



National Transportation Safety Board Aviation Incident Final Report

Location:	Mount Pleasant, TX	Incident Number:	CEN10IA453
Date & Time:	08/01/2010, 1200 CDT	Registration:	N4184X
Aircraft:	PIPER PA-32R-301T	Aircraft Damage:	None
Defining Event:	Sys/Comp malf/fail (non-power)	Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The pilot reported that he was in level flight with the autopilot engaged when the airplane began an uncommanded roll. The pilot disengaged the autopilot and found that the airplane's ailerons were inoperative. The pilot made a successful landing using the rudder for directional and roll control. A postaccident examination of the airplane revealed that the right aileron primary control cable was severed where it contacted an idler pulley. That pulley would not rotate due to an out-of-tolerance idler pulley outer bearing that restricted the rotation of the pulley. It is likely that the control cable sliding against the seized pulley caused the cable to wear through. The airplane manufacturer issued a maintenance alert following this incident that highlighted the importance of proper and recurring inspections of the flight control cables and pulleys.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The failure of an aileron control cable due to a seized idler pulley bearing.

Findings

Aircraft	Aileron control system - Failure (Cause)
	Aileron control system - Fatigue/wear/corrosion (Cause)

Factual Information

On August 1, 2010, about 1200 central daylight time, a Piper PA-32R-301T airplane, N4184X, experienced a total loss of aileron control prior to landing at the Mount Pleasant Municipal Airport (OSA), Mount Pleasant, Texas. The airplane was not damaged and the commercial pilot was not injured. The positioning flight originated at Gilmer Municipal Airport (JXI), Gilmer, Texas, with OSA as the intended destination. The flight was being conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed at the time of the incident.

The pilot reported he was level at 2,000 feet mean sea level, about 10 miles from OSA, when the airplane started an un-commanded left roll. He disengaged the autopilot and discovered the ailerons were not responding. The pilot landed successfully at OSA using the rudder to control the airplane.

The airplane aileron control system included two control cables routed to each wing; the primary cable and the balance cable. A postaccident examination by the operator revealed the right wing (RW) primary cable was completely severed 13 inches from the threaded end of the cable, roughly located adjacent to an idler pulley. The pulley could not be rotated when manipulated. Additional wear spots, indicated by polishing and/or fraying were annotated at additional locations on the RW primary cable, the RW balance cable, and left wing (LW) primary and balance cables. The RW primary cable had a dark grease like material covering the failure area. A similar substance was found on the idler pulley. An additional idler pulley for the RW balance cable was found that initially did not rotate when manipulated. The person manipulating the idler pulley twisted it firmly and heard a “click.” The pulley turned freely following the click.

Inspectors from the Federal Aviation Administration examined the airplane and components on August 5, 2010. They stated the idler pulley at the location of the cable failure appeared to have a manufacturing flaw, in that it was not machined completely through, which created a “lip” that did not allow the bushing to go completely through the idler pulley.

The suspect RW primary cable idler pulley and portions of the broken RW primary cable were sent to the manufacturer for examination. The inside diameter of the idler pulley outer bearing was found to measure .0065 inches less than the service limit for the component. The submitted portion of the primary cable was found to be manufactured from galvanized steel.

Piper Aircraft, Inc. issued Service Letter No. 1135 as a maintenance alert on October 19, 2010. The alert emphasized the critical nature of control cable and pulley inspections, and highlighted the recurring inspection requirements. It included instructions for inspections of control cables and pulleys.

History of Flight

Enroute	Sys/Comp malf/fail (non-power) (Defining event) Inflight upset
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Pilot Information

Certificate:	Commercial; Private	Age:	23, 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:	No
Instructor Rating(s):	Airplane Single-engine; Instrument Airplane	Toxicology Performed:	
Medical Certification:	Class 2 None	Last Medical Exam:	09/29/2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	11/12/2009
Flight Time:	644 hours (Total, all aircraft), 36 hours (Total, this make and model), 539 hours (Pilot In Command, all aircraft), 99 hours (Last 90 days, all aircraft), 32 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	PIPER	Registration:	N4184X
Model/Series:	PA-32R-301T	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	3257200
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	09/25/2009, Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	2795 Hours	Engine Manufacturer:	LYCOMING
ELT:	Installed, not activated	Engine Model/Series:	TIO-540 SER
Registered Owner:	SOUTH CENTRAL LOGISTICS LLC	Rated Power:	310 hp
Operator:	SOUTH CENTRAL LOGISTICS LLC	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	OSA	Observation Time:	1600 UTC
Distance from Accident Site:	10 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:		Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:		Temperature/Dew Point:	38° C / 18° C
Lowest Ceiling:		Visibility	10 Miles
Wind Speed/Gusts, Direction:	Light and Variable, Variable	Visibility (RVR):	
Altimeter Setting:	29.87 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:			
Departure Point:	Gilmer, TX (JXI)	Type of Flight Plan Filed:	VFR
Destination:	Mount Pleasant, TX (OSA)	Type of Clearance:	None
Departure Time:	1130 CDT	Type of Airspace:	

Airport Information

Airport:	Mt Pleasant Regional Airport (OSA)	Runway Surface Type:	
Airport Elevation:	364 ft	Runway Surface Condition:	
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	None
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	
Total Injuries:	1 None		

Administrative Information

Investigator In Charge (IIC):	Daniel Baker	Adopted Date:	06/28/2012
Additional Participating Persons:	Tony Baumgard; FAA; Dallas, TX		
Publish Date:	06/28/2012		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=76815		

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