



Aviation Investigation Final Report

Location:	Petersburg, West Virginia	Accident Number:	ERA19LA086
Date & Time:	November 18, 2018, 12:47 Local	Registration:	N88VZ
Aircraft:	Piper PA46	Aircraft Damage:	Substantial
Defining Event:	Loss of control on ground	Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was landing the airplane with the yaw damper off, the rudder trim near neutral, and both rudder pedals centered. The pilot reported feeling the airplane slide after touchdown, similar to being on an ice patch, but did not recall if the nose landing gear was on the runway before or at the time of the slide. He immediately applied right rudder and brake to maintain directional control. As the airplane started to veer to the left, he moved the power lever into beta to slow the airplane but was unable to keep the airplane on the runway surface. The airplane departed the left side of the runway and impacted a small berm, resulting in a nose landing gear collapse. The pilot subsequently walked the runway and did not see any ice but observed rubber transfer marks from the right main and nose landing gear tires.

The nose and main landing gear tire pressures at the time of the accident could not be confirmed although there was no evidence of sidewall scuffing or slippage of the nose landing tire or tube. The nose landing gear rake angle could not be determined due to damage, but the nose landing gear steering bungee appeared intact.

Although the collar of the nose landing gear trunnion was damaged, and the nose landing gear rake angle was set to 0.1° less than the minimum specified at the last annual inspection, neither of those conditions likely contributed to the on-ground loss of control. The reason for the runway excursion could not be determined based on the available evidence.

Probable Cause and Findings

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

A loss of control during the landing roll and subsequent runway excursion for reasons that could not be determined based on the available evidence.

Findings

Not determined	(general) - Unknown/Not determined
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Factual Information

History of Flight

Landing-landing roll	Loss of control on ground (Defining event)
Landing-landing roll	Runway excursion
Landing-landing roll	Landing gear collapse

On November 18, 2018, about 1247 eastern standard time, a Piper PA-46-350P, N88VZ, was substantially damaged when it was involved in an accident near Petersburg, West Virginia. 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 stated that he entered an extended right base leg of the airport traffic pattern for runway 13, where he lowered the flaps to 10° and extended the landing gear. He then extended the flaps to 20° and turned onto final approach for runway 13 while maintaining 103 knots indicated airspeed, adding that the wind was calm. He confirmed that the landing gear position indicator lights were illuminated green on final approach and did not recall if he lowered the flaps to 36°.

The pilot further stated that, before touchdown, the yaw damper was off, the rudder trim was near neutral, and both rudder pedals were centered. The main landing gear touched down smoothly in the landing zone, and he then felt the airplane slide, similar to being on an ice patch. He did not recall if the nose landing gear was on the runway before or at the time of the slide. He immediately applied right rudder and brake to maintain directional control, and as the airplane started to veer to the left, he moved the power lever into beta to slow the airplane; however, he was unable to keep the airplane on the runway with rudder input. The airplane departed the left side of the runway, impacted a small berm, and the nose landing gear collapsed. The airplane came to rest upright with the engine running. After securing the airplane, he walked the runway and did not see any ice but did see "solid rubber marks on the runway showing the nose gear leaving a solid thick line of rubber."

Pilot Information

Certificate:	Private	Age:	62, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-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 3 With waivers/limitations	Last FAA Medical Exam:	September 5, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	November 13, 2017
Flight Time:	2248 hours (Total, all aircraft), 223 hours (Total, this make and model), 2038 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N88VZ
Model/Series:	PA46 350P	Aircraft Category:	Airplane
Year of Manufacture:	1998	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	4636170
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	July 11, 2018 Annual	Certified Max Gross Wt.:	4300 lbs
Time Since Last Inspection:	55 Hrs	Engines:	1 Turbo prop
Airframe Total Time:	2653.9 Hrs as of last inspection	Engine Manufacturer:	Pratt & Whitney
ELT:	C126 installed, not activated	Engine Model/Series:	PT6A-35
Registered Owner:		Rated Power:	560 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

In August 2008, the airplane was modified in accordance with Supplemental Type Certificate (STC) ST00541SE with the installation of a 560 shaft horsepower Pratt & Whitney PT6A-35 engine and a Hartzell HC-E4N-3N/D8292B-Z constant-speed, full manual feathering, reversible, four-bladed propeller.

