



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Minneapolis, MN	<b>Accident Number:</b>	CHI01FA129
<b>Date &amp; Time:</b>	05/01/2001, 1437 CDT	<b>Registration:</b>	N9333
<b>Aircraft:</b>	Douglas DC-9-31	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	2 Minor, 42 None
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

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## Analysis

The airplane was substantially damaged when it was struck by an aircraft tug during passenger boarding. The aircraft was parked and was being prepared for departure. The driver of the tug was moving the vehicle into position in order to connect the aircraft tow bar in preparation for pushback. He said that when he placed the tug into gear, it lurched forward into the parked aircraft. He said that pieces of the aircraft protruded through the windshield of the vehicle and pinned him into his seat. He said that he was unable to shift the vehicle into reverse and his leg was pinned on the accelerator pedal. Other ground workers in the area attempted to shut off the tug's engine. The driver said that the vehicle continued to drive forward until the engine was finally shut off. During the event, the pilot of the aircraft had applied the brakes when he noticed the unplanned movement of the airplane. The aircraft was pushed backward about 30 feet causing damage to the nose section of the fuselage. Subsequent to the accident, the tug was placed on jacks and a check performed. During the check it was found that the normal engine shutoff switch would not shut the engine off if the engine was operated at high throttle settings. It was further discovered that at high throttle settings, the brake system was not able to stop the rotation of the drive wheels. No anomalies were found during this test that would explain the lurching described by the tug driver. The tug had been involved in a previous incident where an aircraft was damaged. A report of the previous incident showed that the tug lurched when the driver was attempting to move the tug into position to connect to the aircraft. The tug manufacturer does not have records of operational problems associated with that model tug. The manufacturer also said that they were not aware of a history of lurching problems concerning the model tug in question. It was found that the distance from the cab of the tug to the nose of a DC-9 aircraft when the tow bar is attached is 4 feet 2 inches.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The partial failure of the aircraft tug for undetermined reasons.

## Findings

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Occurrence #1: ON GROUND/WATER COLLISION WITH OBJECT  
Phase of Operation: STANDING - ENGINE(S) NOT OPERATING

### Findings

1. (C) AIRPORT EQUIPMENT,GROUND SUPPORT - FAILURE,PARTIAL
2. (C) REASON FOR OCCURRENCE UNDETERMINED

## Factual Information

On May 01, 2001, at 1437 central daylight time, a Douglas DC-9-31, N9333, operated by Northwest Airlines, Inc. as flight 682, was substantially damaged when it was struck by an aircraft tug during passenger boarding. The 14 CFR Part 121 flight was parked at gate D3 at the Minneapolis-St. Paul International/Wold-Chamberlain Airport, Minneapolis, Minnesota and was bound for the Philadelphia International Airport, Philadelphia, Pennsylvania. No injuries were reported by the 4 crewmembers or 38 passengers that had boarded the aircraft. The driver of the tug and a food service worker received minor injuries.

The aircraft was parked and was being prepared for departure by various ground workers including the tug driver and workers restocking the aircraft food supply. The driver of the tug said that he was moving the vehicle into position in order to connect the aircraft tow bar in preparation for pushback. He said that when he placed the tug into gear, it lurched forward into the parked aircraft. He said that pieces of the aircraft protruded through the windshield of the vehicle and pinned him into his seat. He said that he was unable to shift the vehicle into reverse and his leg was pinned on the accelerator pedal. Other ground workers in the area attempted to shut off the tug's engine. The driver said that the vehicle continued to drive forward until the engine was finally shut off. During the event, the pilot of the aircraft had applied the brakes when he noticed the unplanned movement of the airplane. The aircraft was pushed backward about 30 feet causing damage to the nose section of the fuselage. A food service worker was injured when he jumped from his vehicle which was parked next to the aircraft.

Subsequent to the accident, the tug was placed on jacks and a check performed. During the check it was found that the normal engine shutoff switch would not shut the engine off if the engine was operated at high throttle settings. It was further discovered that at high throttle settings, the brake system was not able to stop the rotation of the drive wheels. No anomalies were found during this test that would explain the lurching described by the tug driver. Subsequent to the testing, the throttle system of the tug was replaced as a precautionary measure by the airline.

During the course of the investigation, it was found that the tug had been involved in a previous incident where an aircraft was damaged. A report of the previous incident was obtained. The driver of the tug during the previous incident reported that the tug lurched when he was attempting to move the tug into position to connect to the aircraft.

The manufacturer of the tug said, during a telephone interview, that they do not have records of operational problems associated with that model tug. He also stated that he was not aware of a history of lurching problems concerning the model tug in question.

It was found that the distance from the cab of the tug to the nose of a DC-9 aircraft when the tow bar is attached is 4 feet 2 inches.

## Pilot Information

<b>Certificate:</b>	Airline Transport; Commercial	<b>Age:</b>	46, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Unknown	<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	09/22/2000
<b>Flight Time:</b>	9174 hours (Total, all aircraft), 6759 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Douglas	<b>Registration:</b>	N9333
<b>Model/Series:</b>	DC-9-31	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Transport	<b>Serial Number:</b>	47246
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	105
<b>Date/Type of Last Inspection:</b>	AAIP	<b>Certified Max Gross Wt.:</b>	108000 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo Jet
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Pratt & Whitney
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	JT8-9A
<b>Registered Owner:</b>	NORTHWEST AIRLINES INC	<b>Rated Power:</b>	14000 lbs
<b>Operator:</b>	NORTHWEST AIRLINES INC	<b>Operating Certificate(s) Held:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	NWAA

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MSP, 841 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	1445 CDT	Direction from Accident Site:	0°
Lowest Cloud Condition:	Scattered / 2500 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 8000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	80°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.15 inches Hg	Temperature/Dew Point:	25° C / 10° C
Precipitation and Obscuration:			
Departure Point:	MINNEAPOLIS, MN (MSP)	Type of Flight Plan Filed:	IFR
Destination:	PHILADELPHIA, PA (PHL)	Type of Clearance:	None
Departure Time:		Type of Airspace:	Unknown

## Airport Information

Airport:	MINNEAPOLIS-ST PAUL INTL/WOLD-(MSP)	Runway Surface Type:	Unknown
Airport Elevation:	841 ft	Runway Surface Condition:	Unknown
Runway Used:		IFR Approach:	Unknown
Runway Length/Width:		VFR Approach/Landing:	Unknown

## Wreckage and Impact Information

Crew Injuries:	4 None	Aircraft Damage:	Substantial
Passenger Injuries:	38 None	Aircraft Fire:	None
Ground Injuries:	2 Minor	Aircraft Explosion:	None
Total Injuries:	2 Minor, 42 None	Latitude, Longitude:	

## Administrative Information

Investigator In Charge (IIC):	John M Brannen	Report Date:	07/02/2002
Additional Participating Persons:	Patrick Schmitz; Northwest Airlines, Dept N7180; St. Paul, MN Bradley T Berntsen; FAA-Northwest Airlines CMO; Bloomington, MN Mark Bauman; Aircraft Mechanics Fraternal Association; Bloomington, MN		
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 <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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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](#).