Landing gear strut separation, Boeing 727-200, August 23, 1999

Micro-summary: The left main landing gear strut of this Boeing 727-200 separated during taxi.

Event Date: 1999-08-23 at 1910 EDT

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

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

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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!

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TRANSO									
National Transportation Safety Board	National Transportation Safety Board NTSB ID: IAD99IA059 Aircraft Registration Number: N926TS								
FACTUAL REPORT		Occurr	ence Date: 08/23	njury: No	ury: None				
AVIATION VETYBON	AVIATION Occurrence Type: Incident Investigated By: NTSB								
Location/Time									
Nearest City/Place	State		Zip Code	Local Time	Time Zone				
WASHINGTON	DC	20001 1910 EDT							
Airport Proximity: On Airport Distance From Landing Facility: Direction From Airport:									
Aircraft Information Summary									
Aircraft Manufacturer Model/Series Type of Aircraft									
Boeing 727-200 Airplane									
Sightseeing Flight: No Air Medical Transport Flight: No									
Narrative									
On August 23, 1999, at 1910 Eastern Daylight Time, a Boeing 727-200, N926TS, operated by US Airways Shuttle, received minor damage when the main landing gear side strut separated during taxi at the Ronald Reagan National Airport (DCA), Washington, DC. The three certificated flight crewmembers, 5 cabin attendants, and 163 passengers were not injured. Visual meteorological conditions prevailed for the scheduled passenger flight that originated at LaGuardia Airport (LGA), New York, New York, about 1800. An IFR flight plan was filed for the flight conducted under 14 CFR Part 121.									
In a written statement, the Captain said:									
"The entire flight was routine until we exited the landing runway at DCA. The aircraft was slowed and a gradual right turn off Runway 18 at "F" taxiway was made. As the aircraft was being reconfigured at my request, an intermittent aural warning sounded. This was accompanied by alternate flashing right main gear green and red warning lights. Additionally, there was a pulsating thump occurring simultaneously with the green and red lights. The aircraft was stopped. Air Traffic and Company personnel were notified that the aircraft would not be moved until it was inspected. Maintenance personnel advised me that there was a broken side strut on the right main landing gear."									
The flight crew stopped the airplane and de-planed passengers on the taxiway.									
Examination of the right main landing gear revealed that the side strut assembly was separated from the main shock strut and that the gear door was open. The threaded portion of the main strut attachment clevis was separated from the side strut assembly. The clevis remained attached to the main shock strut.									
The clevis bolt was dry, corroded, and the threads were broken and stripped. There was no evidence of lubrication on the clevis bolt. The retaining nut and the lock nut inside the lower end of the side strut were also dry, corroded, and displayed corresponding damaged and stripped threads inside the lock nut.									
The right main landing gear squat switch was broken, two torque tubes were bent, and honeycomb wheel-well fairing material was damaged.									
Examination of maintenance records revealed that both the left and right side strut assemblies were overhauled in July 1996. At that time, the overhaul facility documented compliance with Boeing Service Bulletin 727-32-0338 Option 3.									
The side strut and the attachment clevis were removed from the airplane and taken to the Safety Board Materials Laboratory for further examination.									
FACTUAL REPORT - AVIATION Page 1									

