Aviation Investigation Final Report

Location:	Reno, Nevada	**Accident Number:**	WPR19LA098
Date & Time:	March 17, 2019, 08:10 Local	**Registration:**	N5028P
Aircraft:	Piper PA 24	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

At the conclusion of an uneventful flight, the pilot verified that the landing gear were down and locked after he observed a green indication on the instrument panel. During landing, the airplane touched down normally on the main landing gear but veered left when the nose landing gear contacted the runway, and departed the runway edge. The left wing impacted an airport sign and the airplane spun to the left. As the airplane slid in gravel, the nose landing gear and right main landing gear collapsed, substantially damaging the airplane.

The accident pilot purchased the airplane several months before the accident after the airplane had been parked mostly outside for 27 years. He flew the airplane about 15 hours before the accident flight. Postaccident examination of the nose landing gear revealed that the assembly was mostly intact except for the engine mount, which had failed where it supported the nose landing gear. The engine mount tubes displayed moderate to heavy corrosion deposits and wall thinning. The investigation could not determine the exact order in which the tubes failed; however, as the tubes were integral to the nose landing gear support, it is likely that the corrosion and wall thinning decreased the strength of the tubes and resulted in their failure when the nose landing gear was under load after touchdown. As the investigation did not find any preimpact anomalies with the nose landing gear steering system, the engine mount failure likely compromised the pilot's steering capabilities after touchdown before the collapse occurred. As the wear and corrosion on the tubes was mostly internal, it could not be determined whether the mechanic who most recently serviced the airplane would have recognized their condition.

Probable Cause and Findings

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

Failure of the engine mount due to internal corrosion and wall thinning, which resulted in a loss of directional control and nose gear collapse during landing.

Findings

Aircraft	Nose/tail landing gear - Failure
Aircraft	Nose/tail landing gear - Fatigue/wear/corrosion

Factual Information

History of Flight

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

On March 17, 2019, about 0810 Pacific daylight time, a Piper PA-24 airplane, N5028P, was substantially damaged when it was involved in an accident near Reno, Nevada. The private pilot and two passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot extended the landing gear shortly after entering the traffic pattern for landing and observed a green indication, which confirmed that the landing gear was down and locked. The airplane touched down normally on the main landing gear, but after the nose landing gear contacted the runway surface, the airplane veered to the left. The pilot stated that he corrected the airplane's direction, but the airplane then began to veer right of the runway centerline. He used the airplane's hand brake to decelerate while he attempted to return the airplane to the runway centerline, and the airplane veered to the left again and departed the left runway edge. The left wing impacted a runway distance remaining sign and the airplane spun to the left. As the airplane began to slide on its right side in gravel, the nose landing gear and right main landing gear collapsed before the airplane came to rest near the edge of a taxiway.

The airplane sustained substantial damage to the left wing and the stabilator. Additionally, the engine mount, which attached to the nose landing gear, had fractured.

According to logbook records, the airplane's most recent annual inspection was completed on October 23, 2018, at a total time of 3,563 flight hours. The preceding annual inspection was performed on March 3, 2011, at which time the airplane had accrued 3,545 flight hours. The airplane had accumulated about 15 total flight hours since its most recent inspection. According to the most recent annual inspection logbook entry, a gear retraction test was performed, and the gear warning horn was replaced. The mechanic who performed this service did not indicate if additional segments of the landing gear system were inspected.

The mechanic who recently serviced the accident airplane reported that his father had owned the airplane since the 1980s. After 1991, the airplane was parked, likely outside, until 2010, when it received an annual inspection and completed a round-trip flight to Los Angeles, California. The airplane was then parked outside and did not fly again until October 2018 when the accident pilot purchased it.

The engine mount connected both the nose landing gear and engine to the firewall, and the nose landing gear was connected to the engine mount through the oleo strut housing. Most of the nose landing gear assembly was intact with the exception of the left engine mount tubes, which were fractured. The tubes

are represented in Figure 1 as 1, 2, 3, and 4 (the trunnion). According to a representative of the airplane manufacturer, this engine mount supported the nose landing gear.

A visual inspection of the nose landing gear assembly showed that the nose bell crank and nosewheel steering rods were intact. Additionally, the shimmy dampener displayed a slight bend, but still provided resistance when actuated by hand.

