



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Mesa, Arizona	<b>Accident Number:</b>	WPR23LA096
<b>Date &amp; Time:</b>	January 23, 2023, 16:30 Local	<b>Registration:</b>	N9534A
<b>Aircraft:</b>	Cessna 170	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control on ground	<b>Injuries:</b>	3 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

The pilot receiving instruction was conducting takeoffs and landings to regain tailwheel currency. During the second landing's roll out, the airplane began to veer left of the runway centerline. The pilot applied correction with right rudder; however, he overcorrected and the airplane veered to the right. The pilot and the flight instructor both applied left rudder and brake to counteract the veer to the right. However, the veer to the right developed into a ground loop and the left main landing gear leg fractured. The airplane dropped onto the fractured end of the landing gear leg and came to rest upright.

A metallurgical examination of the fractured landing gear leg revealed small fatigue cracks along the radius of the brake line retainer clip bore and outboard face. These small fatigue cracks concentrated stress in the radius, facilitating a premature overstress fracture due to the stresses on the part during the landing.

## Probable Cause and Findings

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

The pilot's failure to maintain directional control during the landing roll out and the preexisting fatigue cracks in the left main landing gear leg, which resulted in the leg's premature overstress fracture during the ground loop.

## Findings

<b>Aircraft</b>	Directional control - Not attained/maintained
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Aircraft</b>	Main landing gear - Failure
<b>Aircraft</b>	Main landing gear - Fatigue/wear/corrosion

# Factual Information

## History of Flight

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

On January 23, 2023, about 1630 mountain standard time, a Cessna 170A, N9534A, sustained substantial damage when it was involved in an accident near Mesa, Arizona. The pilot, flight instructor, and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the pilot receiving instruction, he was conducting takeoffs and landings to regain tailwheel currency. During the landing roll after the second landing, the airplane began to veer to the left. He applied correction with right rudder; however, he overcorrected and the airplane veered to the right. The pilot receiving instruction and the flight instructor both applied left rudder and brake to counteract the veer to the right. Despite their corrections, the airplane ground looped to the right. During the ground loop, the left main landing gear leg fractured mid span, near the brake line retainer clip bore, and the left wing contacted the runway surface.

Postaccident examination and fracture analysis of the left main landing gear leg was conducted by the National Transportation Safety Board Materials Laboratory. The examination revealed that the landing gear failed in its final landing due to small fatigue cracks present along the radius of the retainer clip bore and the outboard face. Outside the fatigue cracks, the fracture surface exhibited features consistent with overstress fracture. The fatigue cracks initiated at small corrosion pits along the radius of the bore, and propagated until the final landing, when the remainder of the leg fractured from overstress.

## Pilot Information

<b>Certificate:</b>	Airline transport; Commercial	<b>Age:</b>	70,Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Glider	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	April 27, 2021
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	January 21, 2023
<b>Flight Time:</b>	(Estimated) 17654 hours (Total, all aircraft), 1 hours (Total, this make and model), 16556 hours (Pilot In Command, all aircraft), 6 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

## Flight instructor Information

<b>Certificate:</b>	Airline transport; Commercial; Flight instructor	<b>Age:</b>	69,Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea; Multi-engine land; Multi-engine sea	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Airship	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 1 With waivers/limitations	<b>Last FAA Medical Exam:</b>	October 5, 2022
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	November 16, 2022
<b>Flight Time:</b>	(Estimated) 27000 hours (Total, all aircraft), 27 hours (Total, this make and model), 20000 hours (Pilot In Command, all aircraft), 41 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

## Passenger Information

<b>Certificate:</b>		<b>Age:</b>	
<b>Airplane Rating(s):</b>		<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	Lap only
<b>Instrument Rating(s):</b>		<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>		<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	UNK	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N9534A
<b>Model/Series:</b>	170 A	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1949	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	19095
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	August 10, 2022 Annual	<b>Certified Max Gross Wt.:</b>	2200 lbs
<b>Time Since Last Inspection:</b>	38 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	4102 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	O-300-D
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	145 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KIWA, 1384 ft msl	<b>Distance from Accident Site:</b>	0 Nautical Miles
<b>Observation Time:</b>	16:31 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	7000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 7000 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	3 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	240°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	29.98 inches Hg	<b>Temperature/Dew Point:</b>	8°C / -8°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Mesa, AZ	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Mesa, AZ	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	Phoenix-Mesa Gateway KIWA	<b>Runway Surface Type:</b>	Concrete
<b>Airport Elevation:</b>	1384 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	12L	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	9300 ft / 150 ft	<b>VFR Approach/Landing:</b>	Stop and go;Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	3 None	<b>Latitude, Longitude:</b>	33.31,-111.66

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Blocher, Kristyn
<b>Additional Participating Persons:</b>	Darren Henley; FAA; Scottsdale, AZ
<b>Original Publish Date:</b>	May 14, 2024
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=106627">https://data.nts.gov/Docket?ProjectID=106627</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).