Aviation Investigation Final Report

Location:	CAHOKIA, Illinois	**Accident Number:**	CHI98LA282
Date & Time:	June 27, 1998, 10:06 Local	**Registration:**	N4249C
Aircraft:	Cessna 310R	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The airplane impacted the runway following the collapse of the left main landing gear and subsequent loss of control, during landing rollout. A metallurgical analysis of the spring down lock adjustment screw was performed. The chemical composition of the adjustment screw conformed to the requirements of MIL-S-6758. The hardness of the adjusting screw was found to be 29-30 HRC and in compliance with MIL-S-6758 for 4130 steel. The adjusting screw fracture exhibited characteristics of overload with no indications of fatigue or corrosion crack. The pilot's operating handbook specifies the maximum demonstrated crosswind velocity to be 19 knots at a landing weight of 5400 lbs. at sea level conditions on a standard day. The 1006 CDT ASOS observation indicates wind velocity to be 210 at 8 knots with no gusts. The empty weight of the aircraft was 3816 lbs. Fuel quantity was reported to be 200 gallons. A review of maintenance records showed that the landing gear had been inspected during a phase two progressive inspection in accordance with the Cessna Aircraft's 310 Service Manual Inspection Checklist. There were no entries in the remarks section of the checklist pertaining to the landing gear. The inspection was completed on April 25, 1998. The time since last inspection was 47 hours.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The collapse of the left main landing gear during landing roll for undetermined reasons.

Findings

Occurrence #1: MAIN GEAR COLLAPSED
Phase of Operation: LANDING - ROLL

Findings
1. (C) LANDING GEAR,MAIN GEAR - COLLAPSED
2. (C) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: LANDING - ROLL

Findings
3. (C) LANDING GEAR,MAIN GEAR - COLLAPSED

Factual Information

On June 27, 1998, at 1006 central daylight time(cdt), a Cessna 310R, N4249C, piloted by a commercial pilot, received substantial damage on impact with terrain, following the collapse of the left main landing gear and subsequent loss of control, during landing rollout on runway 12R (6,997' X 100', asphalt) at St. Louis Downtown-Parks Airport, near Cahokia, Illinois. Visual meteorological conditions prevailed at the time of the accident. The 14 CFR Part 91 instructional flight was not operating on a flight plan. The pilot and student reported no injuries. The local flight originated at Cahokia Airport at 0830.

The instructor and student reported that they departed to the south to practice in-flight maneuvers outlined in their lesson plan. While performing these maneuvers, the landing gear was extended four or five times; the gear down and locked indicator lights illuminated green upon each extension. They returned to the Downtown-Parks Airport via radar vectors to conduct two ILS 30R approaches. During the first approach, the landing gear was extended and later retracted following a missed approach. During the second approach, the landing gear was extended at glide slope interception, retracted at simulated engine failure and then extended to perform a touch and go on 12R. The landing gear position lights were illuminated green prior to the touch and go, which was reported to have been smooth. They then entered right traffic for runway 12R and executed a short field landing with a touch and go. They reentered the downwind portion of the traffic pattern to conduct a full stop short field landing on 12R. On the downwind leg, the student selected 15 degrees of flap. At the midfield downwind position, the student lowered the landing gear and asked the instructor to verify three green lights and that the gear was down. The instructor responded by saying that the gear was down. The airspeed on the base leg was 110 KIAS. Upon turning final, the VASI was white over white. The student then pitched down and pulled the throttles out to get onto the glide path with an airspeed of 95 KIAS. The student completed a final gumps check and asked the instructor to verify the final gumps check to be complete. The instructor looked at the fuel, landing gear position lights, mixture and props and responded to the student that the final gumps check is complete. At approximately 1700' from the approach end of the runway, the instructor noted that they were a little high and instructed the student to pitch down a little and adjust power. Over the runway threshold, the instructor observed the three landing gear position indicators to be illuminated green. The instructor reported that the student had made a normal short field landing that was smooth. The main landing gear wheels touched down first and then the nose wheel. During rollout, the right wing felt as if it were coming off the ground. The instructor reached up and turned the control yoke to the right as she felt that the student did not have enough wind correction. At this time the student was also moving the control wheel to the right. The aircraft was at approximately 60 KIAS to 70 KIAS. They then heard a metal scraping sound coming from the left side of the aircraft. The aileron input was not effecting the condition. The left wing kept falling and the aircraft began to veer towards the left and off the runway.

The left main landing gear tire exhibited scuffing towards the inboard direction. The left main landing gear strut to side brace connecting bolt was rolled on a flat plate and found to be true. The lock assembly to side brace connecting bolt was bent in the downward direction. The adjusting screw on the lower side brace lock assembly was fractured. The forward and aft torque tube attach points were deformed. The two port side flap motor/gear box spar web attach points exhibited pulling in the aft direction. A horizontal crack was observed at the upper starboard attach point. The landing gear motor circuit breaker was not actuated. The landing gear motor circuit breaker was not actuated.

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Pilot Information

Certificate:	Commercial	**Age:**	27,Female
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	January 20, 1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1534 hours (Total, all aircraft), 120 hours (Total, this make and model), 1368 hours (Pilot In Command, all aircraft), 106 hours (Last 90 days, all aircraft), 35 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N4249C
Model/Series:	310R 310R	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1380
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	April 24, 1998 Continuous airworthiness	**Certified Max Gross Wt.:**	5535 lbs
Time Since Last Inspection:	47 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	6567 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-MB
Registered Owner:	PARKS COLLEGE OF ST, LOUIS	**Rated Power:**	285 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	NI1S

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CPS ,413 ft msl	**Distance from Accident Site:**	
Observation Time:	10:06 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	30°C / 27°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	08:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	ST. LOUIS DOWNTOWN-PARKS CPS	**Runway Surface Type:**	Asphalt
Airport Elevation:	413 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	12R	**IFR Approach:**	None
Runway Length/Width:	6997 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	38.570392,-90.169448(est)

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	JOEL PETTUS; ST. LOUIS , MO
Original Publish Date:	February 16, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=43109