



Aviation Investigation Final Report

Location:	EDEN PRAIRIE, Minnesota	Accident Number:	CHI99LA265
Date & Time:	July 31, 1999, 11:00 Local	Registration:	N310DE
Aircraft:	Cessna 310N	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported the flight was uneventful the left main landing gear 'broke' on touchdown. The airplane veered left where it contacted a taxiway information sign and the nose gear collapsed prior to the airplane coming to rest. The left main landing gear strut collapsed rearward damaging the left wing aft spar. Inspection of the left main gear revealed the upper and lower portions of the scissors link detached from each other allowing the lower portion of the strut to rotate within the upper portion of the strut. The bolt, washers, bushings, nut, and cotter pin remained attached to the upper link. There were three washers present near the head of the bolt. All three were painted white and had an outside diameter of 3/4 inch. There were four washer present at the castellated nut end of the bolt. None of these washers were painted and all of them had an outside diameter of 9/16 inch. This is the same outside diameter as the bushing and same inside diameter as the hole on the scissors link.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: maintenance personnel installed washers which were not large enough in diameter to prevent the retraction/extension scissors links from separating from each other.

Findings

Occurrence #1: MAIN GEAR COLLAPSED
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

1. (C) MISCELLANEOUS, BOLT/NUT/FASTENER/CLAMP/SPRING - IMPROPER
 2. (C) MAINTENANCE, INSTALLATION - IMPROPER - OTHER MAINTENANCE PERSONNEL
 3. (C) LANDING GEAR, NORMAL RETRACTION/EXTENSION ASSEMBLY - DISCONNECTED
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Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER

Phase of Operation: LANDING - ROLL

Findings

4. DIRECTIONAL CONTROL - NOT POSSIBLE - PILOT IN COMMAND
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Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT

Phase of Operation: LANDING - ROLL

Findings

5. OBJECT - AIRPORT SIGN/MARKER

Factual Information

On July 31, 1999, at 1100 central daylight time (cdt), a Cessna 310N, N310DE, experienced a left main gear collapse while landing on runway 27 at the Flying Cloud Airport, Eden Prairie, Minnesota. The pilot and passenger were not injured. The airplane was substantially damaged. The 14 CFR Part 91 personal flight was operating in visual meteorological conditions without a flight plan. The local flight originated from the Flying Cloud Airport, at 1000 cdt.

The pilot reported that the flight was uneventful until the landing. He reported the airplane was lined up on the centerline of the runway in a 400 foot per minute descent during the approach. The pilot reported that the left main landing gear "broke" on touchdown. He stated the airplane "slowly drifted to the left" until the airplane came to a stop. The airplane contacted a taxiway information sign and the nose gear collapsed prior to the airplane coming to rest.

Post accident inspection revealed the left main landing gear strut collapsed rearward damaging the left wing aft spar. Inspection of the left main gear revealed the upper and lower portions of the scissors link had become detached from each other allowing the lower portion of the strut to rotate within the upper portion of the strut. The bolt, washers, bushings, nut, and cotter pin remained attached to the upper link.

There were three washers present near the head of the bolt. All three were painted white and had an outside diameter of 3/4 inch. There were four washer present at the castellated nut end of the bolt. None of these washers were painted and all of them had an outside diameter of 9/16 inch. This is the same outside diameter as the bushing and same inside diameter as the hole on the scissors link.

Pilot Information

Certificate:	Private	Age:	38, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	March 26, 1998
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	475 hours (Total, all aircraft), 170 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N310DE
Model/Series:	310N 310N	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	310N-0182
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	July 1, 1998 Annual	Certified Max Gross Wt.:	5200 lbs
Time Since Last Inspection:	130 Hrs	Engines:	2 Reciprocating
Airframe Total Time:	5500 Hrs	Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	IO-470-VO
Registered Owner:	WINDSOR AVIATION	Rated Power:	260 Horsepower
Operator:	BAHRAM AKRADI	Operating Certificate(s) Held:	None
Operator Does Business As:		Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	FCM ,906 ft msl	Distance from Accident Site:	
Observation Time:	11:00 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 25000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	320°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	26°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(FCM)	Type of Flight Plan Filed:	None
Destination:	(FCM)	Type of Clearance:	VFR
Departure Time:	10:00 Local	Type of Airspace:	Class B

Airport Information

Airport:	FLYING CLOUD FCM	Runway Surface Type:	Asphalt
Airport Elevation:	906 ft msl	Runway Surface Condition:	Dry
Runway Used:	27	IFR Approach:	
Runway Length/Width:	3900 ft / 75 ft	VFR Approach/Landing:	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	44.860996,-93.430427(est)

Administrative Information

Investigator In Charge (IIC):	Sullivan, Pamela
Additional Participating Persons:	JANICE ORR; MINNEAPOLIS , MN
Original Publish Date:	June 22, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=46905

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).