



National Transportation Safety Board Aviation Accident Final Report

Location:	Denver, CO	Accident Number:	DEN03LA076
Date & Time:	04/15/2003, 2041 MDT	Registration:	N229AM
Aircraft:	Swearingen SA226TC	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The flight was following a heavy jet on landing approach. The crew agreed to fly the approach at a slightly higher altitude than normal to avoid any possible wake turbulence. The first officer, who was flying the airplane, called for the landing gear to be lowered. When the captain placed the gear handle in the DOWN position, he noted red IN-TRANSIT lights. He recycled the landing gear, but got the same result. He consulted the emergency checklist and thought he had manually extended the landing gear because he "heard the normal 'clunk feel' and airspeed started to decay." In addition, when power was reduced to FLIGHT IDLE, the GEAR UNSAFE warning horn did not sound. The first officer agreed, noting 2,000 pounds of hydraulic pressure. The airplane landed wheels up. Propeller blade fragments penetrated the fuselage, breaching the pressure vessel. Postaccident examination revealed the nose gear had been partially extended but the main landing gear was retracted. The crew said the GEAR UNSAFE indication had been a recurring problem with the airplane. The problem had previously been attributed to a frozen squat switch in the wheel well.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the landing gear system and the flight crew's failure to ascertain that the landing gear was down and locked. A contributing factor was the inadequate maintenance inspections performed by maintenance personnel.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: APPROACH

Findings

1. (C) LANDING GEAR,NORMAL RETRACTION/EXTENSION ASSEMBLY
 2. GEAR EXTENSION - PERFORMED - PILOT IN COMMAND
 3. (F) MAINTENANCE,INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL
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Occurrence #2: WHEELS UP LANDING

Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

4. (C) GEAR DOWN AND LOCKED - NOT VERIFIED - FLIGHTCREW

Factual Information

On April 15, 2003, at 2041 mountain daylight time, a Swearingen SA226TC, N229AM, operated by Superior Aviation, Inc., of Kingsford, Michigan, as flight HKA 1813, was substantially damaged during a wheels-up landing on runway 35L at Denver International Airport, Denver, Colorado. The airline transport certificated captain and commercial certificated first officer were not injured. Visual meteorological conditions prevailed, and an IFR flight plan had been filed for the nonscheduled domestic cargo flight being conducted under Title 14 CFR Part 135. The flight originated at Gunnison, Colorado, approximately 2000.

The following is based on the accident report and a written statement submitted by the captain. The flight had been radar vectored behind and was following a heavy jet for an approach to runway 35L. As a result, it was mutually agreed that the approach would be conducted at a slightly higher altitude than normal to avoid any possible wake turbulence. The first officer, who was flying the airplane, called for the landing gear to be lowered. When the captain placed the gear handle in the DOWN position, he noted red IN-TRANSIT lights and remarked to his first officer, "It's happening again. The nose is not coming down." He recycled the landing gear, but got the same result. He consulted the emergency checklist and extended the landing gear manually. He felt confident that the landing gear was down and locked because he "heard the normal 'clunk feel' and airspeed started to decay." In addition, when power was reduced to FLIGHT IDLE, the GEAR UNSAFE warning horn did not sound. He wrote, "In the past, when there was no green indication in this aircraft with the use of the emergency extension system, the gear remained down and locked." He felt the wheels contact the runway, but the airplane continued to sink and then he heard the propellers striking the pavement.

The first officer's statement corroborated that of the captain's. He added, "Sometimes, the squat switch in the wheel well for the position lights freeze and are showing red when they should be green or out." Following the emergency checklist, the landing gear was manually extended and he noted 2,000 pounds of hydraulic pressure. This made him feel confident that the landing gear was down and locked.

According to an FAA aviation safety inspector who examined the airplane, the nose landing gear was partially extended, but the main landing gear was not. Propeller blade fragments penetrated the fuselage and breached the pressure vessel.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	39, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	03/26/2003
Occupational Pilot:		Last Flight Review or Equivalent:	11/21/2002
Flight Time:	4565 hours (Total, all aircraft), 2179 hours (Total, this make and model), 4244 hours (Pilot In Command, all aircraft), 124 hours (Last 90 days, all aircraft), 70 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Commercial	Age:	39, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	09/12/2002
Occupational Pilot:		Last Flight Review or Equivalent:	01/03/2003
Flight Time:	2517 hours (Total, all aircraft), 1400 hours (Total, this make and model), 1094 hours (Pilot In Command, all aircraft), 139 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Swearingen	Registration:	N229AM
Model/Series:	SA226TC	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	TC-305
Landing Gear Type:	Retractable - Tricycle	Seats:	3
Date/Type of Last Inspection:	04/03/2003, AAIP	Certified Max Gross Wt.:	12500 lbs
Time Since Last Inspection:	26 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	31643 Hours at time of accident	Engine Manufacturer:	Garrett
ELT:	Installed, not activated	Engine Model/Series:	TPE 331-34
Registered Owner:	Superior Aviation, Inc.	Rated Power:	840 hp
Operator:	Superior Aviation, Inc.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	EATA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	DEN, 5431 ft msl	Distance from Accident Site:	
Observation Time:	2042 MDT	Direction from Accident Site:	
Lowest Cloud Condition:	Thin Broken	Visibility	10 Miles
Lowest Ceiling:	Broken / 3000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	26 knots / 31 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	240°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.55 inches Hg	Temperature/Dew Point:	7°C / -4°C
Precipitation and Obscuration:			
Departure Point:	Gunnison, CO (GUC)	Type of Flight Plan Filed:	IFR
Destination:	Denver, CO (DEN)	Type of Clearance:	IFR
Departure Time:	2000 MDT	Type of Airspace:	Class B

Airport Information

Airport:	Denver International (DEN)	Runway Surface Type:	Concrete
Airport Elevation:	5431 ft	Runway Surface Condition:	Wet
Runway Used:	35L	IFR Approach:	ILS
Runway Length/Width:	12000 ft / 150 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	39.858333, -104.666944

Administrative Information

Investigator In Charge (IIC):	Arnold W Scott	Report Date:	11/25/2003
Additional Participating Persons:	Michele J Wallentine; FAA Flight Standards District Office; Denver, CO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets 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 pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).