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## Tailpipe fire, Boeing 747-100, January 19, 1999

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**Micro-summary:** After landing, this Boeing 747-100's #4 thrust reverser remained deployed, resulting in a tailpipe fire.

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**Event Date:** 1999-01-19 at 0326 AST


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

**Investigative Body's Web Site:** <http://www.nts.gov/>

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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).
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		NTSB ID: ANC99IA025		Aircraft Registration Number: N481EV	
		Occurrence Date: 01/19/1999		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place FAIRBANKS		State AK	Zip Code 99709	Local Time 0326	Time Zone AST
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 747-100		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
<p>On January 19, 1999, at 0326 Alaska standard time (AST), a Boeing 747-100 airplane, N481EV, sustained minor damage when a fire occurred in the number four engine while taxiing from landing at the Fairbanks International Airport, Fairbanks, Alaska. The crew of three, and the one jumpseat passenger, were not injured. The airplane was operated by Evergreen International Airlines, Inc., of McMinnville, Oregon. The flight was operated under 14 CFR Part 121 as a supplemental air carrier international cargo flight. The flight departed Chitose, Japan, at 2159 AST, and an IFR flight plan was filed. Visual meteorological condition prevailed at the time of the incident.</p>					
<p>Interviews of the flight crew and ground personnel, conducted by the NTSB investigator-in-charge (IIC), and FAA inspectors, revealed that ground personnel observed flames coming from the number four engine after the airplane had landed, and that they notified the airport control tower via radio. Control tower personnel relayed this information to the cockpit crew. The crew then shut down the number four engine and activated the on-board fire suppression equipment. During an interview on January 20, the captain told the NTSB IIC that there were no cockpit indications of fire except for a rapidly rising exhaust gas temperature (EGT), nor any cockpit indications of the thrust reverser remaining deployed.</p>					
<p>Postincident inspection revealed soot located outside the engine cowling, and the number four thrust reverser pneumatic drive unit (PDU) was found in the thrust reverser deployed position. Internal inspection of the engine revealed no overtemperature damage, or fuel soot streaking through the turbine section. All observed evidence indicated that the fire was confined to the tailpipe area of the engine. Facsimile correspondence between Pratt and Whitney product support engineers and the operator on January 21, indicated that if the thrust reverser remained deployed during taxi, an engine surge with rising EGT condition and a tailpipe fire could result in the JT9D-7A engine.</p>					
<p>The engine fire indicating system in a JT9D-7A engine is a heat sensitive coil inside the engine cowling.</p>					
<p>The PDU, which was received in the stowed position, was disassembled under the guidance of an NTSB investigator at the AlliedSignal facility in Anniston, Alabama, on February 24, 1999. The PDU was found to have several assembly discrepancies as compared to component maintenance manual (CMM) 78-31-63, Rev 19. Some of the discrepancies were: shims were installed on the wrong side of the slinger, the oil seal was installed backwards, and shimmying spring washers to the feedback gears were installed incorrectly. The stroke of the interlock mechanism was measured to be 1.230 inches. The specified value is 1.318 to 1.326 inches. According to AlliedSignal, this stroke measurement is required to allow the gear change mechanism to fully shift (from extend, to retract). Damage was evident to the gear change mechanism outer ratchet ring, and locking pawl assembly, to include a broken pawl. All parties present on February 24 agreed that the broken pawl would result in binding in the retract direction. Other discrepancies in the buildup are noted in the teardown</p>					
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National Transportation Safety Board

## FACTUAL REPORT

AVIATION

NTSB ID: ANC99IA025

Occurrence Date: 01/19/1999


Occurrence Type: Incident


## Narrative (Continued)

report (attached) submitted by AlliedSignal. The NTSB investigator who attended the inspection on February 24 told the NTSB IIC that he concurred with all factual observations noted on that day.

