



# National Transportation Safety Board Aviation Incident Data Summary

<b>Location:</b>	CHICAGO, IL	<b>Incident Number:</b>	CHI95IA142
<b>Date &amp; Time:</b>	05/01/1995, 1120 CDT	<b>Registration:</b>	N1811U
<b>Aircraft:</b>	MCDONNELL DOUGLAS DC10-10	<b>Injuries:</b>	192 None
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

## Analysis

The flightcrew reported that during the application of takeoff power, when the throttles were in approximately the vertical position, the numbers 1 and 3 engines were indicating approximately 70% N1. The number 2 engine was indicating about 48% N1 and not accelerating. They heard a 'crack' and aborted the takeoff. Examination of the engine revealed that the low pressure turbine (LPT) stage one disk had separated from the LPT rotor at the stage one to two flange joint. Seven intact toroid bolts and sets of associated hardware were recovered. No evidence of fatigue cracking or corrosion (pitting) was noted on any of the bolt pieces recovered from the engine. The shank of one of the toroid bolts exhibited significant damage. The lug arm, used for safeying the bolt, exhibited relatively minor damage. Examination of several of the lug arms revealed 'noticeable wear patterns' and 'crack arrest positions indicative of fatigue cracking.' Statements by UAL maintenance personnel indicate failures of the toroid bolt safeties are occasionally discovered when the engines are disassembled for major overhaul.

## Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this incident to be: failure of the safety wire and/or safety wire lug arm on one of the stage one to two disk flange bolts due to an inadequate safeying method.

## Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF  
Phase of Operation: TAKEOFF - ABORTED

### Findings

1. 1 ENGINE
2. (C) TURBINE ASSEMBLY,AIR SEAL - DISCONNECTED
3. (C) PROCEDURE INADEQUATE - MANUFACTURER

## Pilot Information

<b>Certificate:</b>	Airline Transport; Flight Instructor; Flight Engineer	<b>Age:</b>	56
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Instrument Rating(s):</b>	Airplane
<b>Other Aircraft Rating(s):</b>	None	<b>Instructor Rating(s):</b>	
<b>Flight Time:</b>	19011 hours (Total, all aircraft), 2909 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	MCDONNELL DOUGLAS	<b>Registration:</b>	N1811U
<b>Model/Series:</b>	DC10-10 DC10-10	<b>Engines:</b>	3 Turbo Jet
<b>Operator:</b>	UNITED AIRLINES	<b>Engine Manufacturer:</b>	CFM
<b>Operating Certificate(s) Held:</b>	Flag carrier (121)	<b>Engine Model/Series:</b>	CF6-6
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	ORD, 668 ft msl	<b>Weather Information Source:</b>	Weather Observation Facility
<b>Lowest Ceiling:</b>	None / 0 ft agl	<b>Wind Speed/Gusts, Direction:</b>	15 knots / 24 knots, 70°
<b>Temperature:</b>	11°C	<b>Visibility</b>	15 Miles
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	, IL (ORD)	<b>Destination:</b>	WASHINGTON, DC (IAD)

## Airport Information

<b>Airport:</b>	O'HARE INTERNATIONAL (ORD)	<b>Runway Surface Type:</b>	Asphalt
<b>Runway Used:</b>	9L	<b>Runway Surface Condition:</b>	Dry
<b>Runway Length/Width:</b>	7967 ft / 150 ft		

## Wreckage and Impact Information

<b>Crew Injuries:</b>	12 None	<b>Aircraft Damage:</b>	Minor
<b>Passenger Injuries:</b>	180 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Latitude, Longitude:</b>			

## Administrative Information

Investigator In Charge (IIC): WESLEY M ROBBINS, Adopted Date: 04/18/1996

Investigation Docket: 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 [pubinq@ntsb.gov](mailto:pubinq@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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