



National Transportation Safety Board Aviation Accident Final Report

Location:	TULSA, OK	Accident Number:	FTW97LA041
Date & Time:	11/01/1996, 1100 CST	Registration:	N9520B
Aircraft:	Cessna 172RG	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 None

Flight Conducted Under: Part 91: General Aviation - Instructional

Analysis

A witness stated that the airplane 'flared smoothly and touched down with what appeared to be no side load.' As the aircraft settled onto the runway surface, the right main gear collapsed, and the aircraft subsequently skidded off the right side of the runway. During examination of the right main landing gear, it was discovered that the gear pivot assembly was fractured adjacent to the spline. It has not been determined as to whether the fracture occurred during gear retraction, extension, or upon contact with the runway. According to maintenance records, Cessna Service Bulletin, SE390.1, April 20, 1990, was applicable to this aircraft and was complied with. The Service Bulletin's purpose was to inspect main landing gear pivot assemblies for cracks in the spline area. The pivot assembly that failed, P/N 2441100-9, had a total time of 1,611.8 hours. Visual inspection of the fractured surface showed evidence of overload, however a small area on the outer portion of the surface had several small cracks bordering the edge.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the main landing gear pivot gear assembly.

Findings

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

Findings

1. LANDING GEAR, GEAR INDICATING SYSTEM - INOPERATIVE
2. (C) LANDING GEAR, NORMAL RETRACTION/EXTENSION ASSEMBLY - FRACTURED

Factual Information

On November 1, 1996, approximately 1100 central standard time, a Cessna 172RG, N9520B, was substantially damaged following a collapse of the right main landing gear during landing roll out, at Riverside Airport, Tulsa, Oklahoma. The private pilot was not injured. No flight plan was filed, and visual meteorological conditions prevailed for the Title 14 CFR Part 141 solo instructional flight.

In an interview with the investigator-in-charge the pilot reported that he was practicing stall maneuvers in a designated practice area adjacent to the airport. Upon completion of the maneuvers, he returned to the airport and set up for landing on runway 1L. After executing the pre-landing checklist, he noticed that the green landing gear down light was not illuminated. After an unsuccessful attempt to change light bulbs, he tried to pump the manual gear extension handle, but "it would not move." He was able to visually check the left main gear but could not see the right gear. After contemplating a go around, the pilot decided to land.

One witness, who was observing the airplane as it was on final, reported that he thought that the nose gear and left main was down and locked, but the right main did not appear to be in the locked position. Another witness, who was observing, reported that he thought that all three landing gears were down and locked. He further reported that the airplane "flared smoothly and touched down with what appeared to be no side load." As the aircraft settled onto the runway surface, the right main gear collapsed. Subsequently, the aircraft skidded off the right side of the runway. The right wing was structurally damaged.

Inspection of the aircraft after the accident revealed that the landing gear down light bulb was burned out and was not related to the gear collapse. During examination of the right main landing gear, it was discovered that the gear pivot assembly was fractured adjacent to the spline (illustration is attached to this report). It has not been determined as to whether the fracture occurred during gear retraction, extension, or upon contact with the runway.

According to maintenance records, Cessna Service Bulletin, SE390.1, April 20, 1990, was applicable to this aircraft and was complied with. The Service Bulletin's purpose was to inspect main landing gear pivot assemblies for cracks in the spline area. The pivot assembly that failed, P/N 2441100-9, had a total time of 1,611.8 hours. Visual inspection of the fractured surface showed evidence of overload, however a small area on the outer portion of the surface had several small cracks bordering the edge. The part was sent to the NTSB metallurgy laboratory in Washington, D.C, for further analysis

The metallurgist who examined the pivot assembly reported that a large portion of the fracture face showed torsional mechanical damage. A roughly circular area of undamaged features surrounded the drilled hole near the center of the shaft. The undamaged area had features typical of an overstress separation. The damaged area had features typical of rotational smearing and mechanical deformation. Mechanically damaged ratchet mark features covered an arc of approximately 100 degrees around the outside edge of the shaft. Small longitudinally oriented cracks emanated from most of the ratchets. Hardness and electrical conductivity measurements were consistent with the engineering drawing specified material (7171-T74 aluminum alloy) for the part.

Pilot Information

Certificate:	Private	Age:	27, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	09/26/1996
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	101 hours (Total, all aircraft), 9 hours (Total, this make and model), 25 hours (Pilot In Command, all aircraft), 23 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N9520B
Model/Series:	172RG 172RG	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	172RG0851
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	09/25/1996, 100 Hour	Certified Max Gross Wt.:	2658 lbs
Time Since Last Inspection:	89 Hours	Engines:	1 Reciprocating
Airframe Total Time:	5673 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-360-F1A6
Registered Owner:	CHRISTIANSEN AVIATION INC.	Rated Power:	180 hp
Operator:	SPARTAN SCHOOL OF AERONAUTICS	Operating Certificate(s) Held:	None
Operator Does Business As:		Operator Designator Code:	DF2S

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	, 0 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0000	Direction from Accident Site:	0°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	Overcast / 4700 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	8 knots / 16 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	10°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	5°C / -1°C
Precipitation and Obscuration:			
Departure Point:	(RVS)	Type of Flight Plan Filed:	Company VFR
Destination:		Type of Clearance:	None
Departure Time:	0930 CST	Type of Airspace:	Class E

Airport Information

Airport:	RIVERSIDE JONES (RVS)	Runway Surface Type:	Asphalt
Airport Elevation:	638 ft	Runway Surface Condition:	Dry
Runway Used:	7	IFR Approach:	None
Runway Length/Width:	5101 ft / 100 ft	VFR Approach/Landing:	Full Stop

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	ALEXANDER LEMISHKO	Report Date:	08/25/1997
Additional Participating Persons:	JERRY YATES; OKLAHOMA CITY, OK		
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 pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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