National Transportation Safety Board	NTSB ID: IAD99IA059								
FACTUAL REPORT	Occurrence Date: 08/23/1999								
AVIATION ETYBOR	Occurrence Type: Incident								
Narrative (Continued)	•	·							
A Safety Board metallurgist exam corresponding left main landing gea	ined the damaged right main land r components for comparison. Ac	ing gear components, and then the cording to his report:							
"The threads on the upper end of nut were damaged and apparently s remainder of the side strut lower so	f the clevis and the correspondi tripped over each other, allowin egment."	ng threads on the clevis assembly g the clevis to separate form the							
The report further described seven that corrosion deposits covered caked around the upper side of the o	re corrosion damage to the threa any undamaged fracture feature clevis assembly nut.	ds of the clevis and the nut, and s. Partially hardened grease was							
Disassembly and examination of around the undamaged threads of loose inside the retainer nut assembly	the left main landing gear stru the clevis and the clevis assem bly.	t revealed fresh grease collected bly nut. However, the clevis was							
Inventory of the assembly's parts revealed that a spacer depicted in SB 727-32-0338 Option 3, was not installed in the left main landing gear side strut assembly.									
In a telephone interview, an engrassembly failures have occurred accident. He added that, as of Jur Boeing engineer discussed the symbo then forwarded a summary of Boer	ineer with the Boeing Aircraft C in the past, none have resulte ly 2000, a re-design of the clev pecifics of preliminary design w ing's proposed changes that incl	ompany said that while side-strut d in either a gear collapse or an is joint was in development. The ork with a Safety Board engineer, uded the following:							
1. Recommend that the [clevis] m 2. Add plug at the end of the c the threads that results in corr parts.	ut be installed with Mastinox BM levis that would prevent moistur rosion. 3. Modification to allow	S 327 (a corrosion preventative). e [from getting] inside and under an easier grease path for moving							
According to USAirways Shuttle main landing gear was every 500 hou	maintenance personnel, the norma rs or 500 cycles.	l interval for lubrication of the							
The flight data recorder (FDR) wa Laboratory in Washington, DC, or landing at DCA revealed only nomina	as removed from the airplane and n August 24, 1999. Data from l vertical and lateral loads on	examined at the Safety Board FDR the last takeoff from LGA and the the airplane.							

FACTUAL REPORT - AVIATION

National Transportation Safety Boa	ID: IAD99	IA059											
FACTUAL REPORT	rrence Date:	ence Date: 08/23/1999											
ÄVIATION	urrence Type: Incident												
Landing Facility/Approach Inform	nation												
Airport Name	Airport ID:	rport ID: Airport Elevation Runway Used Runway Length							nway Width				
RON REAGAN NATIONAL ARPT			DCA	16 Ft	MSL	18							
Runway Surface Type: Asphalt													
Runway Surface Condition: Dry													
Type Instrument Approach: NONE													
VFR Approach/Landing: Traffic Pattern													
Aircraft Information													
Aircraft Manufacturer Boeing				Model/Series Serial 727-200 2077							Number 74		
Airworthiness Certificate(s): Transport													
Landing Gear Type: Retractable - Tricycle													
Homebuilt Aircraft? No Nur	Certifie	d Max Gross W	/t.		175500	LBS	Number	r of Engin	es: 3				
Engine Type: Turbo Jet	Engine Manufacturer:Model/Series:P&WJT8D-7B						Rated Power: 14000 LBS						
- Aircraft Inspection Information													
Type of Last Inspection	Date of Las	Date of Last Inspection Time Since Last Inspection						Airframe -	Total Time				
AAIP	08/1999 14 Hours					ours	rs 46587 Hours						
- Emergency Locator Transmitter (ELT	- Emergency Locator Transmitter (ELT) Information												
ELT Installed? Yes ELT Operated? No					ELT Ai	ided i	n Locating Ac	cident S	Site?				
Owner/Operator Information													
Registered Aircraft Owner	Street A	Street Address P.O. BOX 710616 LAGUARDIA ARPT											
SHUTTLE INC				City State							Zip Code		
				Street Address									
Operator of Aircraft	Same as Reg'd Aircraft Owner												
Same as Reg'd Aircraft Owner	City State Zip C							Zip Code					
Operator Does Business As: US AIRWAYS Operator Designator Code:													
- Type of U.S. Certificate(s) Held:													
Air Carrier Operating Certificate(s): Flag Carrier/Domestic													
Operating Certificate:				Operator C	Certificate	e:							
Regulation Flight Conducted Under: Pa	art 121: Air Ca	rrier											
Type of Flight Operation Conducted: S	cheduled; Don	nestic;	Passenger	r Only									
FACTUAL REPORT - AVIATION Page 2													

