Damage caused to airplane by light cover, McDonnell Douglas DC-9-51, December 27, 2000

Micro-summary: This McDonnell Douglas DC-9-51 was damaged after an in-ground light it rolled over failed, resulting in a pressurization failure and diversion.

Event Date: 2000-12-27 at 2033 EST

Investigative Body: National Transportation Safety Board (NTSB), USA

Investigative Body's Web Site: http://www.ntsb.gov/

Cautions:

1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).

2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. Your company's flight operations manual is the final authority as to the safe operation of your aircraft!

3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.

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National Transportation Safety Board NTSB ID: NYC01FA062 Aircraft Registration Number: N769NC										
FACTUAL REPORT		Occurr	one							
AVIATION Occurrence Type: Accident Investigated By: NTSB										
Location/Time										
Nearest City/Place	State		Zip Code	Local Time	Time Zone					
Jamaica	NY		11430	2033	EST					
Airport Proximity: On Airport	Dista	nce Fron	n Landing Facility:		Direction Fro	m Airpor	t:			
Aircraft Information Summary										
Aircraft Manufacturer			Model/Serie	S			Type of Aircraft			
McDonnell Douglas			DC-9-51				Airplane			
Sightseeing Flight: No			Air Medical T	ansport Flight: N	0					
Narrative										
Brief narrative statement of facts, conditions and circumstan HISTORY OF FLIGHT	ices pert	inent to the	e accident/incident:							
operated by Northwest Airlines Inc., as flight 1865, was substantially damaged during the takeoff roll from John F. Kennedy International Airport (JFK), Jamaica, New York. The 2 pilots, 3 flight attendants, and 22 passengers, were not injured. Night visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight destined for Detroit Metropolitan Airport, Detroit, Michigan. The scheduled passenger flight was conducted under 14 CFR Part 121. According to a representative from the operator, the airplane was on takeoff roll from runway 31L, full length, when at approximately 110 knots, the flightcrew heard a "bang." The pilot continued										
the takeoff and began a climb. Unable to pressurize the passenger cabin, the pilot elected to divert the flight to Newark International Airport, Newark, New Jersey, where the airplane landed uneventfully.										
According to a Federal Aviation Administration (FAA) inspector, about 5 minutes after the airplane took-off, a second airplane departed from runway 31L. The airplane reported to the air traffic control tower that they observed an object on the runway. The tower controller alerted the Port Authority of New York and New Jersey Operations Group of the object, who then dispatched airport personnel to investigate. When airport personnel arrived at the approach end of runway 31L, they found a cover from an in-ground light lying on the runway, broken in two pieces.										
FLIGHTCREW INFORMATION										
Captain										
The Captain held an airline transport pilot certificate with a rating for airplane multiengine land, and was type rated in the DC-9. His most FAA first class medical certificate was issued on August 17, 2000.										
First Officer										
The First Officer held an airline transport pilot certificate with a rating for airplane multiengine land, and was type rated in a Boeing 707, 720, and 737. His most recent FAA first class medical certificate was issued on April 20, 2000.										
AIRCRAFT INFORMATION										
A review of the airplane's ma	inter	nance	records did	not reveal any	v repetitive	discr	repancies related			

