90 degree nosewheel rotation on landing, Airbus A320, February 16, 1999

Micro-summary: **This Airbus A320 landed with the nose gear rotated at a 90 degree angle.**

Event Date: **1999-02-16 at 1602 EST**

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

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

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National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: NYC99IA062	Aircraft Registration Number: N628AW
Occurrence Date: 02/16/1999	Most Critical Injury: None
Occurrence Type: Incident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
COLUMBUS	OH	43219	1602	EST	

Airport Proximity: On Airport	Distance From Landing Facility:	Direction From Airport:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Airbus Industrie	A-320-231	Airplane

Sightseeing Flight: No

Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

On February 16, 1999, at 1602 Eastern Standard Time, an Airbus A-320-231, N628AW, operated by America West Airlines as flight 2811, received minor damage when it landed at Port Columbus International Airport (CMH), Columbus, Ohio, with the nose wheels rotated 90 degrees. There were no injuries to the 2 certificated pilots, 3 flight attendants and 26 passengers. Visual meteorological conditions prevailed for the scheduled passenger flight which had departed from Newark (EWR), New Jersey, about 1404. Flight 2811 was operated on an instrument flight rules flight plan conducted under 14 CFR Part 121.

According to statements from the flight crew, flight 2811 was uneventful until the landing gear was lowered prior to landing at CMH. After the landing gear was extended to the down-and-locked position, the flight crew received indications of dual landing gear control and interface unit (LGCIU) faults.

The flight crew entered into a holding pattern and attempted to troubleshoot the faults; however, they were unable to determine the source of the problem. The flight crew then prepared for a landing at CMH, with nosewheel steering and thrust reversers inoperative due to the faults. During the final approach, at the flight crew's request, the control tower performed a visual check of the landing gear, which revealed that the nosewheels were rotated about 90 degrees.

The flight crew then initiated a missed approach and declared an emergency. The cabin crew was notified of an impending emergency landing, and the cabin and passengers were prepared for the landing. The captain initiated the approach, and described the touchdown as soft. The airplane stopped on the 10,250-foot-long runway with about 2,500 feet of runway remaining. Damage was limited to the nose landing gear tires and rims.

The captain reported that after landing, he noticed smoke was drifting up on the right side of the airplane. He said he attempted to contact the control tower and confirm if a fire was present, but was unable due to frequency congestion. He then initiated an emergency evacuation using the left and right side overwing exits.

A review of the air/ground communications, as recorded by the Columbus Air Traffic Control Tower, did not reveal a congested frequency when the emergency evacuation was initiated.

According to Airbus, nose wheel steering was hydraulically actuated through either the cockpit tiller and/or the rudder pedals.

A post-incident visual inspection of the nose landing gear assembly revealed no anomalies. The steering control module was replaced, and a subsequent functional check of the nosewheel steering was successful.

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID:	NYC99IA062
Occurrence Date:	02/16/1999
Occurrence Type:	Incident

Narrative (Continued)

The steering control module was a sealed unit, opened only during overhaul, with no specified overhaul time, and had accumulated 3,860 hours since last overhauled on March 3, 1998. It was shipped to Messier-Bugatti, the manufacturer, and examined under the supervision of the French Bureau Enquetes Accidents (BEA). The examination revealed that the external hydraulic O-ring seals on the steering control module's selector valve were extruded (distorted out of the seal's groove). A small offset was found in the steering control valve.

Airbus further reported that while the offset would have been measurable, it would not have been noticeable under normal operations. Additionally, during landing gear extension, the brake and steering control unit (BSCU) would have been energized and hydraulic pressure would have been directed toward the steering servo valve. The BSCU would have then commanded a small rotation of the nose wheel to check for proper movement. Any disagreement between the commanded position and actual position of the nose wheel would have deactivated the nose wheel steering. However, if hydraulic pressure had bypassed the steering control valve, there would have been continued pressurization to the servo valve, and because of the servo valve's inherent offset, in-flight rotation of the nose wheels.

Procedures existed for removal of hydraulic pressure from the steering control module. However, once the nosewheel strut had deflected 90 degrees, the centering cam would have been rotated to a flat area, and would have been incapable of overriding the 3,000 PSI hydraulic system, and returning the nose wheels to a centered position.