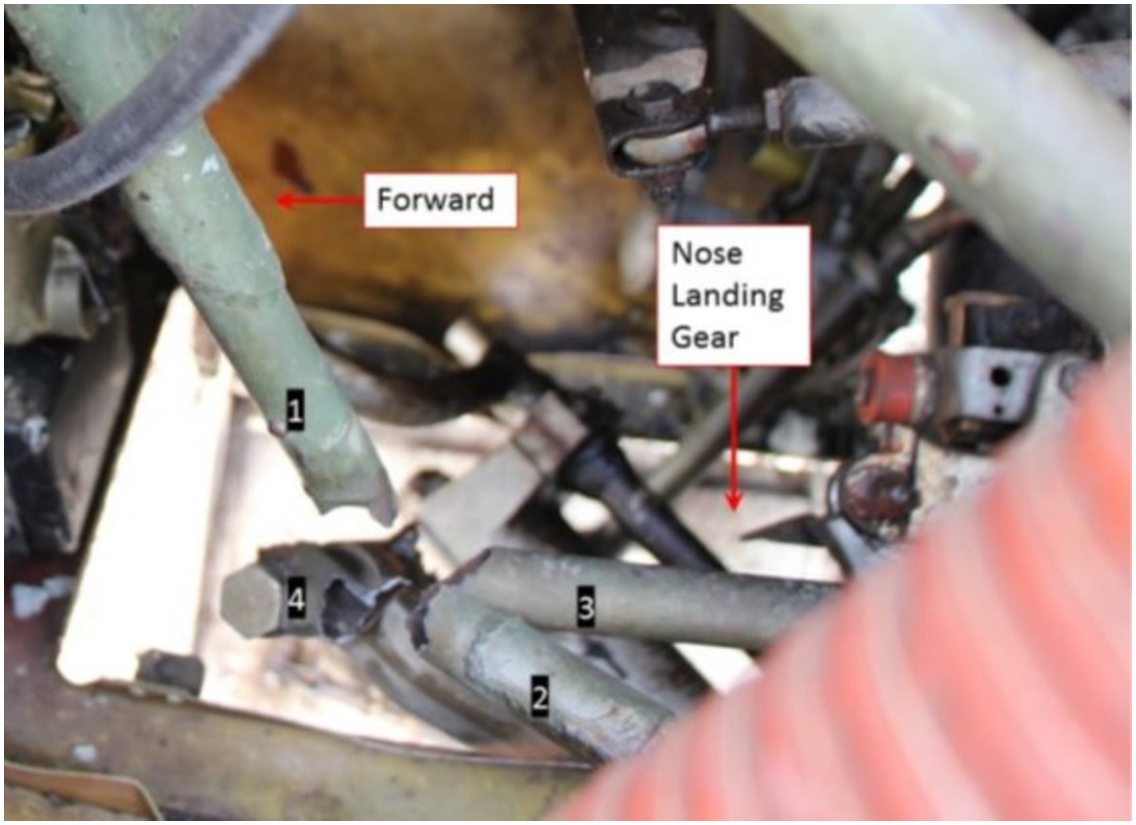

Figure 1: Nose Landing Gear Engine Mount Tubes and Trunnion

Portions of the engine mount were submitted to the NTSB Materials Laboratory for analysis. Each engine mount fracture surface was non-planar and rough, consistent with overstress. Moderate to heavy corrosion products were observed on the inner surfaces of each tube and several tubes displayed evidence of wall thinning from the internal corrosion. The exact order that the tubes failed could not be determined.

