



National Transportation Safety Board Aviation Incident Final Report

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| Location: | CHICAGO, IL | Incident Number: | CHI951A028 |
| Date & Time: | 11/02/1994, 0920 CST | Registration: | N631US |
| Aircraft: | BOEING 747-251B | Aircraft Damage: | Minor |
| Defining Event: | | Injuries: | 3 None |

Flight Conducted Under: Part 91: General Aviation - Positioning

Analysis

THE FLT CREW DISCONNECTED THE NUMBER ONE ENG CONSTANT SPEED DRIVE (CSD) DURING A FLT ON THE DAY PRIOR TO THIS INCIDENT WHEN ITS OIL PRESSURE LIGHT ILLUMINATED. DUE TO OTHER, UNRELATED MAINTENANCE, THE AIRPLANE'S NEXT REVENUE FLT WAS CANCELLED. SECOND SHIFT MECHANICS WERE ASSIGNED MAINTENANCE ON THE AIRPLANE. THE MECHANICS DECIDED TO TROUBLESHOOT THE UNIT. THE CSD WAS MECHANICALLY RECOUPLED AND THE ENG WAS STARTED. AFTER THE ENG START, THE START VALVE LIGHT FAILED TO GO OUT AND THE ENGINE WAS SHUT DOWN. A MECHANIC REMOVED THE MAIN CSD WIRING HARNESS CANNON PLUG TO HELP WITH THE TROUBLE SHOOTING PROCESS. THE START VALVE WAS REPLACED AND THE ENG WAS RUNUP. THE CSD CANNON PLUG WAS NOT CONNECTED AT THE CONCLUSION OF THE ENG RUNUP. AFTER SHUTDOWN THE START VALVE CHANGE WAS ENTERED INTO THE AIRPLANE MAINTENANCE RECORDS. THE MECHANIC WHO RECOUPLED THE CSD INFORMED THE LEAD MECHANIC OF HIS ACTION BEFORE HE LEFT FOR THE DAY. ACCORDING TO THE COMPANY, THE THIRD SHIFT MECHANICS DID NOT HAVE ENOUGH TIME TO CHANGE THE CSD. THE NUMBER ONE ENG WAS '...CLOSED UP [AND] THE AIRCRAFT WAS DISPATCHED.' DURING TAXI FROM LANDING THE CSD CAUGHT FIRE.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: inattentive maintenance service of the airplane by the mechanic who failed to disengage the constant speed drive (CSD) after the engine runup had been completed. A factor in this incident was the lead mechanic not performing maintenance record keeping after being informed that the CSD had been recoupled.

Findings

Occurrence #1: FIRE

Phase of Operation: TAXI - FROM LANDING

Findings

1. CONSTANT SPEED DRIVE - FIRE
2. (C) MAINTENANCE,SERVICE OF AIRCRAFT/EQUIPMENT - INATTENTIVE - COMPANY MAINTENANCE PERSONNEL
3. (F) MAINTENANCE,RECORDKEEPING - NOT PERFORMED - COMPANY MAINTENANCE PERSONNEL

Factual Information

On November 2, 1994, at 0920 central standard time, a Boeing 747- 251B, N631US, operated by Northwest Airlines, Incorporated, of Minneapolis, Minnesota, and piloted by an airline transport rated flight crew, received minor damage during taxi in from a landing at the Chicago O'Hare International Airport, Chicago, Illinois. The number one engine generator's constant speed drive was on fire and was extinguished by ramp personnel. The 14 CFR Part 91 positioning flight had been operating on an IFR flight plan. Visual meteorological conditions prevailed at the time of the incident. No injuries were reported by the three flight crew members on the airplane. The flight departed Detroit, Michigan, at 0902 eastern standard time (est).

According to company records, the number one engine's constant speed drive (CSD) was disconnected from service during a flight on November 1, 1994, when its oil pressure light illuminated. A subsequent revenue flight was canceled due to another unrelated maintenance discrepancy. A lead mechanic assigned second shift mechanics to work on the N631US. A replacement CSD was scheduled to arrive after 2400 est on November 1, 1994. The mechanics decided to troubleshoot the CSD.

One of the mechanics said the CSD check is done during an engine runup. He said the CSD was mechanically recoupled before starting the number one engine. After the engine started, its cockpit start valve light failed to go out and the engine was shut down. After replacement of the start valve the engine runup was performed. The engine was shut down and the mechanics signed off the start valve change.