According to the STC holder, the nose landing gear actuator, nose landing gear assembly, nose landing gear steering system components including the nose landing gear steering bungee, and the nose landing gear rake angle were not changed as a result of the modification.

Review of the maintenance records revealed that the airplane's last annual inspection was on

July 11, 2018. The entry for the inspection indicated that the nose landing gear rake angle was adjusted to 89.9° (specification is 90.0° to 090.5°), and the nose gear steering free play was also adjusted. The entry also indicated that a new nose landing gear tire, P/N 560-04-112, and tube were installed. The airplane had accumulated about 55 hours since the inspection at the time of the accident.

The pilot did not report any issues related to engine or propeller control rigging since the annual inspection was completed.

Nose wheel steering is performed by actuation of either rudder pedal at the rudder bar assembly, which is connected by push/pull rods to a steering bellcrank. A single push/pull rod connects the steering bellcrank to a bungee, which is then connected by a single push/pull rod to a steering arm above the nose landing gear trunnion assembly. Rudder primary control input was also performed by actuation of the rudder pedals, which were connected by control cables.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	W99,963 ft msl	Distance from Accident Site:	3 Nautical Miles
Observation Time:	12:55 Local	Direction from Accident Site:	186°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	None / None
Wind Direction:		Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.2 inches Hg	Temperature/Dew Point:	4°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Llano, TX (AQO)	Type of Flight Plan Filed:	IFR
Destination:	Petersburg, WV (W99)	Type of Clearance:	IFR
Departure Time:	09:01 Local	Type of Airspace:	

Airport Information

Airport:	Grant County Airport W99	Runway Surface Type:	Asphalt
Airport Elevation:	963 ft msl	Runway Surface Condition:	Dry
Runway Used:	13	IFR Approach:	None
Runway Length/Width:	5000 ft / 75 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:	38.995555,-79.145835(est)

According to the Federal Aviation Administration (FAA) inspector who examined the runway and airplane, the airplane came to rest on airport property partially in a ditch about 2,430 ft from the approach end of runway 13 and about 120 ft north of the northern edge of runway 13. The main landing gear were extended and the nose landing gear was collapsed. All propeller blades exhibited varying amounts of blade bending.

Review of pictures and video provided by the pilot revealed two parallel skid marks on the runway. The first identifiable mark was left of the runway centerline immediately adjacent to a paving seam. The mark continued for a short distance paralleling the runway centerline, while the second mark was located slightly farther down the runway near the runway centerline. Both marks began arching to the left and continued to the northern edge of the runway; the markings showed a sharper radius left turn near the edge of the runway. Two ground scars continued on the grass north of the runway, and in the grass, a third ground scar left of the left-most ground scar was noted. According to a picture provided by the pilot, damage to the collar of the nose landing gear trunnion was noted.

The airplane was transported to a repair station where repairs were performed, which included removal of the propeller, engine, and nose landing gear assembly. According to personnel of the facility, rigging checks of the engine or propeller controls were not performed, and a check of the nose landing gear steering rake angle could not be performed due to damage. The main and nose landing gear tire pressures were not determined. There was no evidence of scuffing of the nose landing gear tire sidewall, nor was there evidence of slippage of the nose landing tire or tube on the wheel. The bolt that secured the nose landing gear actuator to the engine mount was fractured, consistent with shear. The nose landing gear steering bungee was intact with no evidence of preimpact failure or malfunction.

According to a representative of the airframe manufacturer, the damage to the collar of the nose landing gear trunnion was associated with contact by a lug of the nose landing gear oleo caused by overtravel of the nose landing gear tire to the airplane nose-right position.

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy		
Additional Participating Persons:	Steven O'Rourke; FAA/FSDO; Charleston, WV		
Original Publish Date:	March 16, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98886		

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