FACTUAL REPORT - AVIATION

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National Transportation Safety Board	NTSB ID: NYC01FA062										
FACTUAL REPORT	Occurrence Date: 12/27/2000										
AVIATION ETYBOR	AVIATION Ccurrence Type: Accident										
Narrative (Continued)											
to the pressurization system.											
AERODROME INFORMATION											
Runway 31L, was a 14,572-foot long, 150-foot wide, asphalt and concrete, grooved runway, with a displaced threshold of 3,323 feet.											
The light cover recovered on the runway was from an inset flashing light fixture, which was part of an in-ground, semi-flush mounted, medium intensity approach lighting system (MALSR), installed at the approach end of runway 31L in 1997. The lighting system included five separate light fixtures, located within the displaced threshold of runway 31L. The in-ground approach light fixtures were installed in the pavement by a contactor, working for the Port Authority of New York and New Jersey, on behalf of the FAA. The light fixtures were not operational at the time of the accident due to lack of FAA commissioning.											
According to a representative fr making the lighting system opera approved light fixtures to complete	ational also included the FA	A's lack of supplying additional									
According to the manufacturer of the lighting system, the semi-flush flashing light fixture was a high intensity flashing light, used in paved operational surfaces of a runway, as a guide for incoming pilots. They were weatherproof and designed to withstand rollover loads.											
The semi-flush flashing light consisted of a top casting and prism assembly, mirror-holding assembly, and a bracket and filter assembly. The top casting was held to a base mount by six, 1-inch, 3/8-16 threaded bolts, and 3/8 lock washers. The cover was estimated to weigh about 100 pounds.											
The limitations of the fixture were that "proper maintenance procedures must be adhered to the base must be kept reasonably free of water, and proper snow removal and runway clearing procedures must be employed."											
The manufacturer also warned, "snowplows can cause serious damage to the light objects."											
According to a representative from the JFK Airport Facilities Division, the last snow removal operations were conducted during the last snow season of 1999-2000. Contracted electricians conducted repairs and inspections of runway lighting facilities at varied intervals. The MALSR lighting fixtures installed at the departure end of runway 31L were not a part of a special maintenance program, due to their being non-operational. The contracted electricians would not be specifically sent to the fixtures to lift the cover and inspect the integrity of the securing bolts; however the electricians would visually check the units during the inspections. The runway was also inspected for debris and general condition on a daily basis, or on a Duty Manager shift change, in accordance with 14 CFR Part 139.											
WRECKAGE DESCRIPTION	WRECKAGE DESCRIPTION										
long, by 1-foot wide on the unders:	Examination of the airplane by an FAA inspector after the accident revealed a gash about 3 feet long, by 1-foot wide on the underside of the fuselage, aft of the passenger entry door. Damage was also observed to the right nose gear tire and two navigation antennas.										
Safety Board personnel examined the replaced the area where the af- cover. Examination of the MALS approximate 1-inch wide void area be	fected light fixture cover was is SR light fixtures revealed a la	nstalled with a new light fixture yer of epoxy glue, poured into an									

FACTUAL REPORT - AVIATION

National Transportation Safety Board	
FACTUAL REPORT	
AVIATION ETY BOR	

NTSB ID: NYC01FA062 Occurrence Date: 12/27/2000 Occurrence Type: Accident

Narrative (Continued)

Examination of the accident light fixture by Safety Board personnel, revealed that the six bolts utilized to attach the lighting assembly to the in-ground base were all sheared. The fracture surfaces on the bolts were smeared, consistent with low cycle fatigue fractures that occurred over a period of time. A black mark, consistent with a tire tread, was observed in the optical lighting well of the light fixture. An additional mark, also consistent with a tire tread, was observed on the underside of the light fixture.

ADDITIONAL INFORMATION

On December 29, JFK facility maintenance electricians inspected the remaining in pavement MALSR light fixtures on runway 31L. The electricians observed, "that while the castings were secured to the base cans, there were a number of 'loose' bolts in each of the remaining 4 fixtures."

The airplane was repaired and returned to service on December 29.

National Transportation Safety Board	NTS	B ID:	NYC0	1FA062							
FACTUAL REPORT											
AVIATION Occurrence Type: Accident											
Landing Facility/Approach Informat	tion										
Airport Name	Airpo	irport ID: Airport Elevation Runway Used Runway Length								nway Width	
John F. Kennedy International		JFK	ζ.	13 Ft	. MSL	311	-	1457:	2	15	0
Runway Surface Type: Asphalt; Concret	te							•		•	
Runway Surface Condition: Dry											
Type Instrument Approach: NONE											
VFR Approach/Landing: None											
Aircraft Information									1		
Aircraft Manufacturer McDonnell Douglas									Serial N 47757	Number 7	
Airworthiness Certificate(s): Transport											
Landing Gear Type: Retractable - Tricycle											
Homebuilt Aircraft? No Number of Seats: 131 Certified Max G					/t.		121000	LBS	Numbe	r of Engine	es: 2
Engine Type: Turbo Fan		Engine Manufacturer:Model/Series:P&WJT8D-17							ted Power: 5000 LBS		
- Aircraft Inspection Information											
Type of Last Inspection Date of Last Inspection Time Since Last Inspection Airframe Total Time											
AAIP Hours							Hours				
- Emergency Locator Transmitter (ELT) Information											
ELT Installed? No ELT Operated? ELT Aided in Locating Accident Site?											
Owner/Operator Information											
Registered Aircraft Owner	Street Address 5101 Northwest Dr.										
Northwest Airlines Inc.				City State MN							Zip Code 55111
	Street Address								199111		
Operator of Aircraft				Same as Reg'd Aircraft Owner							
Same as Reg'd Aircraft Owner										State	Zip Code
Operator Does Business As: Northwest Airlines Operator Designator Code: NWAA											
- Type of U.S. Certificate(s) Held:											
Air Carrier Operating Certificate(s): Flag Carrier/Domestic											
Operating Certificate:				Operator (Certific	ate:					
Regulation Flight Conducted Under: Part	121: Air Carrier										
Type of Flight Operation Conducted: Sche	eduled; Domestic	; Pas	senger	Only							
FACTUAL REPORT - AVIATION Page 2											

