Aviation Investigation Final Report

Location:	Cortez, Colorado	**Accident Number:**	CEN23LA208
Date & Time:	May 18, 2023, 18:00 Local	**Registration:**	N2515K
Aircraft:	Luscombe 8E	**Aircraft Damage:**	Substantial
Defining Event:	Landing gear collapse	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The conventional geared airplane's right main landing gear collapsed during landing and the airplane's left wing sustained substantial damage. The pilot reported that the flight instructor performed the final landing and that the landing was very hard. The flight instructor reported that he landed on centerline and as the airplane was rolling out the right main landing gear collapsed. He noted that there were no brakes in the right seat pilot station where he was located.

Metallurgical examination of the failed landing gear revealed corrosion on the inside of the main landing gear tube in the area where it was welded to the wheel axle. The corrosion progressively thinned the leg tube walls over time and caused pitting and microcracking on the tube interior. The combination of missing material, pitting, and microcracks led to an overstress fracture of the leg at this location on the final landing, which led to two other subsequent overstress fractures.

The Federal Aviation Administration issued a special airworthiness information bulletin (SAIB), CE-17-14, to alert operators of this and other similar model airplanes of the need to inspect and address corrosion issues on main landing gear. The SAIB recommended following the procedures of the Don Luscombe Aviation History Foundation Service Recommendation No. 4, dated Jan. 22, 1996, which provided instructions for installing a drain hole in the lower portion of the leg, performing repetitive inspections of the gear legs for corrosion, and cleaning and sealing the gear legs' internal surfaces. Compliance with the SAIB is not mandatory.

Limited maintenance records were available during the investigation; however, the most recent annual inspection entry did not indicate that the landing gear were inspected for corrosion. The

fractured main landing gear did not have drain holes as noted in the service recommendation, indicating that that procedures in the service recommendation had not been performed.

Based on the available evidence the accident was the result of failure of the right main landing gear leg due to weakening from prolonged internal corrosion of the landing gear tube, which weakened the leg.

Probable Cause and Findings

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

Failure of the right main landing gear due to prolonged corrosion of the landing gear tube, which weakened the gear.

Findings

Aircraft	Main landing gear - Fatigue/wear/corrosion
Aircraft	Main landing gear - Failure

Factual Information

History of Flight

Landing-flare/touchdown	Landing gear collapse (Defining event)

On May 18, 2023, about 1800 mountain daylight time, a Luscombe 8E, N2515K, was substantially damaged when it was involved in an accident at the Cortez Municipal Airport (CEZ), Cortez, Colorado. The pilot and the flight instructor were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight.

The airplane was recently purchased by the pilot and delivered to CEZ by the flight instructor. After delivery, the pilot and flight instructor conducted flights over several days to familiarize the pilot with the airplane.

According to the pilot, during the accident flight he conducted several landings without incident. The final takeoff and landing were conducted with the flight instructor manipulating the airplane's flight controls. He said that the final landing was "very hard."

The flight instructor reported that he landed on the runway centerline and as the airplane was rolling out, the right main landing gear collapsed. He noted that the right seat position, where he was seated, did not have brakes installed. During the landing, the right main landing gear collapsed. The airplane's left wing was substantially damaged during the landing.

The failed right main landing gear was examined by the National Transportation Safety Board Materials Laboratory. Examination of the failed landing gear revealed corrosion on the inside of the main landing gear tube in the area where it was welded to the wheel axle. The corrosion progressively thinned the leg tube walls over time and caused pitting and microcracking on the tube interior. The combination of missing material, pitting, and microcracks led to an overstress fracture of the leg at this location on the final landing, which led to two other subsequent overstress fractures. The tube thickness near the fracture had thinned from 0.040 inches to 0.025 inches.

On June 5, 2017, the Federal Aviation Administration (FAA) issued a special airworthiness information bulletin (SAIB), CE-17-14, to alert operators of several models of JGS Properties LLC and Luscombe airplanes, including the model 8E, of a need for inspection to detect and correct corrosion inside the main landing gear legs. According to the bulletin, internal surface treatment and regular inspection of the lower legs may help mitigate the corrosion related gear failures. Compliance with a FAA SAIB is not mandatory for 14 *CFR* Part 91 operations.

The FAA recommended that owners and operators of the affected airplanes follow the inspection procedures outlined in The Don Luscombe Aviation History Foundation Service

Recommendation No. 4, dated Jan. 22, 1996, which provided instructions for installing a drain hole in the lower portion of the leg, performing repetitive inspections of the gear legs for corrosion, and cleaning and sealing the gear legs' internal surfaces. The accident airplane did not appear to have a drain hole in this portion of the lower leg. The FAA also urged using X ray or ultrasound inspection methods on the leg-to-axle joint to detect internal rust during initial or follow-on inspections of the gear leg.

Limited maintenance records were available during the investigation; however, the most recent annual inspection entry did not indicate that the landing gear were inspected for corrosion. The fractured main landing gear did not have drain holes as noted in the service recommendation.

Flight instructor Information

Certificate:	Airline transport; Commercial	**Age:**	Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	November 16, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	24064 hours (Total, all aircraft), 1402 hours (Total, this make and model), 38 hours (Last 90 days, all aircraft), 26 hours (Last 30 days, all aircraft)		

Pilot Information

Certificate:	Private	**Age:**	86,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	BasicMed	**Last FAA Medical Exam:**	January 1, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	5000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Luscombe	**Registration:**	N2515K
Model/Series:	8E	**Aircraft Category:**	Airplane
Year of Manufacture:	1947	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	5242
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	1400 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	C85
Registered Owner:	On file	**Rated Power:**	85 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:	KCEZ,5903 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	17:53 Local	**Direction from Accident Site:**	22°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	23°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Cortez, CO	**Type of Flight Plan Filed:**	None
Destination:	Cortez, CO	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class E

Airport Information

Airport:	CORTEZ MUNI CEZ	**Runway Surface Type:**	Asphalt
Airport Elevation:	5917 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	21	**IFR Approach:**	None
Runway Length/Width:	7205 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	37.303002,-108.62804

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Wesley Dollahite; FAA - Denver FSDO; Denver, CO
Original Publish Date:	March 28, 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=192255