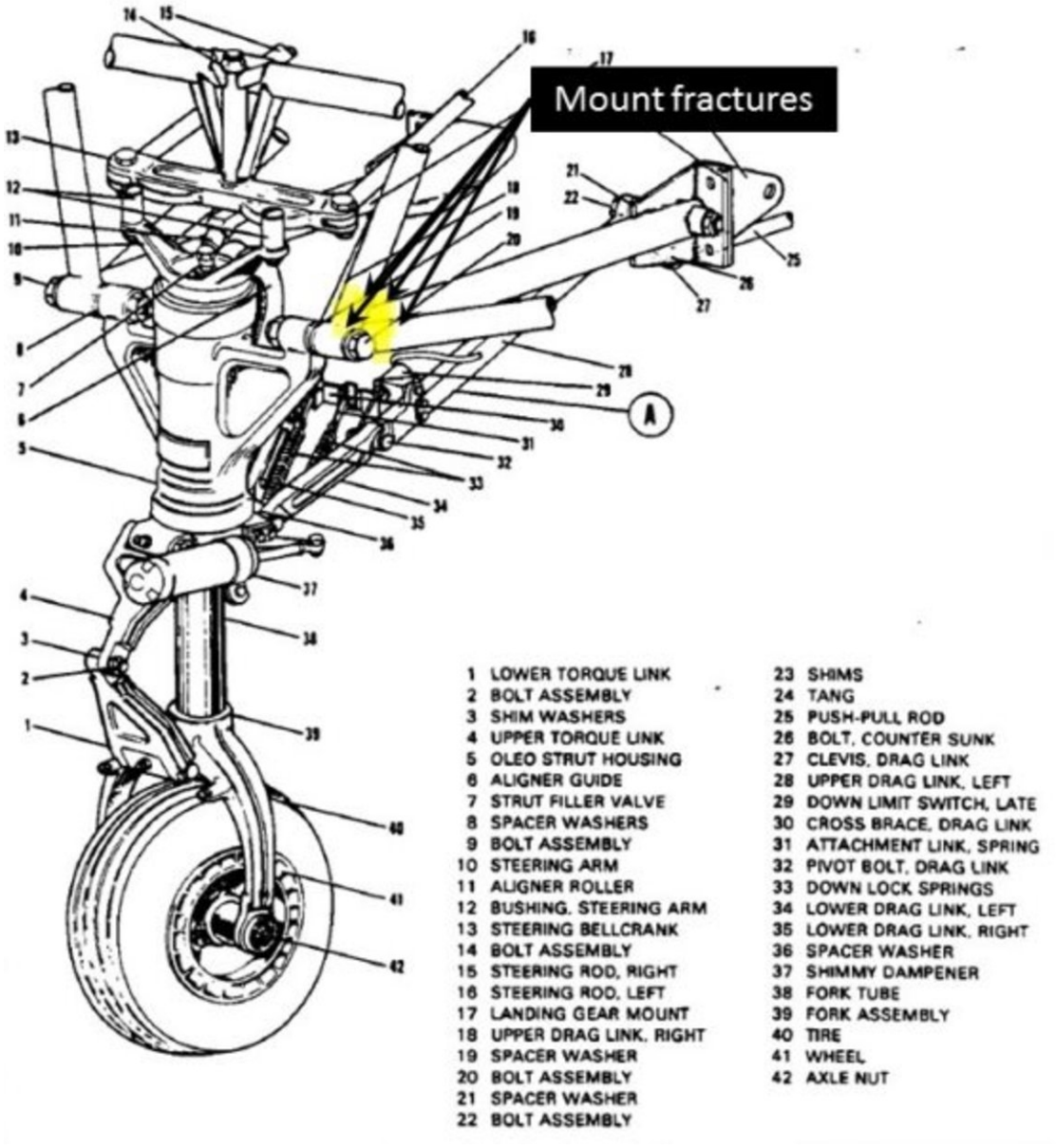

Figure 2: Location of Mount Fractures on NLG Assembly

Pilot Information

Certificate:	Private	**Age:**	65,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	January 2, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 24, 2019
Flight Time:	304 hours (Total, all aircraft), 14 hours (Total, this make and model), 270 hours (Pilot In Command, all aircraft), 11 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5028P
Model/Series:	PA 24 Undesignat	**Aircraft Category:**	Airplane
Year of Manufacture:	1958	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-31
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 23, 2018 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:	15 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3578 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-360-A1A
Registered Owner:	On file	**Rated Power:**	180 Horsepower
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:	5050 ft msl	**Distance from Accident Site:**	
Observation Time:	08:15 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.2 inches Hg	**Temperature/Dew Point:**	-2°C / -5°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Carson City, NV (CXP)	**Type of Flight Plan Filed:**	None
Destination:	Reno, NV (RTS)	**Type of Clearance:**	VFR flight following
Departure Time:	07:45 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Reno/Stead RTS	**Runway Surface Type:**	Asphalt
Airport Elevation:	5050 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	7608 ft / 150 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	39.669998,-119.879997

Administrative Information

Investigator In Charge (IIC):	Stein, Stephen
Additional Participating Persons:	Donald F Morgan; Federal Aviation Administration; Reno, NV Jon Hirsch; Piper Aircraft Company; Vero Beach, FL
Original Publish Date:	May 3, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99141