



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Meriden, Connecticut	Accident Number:	ERA11LA264
Date & Time:	April 22, 2011, 16:25 Local	Registration:	N2838D
Aircraft:	Piper PA-28-161	Aircraft Damage:	Substantial
Defining Event:	Landing gear collapse	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The student pilot entered the left downwind leg of the traffic pattern at the airport. While on the final leg of the traffic pattern, the airplane encountered vertical wind shear and landed hard on the runway. After the impact, the right main landing gear of the airplane collapsed, and the pilot taxied off the right side of the runway, coming to rest perpendicular to the runway. The most recent annual inspection was performed 3 months before the accident, and at that time the airplane had accumulated 13,962.8 hours of total time in service. The airplane was involved in another accident 2 months earlier that involved a hard landing. Thirteen days before the accident, the most recent maintenance was completed on the airplane that involved an inspection of the main landing gear. The airplane was found to be in airworthy condition, was signed off on that date, and at that time had 14,055.3 hours of total time in service. Examination of the inboard torque link lug of the right main landing gear revealed that it failed as a result of progressive fatigue cracking. The lugs are the subject of a Piper service bulletin recommending repetitive 100-hour recurrent inspections for cracking in the lugs. Although the complete loading history of the gear is unknown, it is likely that detectable indications of metal fatigue would have been present for more than 100 flight hours. There was no documentation in the airplane's maintenance records that indicated that the factory service bulletin had been performed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Maintenance personnel's inadequate inspection of the main landing gear, which resulted in a failure of the right main landing gear's inboard torque link lug due to a fatigue fracture. Contributing to the accident was owner's lack of compliance with a factory service bulletin addressing landing gear inspections.

Findings

Aircraft	Main gear strut/axle/truck - Not inspected
Personnel issues	Lack of action - Owner/builder
Personnel issues	Scheduled/routine inspection - Maintenance personnel

Factual Information

History of Flight

Landing-flare/touchdown	Abnormal runway contact
Landing-flare/touchdown	Landing gear collapse (Defining event)
Landing-landing roll	Runway excursion

On April 22, 2011, about 1625 eastern daylight time (EDT), a Piper PA-28-161, N2838D, had the right main landing gear collapse during landing at Meriden Markham Municipal Airport (MMK), Meriden, Connecticut. The student pilot was uninjured. The airplane sustained substantial damage to the right wing. Visual meteorological conditions prevailed, and no flight plan was filed for the solo personal flight, which was conducted under the provisions of 14 Code of Federal Regulations Part 91. The flight originated from Waterbury-Oxford Airport, Oxford, Connecticut, around 1430.

According to the student pilot, he arrived at the airport around 1325, completed the preflight inspection, and found no anomalies with the airplane. He started the engine and completed an engine run-up, then departed the airport without incident. He landed at Danielson Airport (LDZ), Danielson, Connecticut, then taxied back to the runway and departed LDZ for MMK around 1610. At that time, the pilot reported everything was "normal."

The student pilot entered the left downwind leg of the traffic pattern at MMK for runway 18. When he turned onto the final leg, he input full flaps and lowered the airspeed to 73 knots. The airplane encountered "vertical wind shear" and landed "hard" on the runway. After the impact, the right main landing gear of the airplane collapsed and the pilot taxied off the right side of the runway, coming to rest perpendicular to the runway.

The airplane was examined at the accident scene by a Federal Aviation Administration (FAA) inspector. According to the inspector, the right wing was wrinkled at the wing root aft of the main spar and dented on the forward outboard section of the wing. Examination of the landing gear revealed that the right main landing gear cylinder torque link attachment point was fractured from the right main landing gear assembly. A visual examination of the fracture surface indicated that it was partially discolored.

According to the pilot, he held a student pilot certificate issued in May of 2009. His most recent second class medical certificate was issued on May 20, 2009. He reported 139 total hours of flight time, of which, 67 hours were in the same make and model as the accident airplane.

