



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	TUCSON, AZ	<b>Accident Number:</b>	LAX90FA061
<b>Date &amp; Time:</b>	12/30/1989, 1901 MST	<b>Registration:</b>	N198AW
<b>Aircraft:</b>	BOEING 737-204	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	10 Minor, 123 None
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

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## Analysis

DURING APPROACH, A FIRE ERUPTED IN THE WHEEL WELL OF THE 22-YR OLD AIRPLANE. THE FIRE BURNED THRU THE HYDRAULIC LINES RENDERING THE A, B, & STANDBY HYD SYSTEMS INOP. THE CREW LANDED THE AIRPLANE USING THE EMERGENCY MANUAL REVERSION FLIGHT CONTROL SYSTEM. HOWEVER, THE AIRPLANE WAS UNABLE TO STOP ON THE RUNWAY BECAUSE OF THE PREVIOUS FAILURES OF THE CHECK VALVES IN THE BACKUP HYD ACCUMULATOR PRESSURE SYSTEMS FOR THE #2 THRUST REVERSER AND THE INBOARD PAIR OF WHEEL BRAKES. DURING THE 2 MIN ROLLOUT, THE AIRPLANE TRAVERSED 14,000 FT, OVERRAN THE RWY END, AND COLLIDED WITH A CONCRETE STRUCTURE WHICH COLLAPSED THE NOSE GEAR. THE AIRPLANE HAD RECENTLY UNDERGONE A 'C' CHECK DURING WHICH THE OPERATOR'S MECHANICS FAILED TO OBSERVE & REPAIR AN ELECTRIC WIRE WHICH HAD BEEN CHAFING AGAINST A HYD LINE. ON THE ACCIDENT FLT THE ENERGIZED WIRE ARCED, PUNCTURED THE LINE, & IGNITED THE ESCAPING HYD FLUID. THE HYD CHECK VALVES HAD FAILED EARLIER DUE TO MECHANICAL WEAR.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: FAILURE OF THE OPERATOR'S MAINTENANCE PERSONNEL TO DETECT AN ELECTRICAL WIRE WHICH HAD CHAFED AGAINST A HYDRAULIC LINE AND WHICH EVENTUALLY ARCED CAUSING A LEAK IN THE HYDRAULIC LINE AND SUBSEQUENT FIRE AND HYDRAULIC SYSTEM FAILURE. IN ADDITION, PREVIOUS WEAR OF CHECK VALVES IN THE BACKUP HYDRAULIC SYSTEMS PREVENTED THE AIRPLANE FROM STOPPING ON THE RUNWAY. A CONTRIBUTING FACTOR WAS THE AIRPLANE MANUFACTURER'S INADEQUATE GUIDANCE FOR MAINTAINING THE HYDRAULIC COMPONENTS.

## Findings

Occurrence #1: FIRE

Phase of Operation: DESCENT - NORMAL

### Findings

1. (C) ELECTRICAL SYSTEM,ELECTRIC WIRING - CHAFED
2. (C) MAINTENANCE,INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL
3. (C) ELECTRICAL SYSTEM,ELECTRIC WIRING - ARCING
4. (C) HYDRAULIC SYSTEM,LINE - LEAK
5. HYDRAULIC SYSTEM - FIRE

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Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: APPROACH - VFR PATTERN - DOWNWIND

### Findings

6. (C) FLUID,HYDRAULIC - EXHAUSTION
7. HYDRAULIC SYSTEM - FAILURE,TOTAL

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Occurrence #3: OVERRUN

Phase of Operation: LANDING - ROLL

### Findings

8. (C) THRUST REVERSER,ACCUMULATOR - WORN
9. (C) LANDING GEAR,NORMAL BRAKE SYSTEM - WORN
10. (F) AIRCRAFT/EQUIPMENT INADEQUATE - MANUFACTURER

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Occurrence #4: ON GROUND/WATER COLLISION WITH OBJECT

Phase of Operation: LANDING - ROLL

### Findings

11. OBJECT - OTHER

## Factual Information

### Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	33, 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>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Valid Medical--w/ waivers/lim.	<b>Last Medical Exam:</b>	12/19/1989
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	10600 hours (Total, all aircraft), 3970 hours (Total, this make and model), 8290 hours (Pilot In Command, all aircraft), 217 hours (Last 90 days, all aircraft), 58 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

### Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	BOEING	<b>Registration:</b>	N198AW
<b>Model/Series:</b>	737-204 737-204	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Transport	<b>Serial Number:</b>	19710
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	122
<b>Date/Type of Last Inspection:</b>	Continuous Airworthiness	<b>Certified Max Gross Wt.:</b>	109000 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo Fan
<b>Airframe Total Time:</b>	62466 Hours	<b>Engine Manufacturer:</b>	P&W
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	JT8D-9A
<b>Registered Owner:</b>	AVIATION SALES COMPANY, INC.	<b>Rated Power:</b>	14500 lbs
<b>Operator:</b>	AMERICA WEST AIRLINES, INC.	<b>Air Carrier Operating Certificate:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	AWAX

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	TUS, 2641 ft msl	Observation Time:	1910 MST
Distance from Accident Site:	0 Nautical Miles	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear / 0 ft agl	Temperature/Dew Point:	10° C / 4° C
Lowest Ceiling:	None / 0 ft agl	Visibility	30 Miles
Wind Speed/Gusts, Direction:	9 knots, 260°	Visibility (RVR):	0 ft
Altimeter Setting:	29 inches Hg	Visibility (RVV):	0 Miles
Precipitation and Obscuration:			
Departure Point:	PHOENIX, AZ (PHX)	Type of Flight Plan Filed:	IFR
Destination:	TUCSON, AZ (TUS)	Type of Clearance:	IFR
Departure Time:	1845 MST	Type of Airspace:	Class D; Class E

## Airport Information

Airport:	TUCSON INT'L (TUS)	Runway Surface Type:	Asphalt
Airport Elevation:	2641 ft	Runway Surface Condition:	Dry
Runway Used:	29R	IFR Approach:	Visual
Runway Length/Width:	10994 ft / 150 ft	VFR Approach/Landing:	Full Stop; Traffic Pattern

## Wreckage and Impact Information

Crew Injuries:	5 None	Aircraft Damage:	Substantial
Passenger Injuries:	10 Minor, 118 None	Aircraft Fire:	Both
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	10 Minor, 123 None	Latitude, Longitude:	

## Administrative Information

Investigator In Charge (IIC):	WAYNE R POLLACK	Adopted Date:	10/07/1992
Additional Participating Persons:			
Publish Date:			
Investigation Docket:	NTSB accident and incident docket 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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