Aviation Investigation Final Report

Location:	Mesa, Arizona	**Accident Number:**	WPR23LA096
Date & Time:	January 23, 2023, 16:30 Local	**Registration:**	N9534A
Aircraft:	Cessna 170	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	3 None
Flight Conducted Under:	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

Aircraft	Directional control - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Aircraft	Main landing gear - Failure
Aircraft	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

Certificate:	Airline transport; Commercial	**Age:**	70,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	April 27, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 21, 2023
Flight Time:	(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

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	69,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land; Multi-engine sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Airship	**Restraint Used:**	3-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	October 5, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 16, 2022
Flight Time:	(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

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

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N9534A
Model/Series:	170 A	**Aircraft Category:**	Airplane
Year of Manufacture:	1949	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	19095
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	August 10, 2022 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:	38 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4102 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	O-300-D
Registered Owner:	On file	**Rated Power:**	145 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:	KIWA,1384 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	16:31 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	7000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	8°C / -8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Mesa, AZ	**Type of Flight Plan Filed:**	None
Destination:	Mesa, AZ	**Type of Clearance:**	VFR
Departure Time:		**Type of Airspace:**	Class D

Airport Information

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

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Blocher, Kristyn
Additional Participating Persons:	Darren Henley; FAA; Scottsdale, AZ
Original Publish Date:	May 14, 2024
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=106627