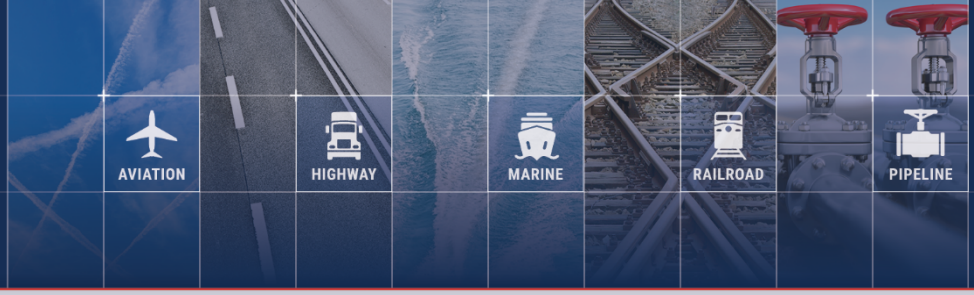

Aviation Investigation Final Report

Location:	Cameron Park, California	**Accident Number:**	WPR12LA261
Date & Time:	June 4, 2012, 18:25 Local	**Registration:**	N488EA
Aircraft:	PIPER AIRCRAFT INC PA46R-350T	**Aircraft Damage:**	Substantial
Defining Event:	Landing gear collapse	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During the landing roll after a normal touchdown, the nose landing gear collapsed, and the airplane departed the side of the runway. The investigation determined that the gear collapse was the result of the fatigue failure of the right side nose gear actuator attach foot, which then separated from the engine mount. Records showed that the accident airplane had been flown more than 300 hours since its most recent compliance with the Piper Aircraft service bulletin (SB) 1103D, which calls for the inspection of this specific area for cracks every 100 hours. Although Piper Aircraft Company considers its service bulletins to be mandatory actions, the Federal Aviation Administration does not require that service bulletins be complied with for aircraft that are used exclusively for 14 Code of Federal Regulations Part 91 operations, as this airplane was. Therefore, neither the owner of the airplane nor the maintenance personnel who performed annual inspections on the airplane were required to ensure compliance with SB 1103D. Failure to comply with SB 1103D could result in the nondetection of fatigue cracks that would eventually lead to the failure of a component of the engine mount/gear support assembly, as occurred in this accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The fatigue failure of the nose landing gear actuator attach foot during the landing roll. Contributing to the accident was the non-compliance with the manufacturer’s service bulletin.

Findings

Aircraft	Nose/tail gear attach section - Fatigue/wear/corrosion
Aircraft	Nose/tail gear attach section - Failure
Aircraft	Nose/tail gear attach section - Not inspected
Personnel issues	Scheduled/routine inspection - Not specified

Factual Information

History of Flight

Landing-landing roll	Landing gear collapse (Defining event)

On June 4, 2012, about 1825 Pacific daylight time, a Piper PA46R-350T, N488EA, experienced a collapse of the nose landing gear at Cameron Airpark, Cameron Park, California. The private pilot, who was the sole occupant, was not injured, but the airplane, which was owned and operated by the pilot, sustained substantial damage. The 14 Code of Federal Regulations Part 91 personal flight, which departed Palo Alto Airport, Palo Alto, California, about 55 minutes prior to the accident, was being operated in visual meteorological conditions. No flight plan had been filed.

According to the pilot, he made a normal uneventful landing, but during the landing roll the airplane's nose landing gear collapsed. After the collapse of the nose gear, the airplane temporarily departed the runway and encountered soft terrain, but the pilot was then able to bring it back onto the runway surface before it came to a stop. According to the Federal Aviation Inspector who responded to the scene, a part of the gear actuation and support system had separated from the location where it was attached to the engine mount, allowing the nose gear to partially retract, and resulting in a portion of the actuating system coming in contact with the firewall. The airplane was recovered to an on-field maintenance shop, where it underwent further examination. The examination of the airplane, which was under the direct supervision of a Federal Aviation Administration (FAA) Inspector assigned to the Sacramento Flight Standards District Office, revealed that the right side gear actuator attach foot had fractured and separated from the engine mount. The actuator then moved upward and aft, which allowed the nose landing gear to partially retract. As a result of the forces generated by the partial retraction of the nose landing gear, and the departure of the airplane from the runway, several engine mount braces were found either bent or broken. During this sequence of events, the engine firewall was substantially damaged. A field examination of the fractured metal tube revealed that a majority of the fracture face around its circumference showed a rough granular surface with a 45 degree fracture angle consistent with overload failure. A short section of the fracture, approximately 3/8 inch long, revealed the smoother shiny surface with beach marks and an area of pre-failure oxidation consistent with the propagation of a fatigue crack.

A review of the airframe log book indicated that Piper Aircraft Service Bulletin 1103D (SB 1103D), issued on February 2, 2011, concerning the repetitive 100-hour inspection of the engine mount assembly for cracks, was complied with during an Annual Inspection performed on March 15, 2011. At the time of that inspection the airplane had accumulated 617.6 total hours. According to the inspection log entry no defects were found. The aircraft received its next Annual Inspection on March 9, 2012, and according to the log book, at that time the

airplane had accumulated 888.3 total hours. The log book entry from that Annual Inspection did not reference any compliance actions associated with SB 1103D, and there were no other subsequent entries referencing compliance with SB 1103D in the airplane's log book. At the time of the accident, the airplane had accumulated 930 hours total time, and 313 hours since the last time SB 1103D was complied with.

The investigation determined that although Piper Aircraft Company considers their Service Bulletins to be mandatory actions, the FAA does not require that they be complied with for aircraft that are used exclusively for FAR Part 91 operations, as this airplane was. Therefore, neither the owner of the airplane or the maintenance shops performing the annual inspections were required to make sure the actions called for by SB 1103D were complied with. However, failure to comply with SB 1103D could create the situation where fatigue cracks that would have been detected during SB 1103D compliance actions might go undetected, and eventually lead to the failure of a component of the engine mount/gear support assembly.

Pilot Information

Certificate:	Private	**Age:**	46,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	August 17, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 11, 2012
Flight Time:	1953 hours (Total, all aircraft), 1002 hours (Total, this make and model), 1872 hours (Pilot In Command, all aircraft), 48 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	PIPER AIRCRAFT INC	**Registration:**	N488EA
Model/Series:	PA46R-350T	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4692016
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 9, 2012 Annual	**Certified Max Gross Wt.:**	4358 lbs
Time Since Last Inspection:	42 Hrs	**Engines:**	1
Airframe Total Time:	930 Hrs at time of accident	**Engine Manufacturer:**	
ELT:	C126 installed, not activated	**Engine Model/Series:**	
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 3000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Palo Alto, CA (KPAO)	**Type of Flight Plan Filed:**	IFR
Destination:	Cameron Park, CA (061)	**Type of Clearance:**	IFR;VFR flight following
Departure Time:	17:30 Local	**Type of Airspace:**	

Airport Information

Airport:	Cameron Airpark 061	**Runway Surface Type:**	Asphalt
Airport Elevation:	1286 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	13	**IFR Approach:**	None
Runway Length/Width:	4051 ft / 50 ft	**VFR Approach/Landing:**	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:**	38.683612,-120.985832(est)

Administrative Information

Investigator In Charge (IIC):	Anderson, Orrin
Additional Participating Persons:	James Nelson; Sacramento FSDO; Sacramento, CA
Original Publish Date:	March 13, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=83961