According to FAA records, the airplane was manufactured in 1979, and was registered to an individual in 2008. It was a single-engine, fixed tricycle gear, monoplane that was equipped

with a Lycoming O-320 series, 180-horsepower engine. The most recent annual inspection was performed on January 13, 2011. At that time, the airplane had 13,962.8 hours of total time in service.

The airframe maintenance records indicate that on May 4, 2010, a mechanic "rebuilt the left and right main struts." At that time, the airplane accumulated 13,457.7 total hours in service.

According to National Transportation Safety Board records, the accident airplane was involved in an accident (ERA11CA187) on March 12, 2011. The accident occurred on an instructional flight and involved a hard landing.

According to the airframe maintenance records, the most recent maintenance performed on the airplane occurred on April 9, 2011, which was after the first airplane accident. The engine was removed from the airplane, inspected, and reinstalled. In addition, both the left and right main landing gear struts were inspected for condition and serviced with nitrogen. The airplane was signed off, and at that time, it had 14,055.3 total hours of time in service.

An examination of the right main landing gear strut cylinder by the Safety Board Materials Laboratory revealed that the outboard lug fracture was consistent with an overstress separation and there were no indications of a preexisting crack. In contrast, the inboard lug fracture was darkly discolored across the majority of the fracture with a prominent arrest line consistent with a preexisting crack. Fracture markings indicated that the fatigue initiated on the machined outboard surface of the lug at several locations in a small region near the lower edge of the fracture.

Cast main landing gear struts on certain Piper PA-28's are the subject of Piper Service Bulletin 1131, dated August 18, 2003. Although it was not mandatory, the service bulletin applied to the accident airplane. The service bulletin recommended a repetitive 100 hour inspection for cracks in the torque link lugs on all cast landing gear strut cylinders. The service bulletin also indicates that a forged strut cylinder was available and if installed, the airplane would be exempt from the periodic inspections. A metallographic cross section through a portion of the fractured cylinder performed by the Safety Board Materials Laboratory confirmed that the accident strut cylinder was cast aluminum.

The airframe maintenance records did not include a list of applicable service bulletins. In addition, a review of the maintenance records did not indicate that Piper Service Bulletin 1131, dated August 18, 2003, was performed.

Student pilot Information

Certificate:	Student	Age:	31, Male
Airplane Rating(s):	None	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 With waivers/limitations	Last FAA Medical Exam:	May 20, 2009
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	139 hours (Total, all aircraft), 67 hours (Total, this make and model), 33 hours (Pilot In Command, all aircraft), 14 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N2838D
Model/Series:	PA-28-161	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	28-7916463
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	January 13, 2011 Annual	Certified Max Gross Wt.:	2200 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	13962 Hrs as of last inspection	Engine Manufacturer:	LYCOMING
ELT:	Installed, not activated	Engine Model/Series:	O-320 SERIES
Registered Owner:	PERSAUD MUNIDAT	Rated Power:	180 Horsepower
Operator:	PERSAUD MUNIDAT	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	MMK	Distance from Accident Site:	0 Nautical Miles
Observation Time:	15:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	11000 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 11000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	10 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	170°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.42 inches Hg	Temperature/Dew Point:	11°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Danielson, CT (LZD)	Type of Flight Plan Filed:	VFR
Destination:	Merident, CT (MMK)	Type of Clearance:	None
Departure Time:	16:10 Local	Type of Airspace:	

Airport Information

Airport:	Meriden Markham Municipal Airp MMK	Runway Surface Type:	Asphalt
Airport Elevation:	103 ft msl	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	3100 ft / 75 ft	VFR Approach/Landing:	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	41.508609,-72.829444(est)

Administrative Information

Investigator In Charge (IIC):	Obregon, Jose
Additional Participating Persons:	Joseph R White; FAA/FSDO; Windsor Locks, CT
Original Publish Date:	August 29, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=78952

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