National Transportation	Safety Board	1	NTSB ID:	NYC01FA	062								
	FACTUAL REPORT Occurrence Date: 12/27/2000												
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AVIATION Occurrence Type: Accident												
			Occurrent	cc Type. A	Scident								
First Pilot Information					City					Stat		Date of Birth	Ago
	On File On File 39												Age
												On File	39
Sex: M Seat Occupied: Left Principal Profession: Civilian Pilot Certificate Number: On File													
Certificate(s): Airline Transport													
Airplane Rating(s): Multi-engine Land													
Rotorcraft/Glider/LTA: None													
Rotorcraft/Glider/LTA: None Instrument Rating(s): Airplane													
Instructor Rating(s): None	;												
Type Rating/Endorsement for Accident/Incident Aircraft? Yes Current Biennial Flight Review? 05/2000													
Medical Cert.: Class 1 Medical Cert. Status: Valid Medicalno waivers/lim. Date of Last Medical Exam: 08/2000													
- Flight Time Matrix	X All A/C This Make Airplane Airplane Airplane Night Instrument Actual Simulated Rotorcraft Glider Than Air												
Total Time	3746	3130											
Pilot In Command(PIC)		324											
Instructor													
Last 90 Days													
Last 30 Days													
Last 24 Hours													
Seatbelt Used? Yes	Seatbelt Used? Yes Shoulder Harness Used? Yes Toxicology Performed? No Second Pilot? Yes									es			
Flight Plan/Itinerary													
Type of Flight Plan Filed: IFF	२												
Departure Point State Airport Identifier Departure Time Time Zone								Time Zone					
Same as Accident/Incident Location JFK 2033 EST													
Destination State Airport Identifier													
Detroit MI DTW													
Type of Clearance: IFR													
Type of Airspace: Class E	3												
Weather Information													
Source of Briefing: Compa	iny												
Method of Briefing: Teletyp)e												
	-		FACTUAI	REPORT	- AVI	ATIO	N						Page 3

Currance Date: 12/27/2000 Occurrance Type: Accident Occurrance Type: Accident Work Elevation Time Time Zone WOF Elevation Time Direction From Accident Site: Time Zone WOF Elevation Time Direction From Accident Site: JK 2051 EST 13 FL MSL Condition: Tupe: Night: SkyLowest Cloud Condition: Clear FL AGL Visibility: 10 SM Attimete: 29.96 "Hg Temperature: -7° C Our Point: -13 °C Work Elevation: 320 Density Attitude: FL Mine Site: Visual Conditions Step: Visual Conditions Visibility (RVR): FL None Tome: Visibility: None Attractart Elevation: Visibility: None Attractart Elevation: None Coldent Information Attractart Elevation: None Coldent None Coldent Mine: Mine: York Attractart Elevation: None Colspan="4">Attractart Elevatio	Nationa	al Transportation Safety	Board	NTSB ID:	NYC01	FA062								
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Temperature: -7 °C Dew Point: -13 °C Wind Direction: 320 Density Altitude: Ft. Wind Speed: 12 Gusts: Weather Conditions at Accident Site: Visual Conditions Density Altitude: Ft. Wind Speed: 12 Gusts: Weather Conditions at Accident Site: Visual Conditions Density Altitude: Ft. Visibility (RVR): Ft. Visibility (RVV) SM Intensity of Precipitation: Restrictions to Visibility: None Intensity of Precipitation: Second Precipitation: Accident Information Aircraft Erre: None Aircraft Explosion None Second Precipitation: Second Precipitation: Classification: U.S. Registered/U.S. Soil I 1 1 - Injury Summary Matrix Fatal Serious Minor None TOTAL First Pilot I I 1 1 1 Second Pilot I I 1 1 Second Pilot I I I 1 Flight Engineer I I I I	Sky/Lowest Cloud Condition: Clear Ft. AGL Condition of Light: Night													
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				FACTUAL	REPO	RT - AV	IATION					F	Page 4	

National Transportation Safety Board	NTSB ID: NYC01FA062								
FACTUAL REPORT	Occurrence Date: 12/27/2000								
AVIATION ETYBON	Occurrence Type: Accident								
	Accident								
Administrative Information									
Investigator-In-Charge (IIC) Stephen M. Demko									
Additional Persons Participating in This Accident/Incid	ant Investigation:								
James A Keane Operations Manager The Port Authority of New York and New Jersey Jersey City, NJ									
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