



Aviation Investigation Final Report

Location:	Long Beach, California	Accident Number:	WPR22LA159
Date & Time:	April 19, 2022, 15:38 Local	Registration:	N822SA
Aircraft:	DIAMOND AIRCRAFT IND INC DA 42	Aircraft Damage:	Substantial
Defining Event:	Landing gear collapse	Injuries:	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot receiving instruction performed a short-field landing to a runway. During the rollout, about 750 ft from the touchdown point, the right main landing gear collapsed, and the right wing contacted the runway, which resulted in substantial damage to the right aileron.

A postaccident inspection revealed the right main landing gear brace rib had separated from the wing structure. Examination of the failed components revealed the separation did not occur due to faulty adhesion from the original installation. In addition, an 8- to 10-inch crack was discovered between the upper and lower wing skin bonds to the airplane’s center section spar. That crack would have resulted from some type of force or stress to the airplane, such as a hard landing. However, no hard landings in the airplane had been reported.

The airplane had undergone a 100-hour/annual inspection about 3 weeks before the accident, with no reports of damage or faults related to the landing gear. The airplane had been flown for about 35 hours since the inspection by multiple pilots. It is likely that the separation of the right main landing gear support assembly and the crack were initiated by a hard landing that was not reported since the inspection. The condition of the right main landing gear brace rib likely began to deteriorate and the right main landing gear subsequently collapsed during the accident flight.

Probable Cause and Findings

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

The failure of the right main landing gear brace rib for reasons that could not be determined based on available information.

Findings

Not determined	(general) - Unknown/Not determined
Aircraft	Main gear strut/axle/truck - Unknown/Not determined

Factual Information

History of Flight

Landing	Landing gear collapse (Defining event)
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On April 19, 2022, about 1538 Pacific daylight time, a Diamond Aircraft Inc. DA-42 airplane, N822SA, was substantially damaged when it was involved in an accident at Long Beach Airport (Daugherty Field), Long Beach, California. The flight instructor and the pilot receiving instruction were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The pilot receiving instruction reported that he was conducting a multiengine training flight and had performed multiple maneuvers before the accident. During the rollout after a short-field landing, about 750 ft from the touchdown point, the right main landing gear collapsed, and the right wing contacted the ground, which substantially damaged the right aileron. According to the flight instructor, the approach was normal, and the touchdown occurred with no sideloading. The flight instructor also stated that he checked the gear three times; the pilot receiving instruction checked it twice; and the gear appeared to be in the down and locked position, as indicated by the three green landing gear lights.

A representative from the Federal Aviation Administration (FAA), along with maintenance personnel from the operator, examined the airplane at the accident site and observed the composite right landing gear brace rib had separated from the wing structure.

Further examination of the airframe revealed the right main landing gear brace rib had separated from its attachment points at the spar and upper wing skin. The bonding paste material was still adhered to both the brace rib and the spar/wing skin attachment points, consistent with correct adhesion of the components. There was no evidence of faulty adhesion from the original installation. The examination also revealed an 8- to 10-inch crack between the upper and lower wing skin bonds to the airplane's center section spar.

A coin tap test and a visual examination revealed no cracks on the left main landing gear brace. A review of maintenance documents revealed that the latest service bulletins and airworthiness directives had been performed on the airplane. Also, the airplane had recently completed a 100-hour/annual inspection about 3 weeks before the accident, with no report of damaged or faulty components related to the landing gear.

The airplane had been flown for about 35 hours since the annual inspection by multiple pilots.

Student pilot Information

Certificate:	Student	Age:	65, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	December 24, 2020
Occupational Pilot:	No	Last Flight Review or Equivalent:	January 3, 2022
Flight Time:	1127 hours (Total, all aircraft), 26 hours (Total, this make and model), 1030 hours (Pilot In Command, all aircraft), 43 hours (Last 90 days, all aircraft), 26 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Flight instructor Information

Certificate:	Commercial; Flight instructor	Age:	25, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	Toxicology Performed:	
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	March 30, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 23, 2020
Flight Time:	1648 hours (Total, all aircraft), 446 hours (Total, this make and model), 1545 hours (Pilot In Command, all aircraft), 79 hours (Last 90 days, all aircraft), 17 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	DIAMOND AIRCRAFT IND INC	Registration:	N822SA
Model/Series:	DA 42	Aircraft Category:	Airplane
Year of Manufacture:	2006	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	42.AC006
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	March 31, 2022 Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:	35 Hrs	Engines:	2 Reciprocating
Airframe Total Time:	4164.5 Hrs at time of accident	Engine Manufacturer:	Austro
ELT:	Installed	Engine Model/Series:	E4-B
Registered Owner:	PUGHS AIR WEST LLC	Rated Power:	170
Operator:	PUGHS AIR WEST LLC	Operating Certificate(s) Held:	Pilot school (141)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	LGB,60 ft msl	Distance from Accident Site:	
Observation Time:	15:38 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	14 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.92 inches Hg	Temperature/Dew Point:	23°C / 0°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Long Beach, CA	Type of Flight Plan Filed:	None
Destination:	Long Beach, CA	Type of Clearance:	VFR
Departure Time:		Type of Airspace:	Class D

Airport Information

Airport:	Long Beach Airport (Daugherty Field) LGB	Runway Surface Type:	Asphalt
Airport Elevation:	60 ft msl	Runway Surface Condition:	Dry
Runway Used:	26L	IFR Approach:	None
Runway Length/Width:	3918 ft / 100 ft	VFR Approach/Landing:	Full stop

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:	33.816136,-118.14948

Administrative Information

Investigator In Charge (IIC):	Salazar, Fabian
Additional Participating Persons:	Marcus Giordano; Federal Aviation Administration; Long Beach, CA
Original Publish Date:	December 7, 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=104967

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](#).