Crew Injuries:</b>	15 None	<b>Aircraft Damage:</b>	Minor
<b>Passenger Injuries:</b>	242 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Gordon J Hookey	<b>Adopted Date:</b>	10/09/2012
<b>Investigation Docket:</b>	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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