Aviation Investigation Final Report

Location:	West Chicago, Illinois	**Accident Number:**	CEN14LA196
Date & Time:	April 11, 2014, 16:07 Local	**Registration:**	N1972M
Aircraft:	Piper PA 46-350P	**Aircraft Damage:**	Substantial
Defining Event:	Aircraft structural failure	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The commercial pilot was conducting a business flight and was preparing to land the airplane. He reported that, during the landing approach, he lowered the landing gear, which resulted in a gear down-and-locked indication. He subsequently made a smooth landing, but as soon as the nose gear touched down, the airplane "yanked severely to the left." He attempted to maintain directional control, but the airplane exited the left side of the runway into grass, the right wing contacted an airport sign, and the landing gear collapsed.

A postaccident examination revealed that the nose gear actuator attachment to the engine mount was fractured in two places. A metallurgical examination revealed that the fracture surfaces and deformation patterns were indicative of overstress separations at both locations. No preexisting cracking was noted. The investigation could not determine whether the overstress damage occurred during the accident landing or previous landings.

The airplane manufacturer had previously issued a service bulletin (SB), which recommended that an initial inspection of the engine mount for cracks in the area of the nose gear actuator attachment be accomplished at 740 hours time in service (TIS). However, the airplane only had 550 hours TIS at the time of the accident; therefore, it had not undergone the initial inspection recommended by the SB. Following the accident, the manufacturer reduced the initial inspection time to 200 hours TIS and redesigned the engine mount.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The failure of the nose gear actuator attachment to the engine mount due to overstress, which resulted in the loss of directional control during landing.

Findings

Aircraft	Nose/tail landing gear - Malfunction
Aircraft	Mounts - Failure
Aircraft	Directional control - Attain/maintain not possible
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Landing-landing roll	Aircraft structural failure (Defining event)
Landing-landing roll	Loss of control on ground
Landing-landing roll	Collision with terr/obj (non-CFIT)
Landing-landing roll	Landing gear collapse

On April 11, 2014, about 1607 central daylight time, N1972M, a Piper Mirage PA-46-350P airplane, experienced a landing gear collapse following a loss of directional control on landing at the DuPage County Airport (DPA), West Chicago, Illinois. The commercial pilot and passenger were not injured. The airplane received substantial damage to the firewall and wings. The airplane was registered to General Leasing of Michigan LLC and was operated by the pilot/owner as a 14 Code of Federal Regulations Part 91 business flight. Visual meteorological conditions prevailed for the flight, which operated on an instrument flight rules flight plan. The flight originated from the DuPont-Lapeer Airport (D95), Lapeer, Michigan, about 1430.

The pilot stated that he received a gear down and locked indication when he lowered the landing gear and during the approach. He stated the landing was smooth and as soon as the nose gear touched down, the airplane "yanked severely to the left." He attempted to maintain control, but the airplane ultimately traveled into the grass off the left side of the runway. The right wing contacted an airport sign and the landing gear collapsed.

A postaccident examination revealed that the nose gear actuator attachment was fractured in two places. Further examination revealed that the fracture surfaces and deformation pattern were indicative of overstress separations at both locations. No preexisting cracking was noted.

The nose gear position switch is located on the nose gear actuator. As the nose gear retracts, the steering linkage separates from the gear so that movement of the rudder pedals does not move the position of the nose gear. The nose gear is designed to rotate 90 degrees to stow in the retracted position. The nose gear actuator is bolted to the lower aft engine mount, which is constructed of welded tubes. The nose gear actuator extends from the engine mount and attaches to the nose landing gear.

Piper Aircraft Service Bulletin 1103D dated February 2, 2011, was current at the time of the accident. The service bulletin addressed engine mount inspection intervals for PA-46-310P, PA-46-350P and PA-46-350T airplanes as a result of several accidents and incidents where cracks developed on the engine mount in the area of the nose gear actuator attachment. For the accident airplane, the service bulletin required the first engine mount inspection to be accomplished at 740 hours of time in service, and thereafter at a frequency not to exceed 100 hours of time in service. The accident airplane had 550 hours of time in service when the accident occurred, thus it was 190 hours below the initial inspection time requirement.

On June 5, 2014, subsequent to the accident, Piper Aircraft updated the service bulletin reducing the initial inspection time to 200 hours of time in service and thereafter at intervals not to exceed 100 hours of time in service. The service bulletin also stated that Piper Aircraft had redesigned the engine mount and if the new engine mount was installed, the inspections could be eliminated.

On April 8, 2010 the National Transportation Safety Board had issued Safety Recommendation A-10-44 and -45, suggesting that the Federal Aviation Administration: 1) require repetitive inspections for fatigue cracks on all PA-46-310 and -350P airplanes, and 2) require Piper Aircraft to redesign the PA-46-310 and -350P engine mounts so that they would not be susceptible to fatigue cracking.

Pilot Information

Certificate:	Commercial	**Age:**	60,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	May 20, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	640 hours (Total, all aircraft), 357 hours (Total, this make and model), 604 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N1972M
Model/Series:	PA 46-350P	**Aircraft Category:**	Airplane
Year of Manufacture:	2012	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4636524
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	January 17, 2014 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	46 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	537.5 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:		**Engine Model/Series:**	TIO-540-AE2A
Registered Owner:	GENERAL LEASING OF MICHIGAN LLC	**Rated Power:**	350 Horsepower
Operator:	GENERAL LEASING OF MICHIGAN LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DPA,759 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	16:10 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 10000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	14 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lapeer, MI (D95)	**Type of Flight Plan Filed:**	IFR
Destination:	West Chicago, IL (DPA)	**Type of Clearance:**	VFR
Departure Time:	15:30 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	DuPage County Airport DPA	**Runway Surface Type:**	Concrete
Airport Elevation:	759 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	20R	**IFR Approach:**	None
Runway Length/Width:	7571 ft / 100 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	Unknown
Ground Injuries:	N/A	**Aircraft Explosion:**	Unknown
Total Injuries:	2 None	**Latitude, Longitude:**	41.908889,-88.249168

Administrative Information

Investigator In Charge (IIC):	Sullivan, Pamela
Additional Participating Persons:	Spencer Cull; FAA ; West Chicago, IL Michael McClure; Piper Aircraft; Vero Beach, FL Robert Martellotti; Piper Aircraft; Vero Beach, FL
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Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89051