According to the company, a mechanic researched the fault isolation manual and decided that removal of the main CSD wiring harness cannon plug would help in the troubleshooting process. The cannon plug was removed from the CSD. The CSD had not arrived at the end of the second shift. The company's report on the incident states, "Based on MEL relief, the first day of deferral and down time required to replace the CSD, the engine was closed up, the aircraft was dispatched. The number one engine CSD had been mechanically recoupled, and the main harness disconnected, neither of which was documented."

The maintenance shift change carry-over records showed the CSD as being on deferred maintenance. The records do not address the CSD recoupling by the mechanic. These records are reviewed by the lead mechanic. The second shift mechanic related to the CSD reengagement said, he told the lead mechanic what he had done. He said that the lead mechanic told him that he would have the next shift take care of the CSD change.

An on-scene investigation revealed that the CSD's exterior was fire damaged. Wiring insulation attached to the CSD, and within 12 inches of its exterior was melted. Some smaller wires had completely melted through. The CSD's mechanical recoupling handle was found in the "IN" position, confirming earlier recoupling action. The CSD's engine nacelle access door was warped outward and flame damaged. The interior of the nacelle next to, and around, the area of the CSD was partially melted and warped.

Pilot Information

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| Certificate: | Airline Transport | Age: | 51, Male |
| Airplane Rating(s): | Multi-engine Land | Seat Occupied: | Left |
| Other Aircraft Rating(s): | None | Restraint Used: | Seatbelt, Shoulder harness |
| Instrument Rating(s): | Airplane | Second Pilot Present: | Yes |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Unknown Unknown | Last FAA Medical Exam: | |
| Occupational Pilot: | | Last Flight Review or Equivalent: | |
| Flight Time: | 15000 hours (Total, all aircraft) | | |

Aircraft and Owner/Operator Information

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| Aircraft Make: | BOEING | Registration: | N631US |
| Model/Series: | 747-251B 747-251B | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Transport | Serial Number: | 23111 |
| Landing Gear Type: | Retractable - Tricycle | Seats: | 350 |
| Date/Type of Last Inspection: | 11/02/1994, Continuous Airworthiness | Certified Max Gross Wt.: | 820000 lbs |
| Time Since Last Inspection: | 1 Hours | Engines: | 4 Turbo Jet |
| Airframe Total Time: | 40562 Hours | Engine Manufacturer: | P&W |
| ELT: | Not installed | Engine Model/Series: | JT9D-7R4 |
| Registered Owner: | 1ST NATL BANK OF BOSTON | Rated Power: | 50000 lbs |
| Operator: | NORTHWEST AIRLINES, INC. | Operating Certificate(s) Held: | Flag carrier (121) |
| Operator Does Business As: | NORTHWEST AIRLINES | Operator Designator Code: | NWAA |

Meteorological Information and Flight Plan

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| Conditions at Accident Site: | Visual Conditions | Condition of Light: | Not Reported |
| Observation Facility, Elevation: | , 0 ft msl | Distance from Accident Site: | 0 Nautical Miles |
| Observation Time: | 0000 | Direction from Accident Site: | 0° |
| Lowest Cloud Condition: | Unknown / 0 ft agl | Visibility | 0 Miles |
| Lowest Ceiling: | Unknown / 0 ft agl | Visibility (RVR): | 0 ft |
| Wind Speed/Gusts: | / | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | | Temperature/Dew Point: | |
| Precipitation and Obscuration: | | | |
| Departure Point: | DETROIT, MI (DTW) | Type of Flight Plan Filed: | Unknown |
| Destination: | CHICAGO, IL (ORD) | Type of Clearance: | |
| Departure Time: | 0902 EST | Type of Airspace: | |

Airport Information

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|----------------------|---------------------------|---------------------------|--|
| Airport: | CHICAGO O'HARE INTL (ORD) | Runway Surface Type: | |
| Airport Elevation: | 667 ft | Runway Surface Condition: | |
| Runway Used: | 0 | IFR Approach: | |
| Runway Length/Width: | | VFR Approach/Landing: | |

Wreckage and Impact Information

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|---------------------|--------|----------------------|-----------|
| Crew Injuries: | 3 None | Aircraft Damage: | Minor |
| Passenger Injuries: | N/A | Aircraft Fire: | On-Ground |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 3 None | Latitude, Longitude: | |

Administrative Information

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|-----------------------------------|--|--------------|------------|
| Investigator In Charge (IIC): | FRANK S GATTOLIN | Report Date: | 03/27/1995 |
| Additional Participating Persons: | RONALD KNIPP; SHILLER PARK, IL | | |
| Publish Date: | | | |
| 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 , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ . | | |

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).