Documents from Airbus indicated there have been three similar incidents in which A320 airplanes landed with the nose wheels rotated about 90 degrees. Examination of the steering control modules on two of the airplanes revealed extrusion of the selector valve's external seals similar to that found on N628AW. Airbus had attributed the extrusion failures to the lack of a backup seal or the effects of aging on the seals. As a result of these incidents, Airbus issued Service Bulletin (SB) A320-32-1197 on October 8, 1998, to recommend replacement of the external seals on the steering control module's selector valve on A320 and A321 airplanes within 18 months of the SB's issuance.

At the time of the incident, neither the French Direction General de l'Aviation Civile (DGAC), or the Federal Aviation Administration (FAA), had adopted the service bulletin as an airworthiness directive. The operator was not required to comply with the service bulletin, and had not complied with it.

On March 24, 1999, the DGAC issued Airworthiness Directive (AD) 1999-124-129(B) to require compliance with the SB. On December 17, 1999, the FAA issued AD 99-23-09 which was based upon the French AD, with a 12 month time of compliance for modification of the nose wheel steering control valve.

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: NYC99IA062

Occurrence Date: 02/16/1999

Occurrence Type: Incident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
PORT COLUMBUS INTL ARPT	CMH	815 Ft. MSL	28L	10250	150

Runway Surface Type: Asphalt

Runway Surface Condition: Dry

Type Instrument Approach: Visual

VFR Approach/Landing: None

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Airbus Industrie	A-320-231	67

Airworthiness Certificate(s): Transport

Landing Gear Type: Retractable - Tricycle

Homebuilt Aircraft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	154	162068 LBS	2

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Fan	Int'l Aero En	V2500-A1	24800 LBS

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Continuous Airworthiness	02/1999	18 Hours	28404 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?
No		

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
WILMINGTON TRUST CO.	RODNEY SQUARE NORTH	WILMINGTON	DE	19898

Operator of Aircraft	Street Address	City	State	Zip Code
AMERICA WEST AIRLINES	4000 EAST SKY HARBOR BLVD	PHOENIX	AZ	85034

Operator Does Business As:

Operator Designator Code: AWXA

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): Flag Carrier/Domestic

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 121: Air Carrier

Type of Flight Operation Conducted: Scheduled; Domestic; Passenger/Cargo

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: NYC99IA062

Occurrence Date: 02/16/1999

Occurrence Type: Incident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File		43

Sex: M | Seat Occupied: Left | Principal Profession: Civilian Pilot | Certificate Number:

Certificate(s): Airline Transport

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?

Medical Cert.: Class 1 | Medical Cert. Status: Valid Medical--no waivers/lim. | Date of Last Medical Exam: 10/1998

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	10850									
Pilot In Command(PIC)	6000	1100								
Instructor										
Last 90 Days	141	141								
Last 30 Days	47	47								
Last 24 Hours	6	6								

Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
NEWARK	NJ	EWR	1404	EST

Destination	State	Airport Identifier
Same as Accident/Incident Location		CMH

Type of Clearance: IFR

Type of Airspace: Class C

Weather Information

Source of Briefing: Company

Method of Briefing:

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: NYC99IA062

Occurrence Date: 02/16/1999

Occurrence Type: Incident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
CMH	1550	EST	815 Ft. MSL	0 NM	0 Deg. Mag.

Sky/Lowest Cloud Condition: Scattered 5500 Ft. AGL

Condition of Light: Day

Lowest Ceiling: None 0 Ft. AGL

Visibility: 10 SM

Altimeter: 29.00 "Hg

Temperature: 15 °C

Dew Point: 6 °C

Wind Direction: 210

Density Altitude: Ft.

Wind Speed: 16

Gusts:

Weather Condtions at Accident Site: Visual Conditions

Visibility (RVR): 0 Ft.

Visibility (RVV) 0 SM

Intensity of Precipitation: Unknown

Restrictions to Visibility: None

Type of Precipitation: None

Accident Information

Aircraft Damage: Minor

Aircraft Fire: None

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					
Cabin Attendants				3	3
Other Crew					
Passengers				26	26
- TOTAL ABOARD -				31	31
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	31	31

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: NYC99IA062

Occurrence Date: 02/16/1999

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

ROBERT L. HANCOCK

Additional Persons Participating in This Accident/Incident Investigation:

RUSSELL HAYDEN
FAA FSDO
COLUMBUS, OH

JACK DRAKE
AMERICA WEST AIRLINES
PHOENIX, AZ

JEAN PAUL DE VILLENEUVE
BUREAU ENQUETES-ACCIDENTS
LE BOURGET, FR,

MARTEN BOSMAN
AIRBUS INDUSTRIES
TOLUSE, FR,