National Transportation Safety Board NTSB ID: IAD99IA059														
FACTUAL REPORT Occurrence Date: 08/23/1999							99							
AVIATION Occurrence Type: Incident														
	"ETYBO	A'		Coouncil	oe type. In	olucint								
First Pilc	ot Information					City					Stata		to of Dirth	A
										ate of Birth	Age			
On File												53		
Sex: M	Sex: M Seat Occupied: Left Principal Profession: Civilian Pilot Certificate Number:													
Certificate(s): Airline Transport														
Airplane Rating(s): Multi-engine Land														
Rotorcraft/Glider/LTA: None														
Instrument Rating(s): Airplane														
Instructor Rating(s): None														
Type Rating/Endorsement for Accident/Incident Aircraft? Yes Current Biennial Flight Review?														
Medical Cert.: Class 1 Medical Cert. Status: Valid Medicalw/ waivers/lim. Date of Last Medica								l Exar	m: 03/1999					
- Flight Tir	me Matrix	All A/C This Make Airplane Airplane N and Model Single Engine Mult-Engine N						Actua	Instrument	nulated	Rotorcraft		Glider	Lighter Than Air
Total Time	9	16000	6000											
Pilot In Co	ommand(PIC)		114								_			
Instructor											_			
Last 90 Da	ays	114									_			
Last 30 Da	ays	62									_			
Last 24 Ho	burs	4					Tovior		arfarmad2	N		<u> </u>	Dilat2 Mar	
Seatbelt Used? Yes Shoulder Harness Used? Yes Toxicology Performed? No Second Pilot? Yes								5						
Flight Pla	an/Itinerary													
Type of Flight Plan Filed: IFR														
Departure Point							State Air		Airport Ide	Airport Identifier		Departure Time		Time Zone
NEW YORK NY LGA 1800									EDT					
Destination							State Airport Identifier				!			
Same as Accident/Incident Location DCA														
Type of Clearance: IFR														
Type of Airspace: Class B														
Weather	⁻ Information													
Source of	Briefing: Nation	al Weather	Service											
Method of	f Briefing:													
				FACTUAI	L REPORT	- AVI	ΑΤΙΟΙ	N						Page 3

Cocurrence Date: 08/23/1999 Cocurrence Type: Incident Weather Information Work Elevation Time Time Zone WOR Elevation WOR Distance From Accident Site Direction From Accident Site DCA 1851 EDT 16 Fi. MSL 0 NM 0 Deg. Mag. Sky/Lowest Cloud Condition: Scattered 20000 Fi. AGL Visibility: 10 SM Attimeter: 30.00 "Hg. Lowest Ceiling: Overcast 20000 Fi. AGL Visibility: 10 SM Attimeter: 30.00 "Hg. Yind Speed: 12 Gusts: Weather Conditions at Accident Site: Visual Conditions 0 Fi. Yisibility (RVR): 0 Fi. Visibility (RVV) 0 SM Intensity of Precipitation: Unknown Restrictions to Visibility: None Aircraft Fire: None Aircraft Explosion None Classification: U.S. Registered/U.S. Soil - Injury Summary Matrix Fatal Serios Mrer None TOTAL Firet Plot I I I I I Storent Plot I I I I Storent Plot I I	Nationa	al Transportation Safety	Board	NTSB ID	: IAD99I	A059							
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				FACTUA	L REPO	RT - AV	IATION					F	Page 4

National Transportation Safety Board	NTSB ID: IAD99IA059	
FACTUAL REPORT	Occurrence Date: 08/23/1999	
AVIATION	Occurrence Type: Incident	
Administrative Information		
Investigator-In-Charge (IIC) BRIAN C. RAYNER		
Additional Persons Participating in This Accident/Incide	ent Investigation:	
RUSSEL J JONES FAA FSDO #19 PITTSBURGH, PA		
CHARLES MARLER USAIRWAYS FLUSHING, NY 11371		