The PDU was overhauled 113 hours and 26 cycles prior to failure of the retract pawl on the gear change mechanism. The broken retract pawl and gears were inspected at the NTSB metallurgical laboratory and all fracture surfaces were indicative of overstress. The geographic locations of operation for the previous 26 cycles were all warm weather locations, except for three. On January 7, and January 13, the airplane landed at Anchorage, Alaska, where the temperature was -1 degree Fahrenheit. On January 13, the airplane also landed at Khabarovsk, Russia, where the temperature was -13 degrees Fahrenheit. The ambient surface temperature at Fairbanks when the incident occurred was -27 degrees Fahrenheit.

An interview by the NTSB IIC with the chief inspector for the overhaul company revealed that other PDUs assembled by the same mechanic were recalled, and disassembled for inspection. No similar discrepancies were found with these PDUs. At the time of assembly of the failed PDU, the company had a policy of quality assurance spot checks at various steps during PDU buildup, as specified in the manufacturer's overhaul manual.

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: ANC99IA025			
		Occurrence Date: 01/19/1999			
		Occurrence Type: Incident			
<b>Landing Facility/Approach Information</b>					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
FAIRBANKS INT'L AIRPORT	FAI	434 Ft. MSL	1L	11800	150
Runway Surface Type: Asphalt					
Runway Surface Condition:					
Type Instrument Approach:					
VFR Approach/Landing: Full Stop					
<b>Aircraft Information</b>					
Aircraft Manufacturer		Model/Series		Serial Number	
Boeing		747-100		19896	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 9	Certified Max Gross Wt.	750000 LBS	Number of Engines: 4	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Fan	P&W	JT9D-7A	46150 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness	01/1999	113 Hours	26359 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated?	ELT Aided in Locating Accident Site?			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner		Street Address			
FIRST SECURITY BANK, NA		79 S. MAIN STREET			
		City	State	Zip Code	
		SALT LAKE CITY	UT	84111	
Operator of Aircraft		Street Address			
EVERGREEN INT'L AIRLINES, INC.		3850 THREE MILE LANE			
		City	State	Zip Code	
		MCMINNVILLE	OR	97128	
Operator Does Business As:			Operator Designator Code: EIAA		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic; Supplemental					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Non-scheduled; International; Cargo					
FACTUAL REPORT - AVIATION					

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: ANC991A025
	Occurrence Date: 01/19/1999
	Occurrence Type: Incident

**First Pilot Information**

Name On File	City On File	State On File	Date of Birth On File	Age 53
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s): Airline Transport; Flight Engineer

Airplane Rating(s): Multi-engine Land; Single-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?
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 01/1999
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	23000	3000				1000	1000			
Pilot In Command(PIC)	22000	3000								
Instructor										
Last 90 Days	168	168		168						
Last 30 Days	33	33		33						
Last 24 Hours	11	11		11						

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR

Departure Point CHITOSE	State JA	Airport Identifier RJCC	Departure Time 2159	Time Zone AST
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Destination Same as Accident/Incident Location	State	Airport Identifier FAI	
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Type of Clearance: IFR

Type of Airspace: Class D

**Weather Information**

Source of Briefing:  
Company

Method of Briefing:

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: ANC991A025
	Occurrence Date: 01/19/1999
	Occurrence Type: Incident

<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
	0000		0 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			400 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: None		0 Ft. AGL	Visibility: 3	SM	Altimeter: "Hg
Temperature: -33 °C	Dew Point: °C	Wind Direction:		Density Altitude: Ft.	
Wind Speed: Calm	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0	SM	Intensity of Precipitation: Unknown		
Restrictions to Visibility: Ice Fog					
Type of Precipitation: None					

<b>Accident Information</b>		
Aircraft Damage: Minor	Aircraft Fire: Ground	Aircraft Explosion: None

Classification: U.S. Registered/U.S. Soil					
- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer				1	1
Cabin Attendants					
Other Crew				1	1
Passengers					
- TOTAL ABOARD -				4	4
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	4	4

National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**

NTSB ID: ANC99IA025

Occurrence Date: 01/19/1999

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

MATTHEW L. THOMAS

Additional Persons Participating in This Accident/Incident Investigation:

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