



Aviation Investigation Final Report

Location:	San Diego, California	Accident Number:	WPR19LA114
Date & Time:	March 14, 2019, 17:30 Local	Registration:	N101GL
Aircraft:	Great Lakes 2T-1A-2	Aircraft Damage:	Substantial
Defining Event:	Flight control sys malf/fail	Injuries:	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

About 5 minutes after taking off, the pilot observed that the left upper aileron had come loose from the inboard hinge. The pilot returned to the departure airport and landed uneventfully. A postaccident examination of the airplane revealed that a wing rib aft of the spar at the outboard aileron cutout was substantially damaged.

Examination of the aileron hinge strap fracture surfaces revealed crack arrest marks and thumbnail-shaped patterns on the fracture surfaces, which emanated from both the top and bottom surfaces of the hinge strap. The fracture surfaces were consistent with asymmetric reverse-bending fatigue crack propagation.

The fatigue cracking propagated from the top and bottom surfaces through almost the entire cross-section of the hinge strap.

The pilot reported that while there were no inspection criteria from the manufacturer relative to the hinge straps, all hinge straps were inspected as part of each annual inspection.

Probable Cause and Findings

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

The fracture of the aileron hinge strap due to fatigue crack propagation, which resulted in substantial damage to a wing rib aft of the spar at the outboard aileron cutout. Contributing to the accident was inadequate maintenance inspection.

Findings

Aircraft

Aileron control system - Fatigue/wear/corrosion

Personnel issues

Scheduled/routine maintenance - Maintenance personnel

Factual Information

History of Flight

Enroute-climb to cruise	Flight control sys malf/fail (Defining event)
Emergency descent	Flight control sys malf/fail

On March 14, 2019, about 1730 Pacific daylight time, a Great Lakes 2T-1A-2 airplane, N101GL, sustained substantial damage when it was involved in an accident near San Diego, California. The private pilot and his passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

In a report submitted to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot reported that, about 5 minutes after takeoff, the left upper aileron came loose from the inboard hinge and remained attached by the one remaining hinge. The pilot returned to the departure airport and landed uneventfully.

Examination of the airplane revealed that a wing rib aft of the spar at the outboard aileron cutout was substantially damaged. The failed aileron hinge strap (two components) was secured by the NTSB IIC and sent to the NTSB Materials Laboratory for examination. The pilot mentioned that while there were no inspection criteria from the manufacturer relative to the hinge straps, all hinge straps were inspected as part of each annual inspection.

Examination of the aileron hinge strap fracture surfaces by the NTSB Materials Laboratory technician revealed crack arrest marks and thumbnail-shaped patterns on the fracture surfaces emanating from both the top and bottom surfaces of the hinge strap. The thumbnail-shaped patterns are ratchet marks and their presence on both the top and bottom surfaces is consistent with asymmetric reverse-bending fatigue crack propagation. The fatigue cracking propagated from the top and bottom surfaces through almost the entire cross-section of the hinge strap.

Pilot Information

Certificate:	Private	Age:	56, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	4-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:	August 1, 2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	1146 hours (Total, all aircraft), 155 hours (Total, this make and model), 960 hours (Pilot In Command, all aircraft), 28 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Great Lakes	Registration:	N101GL
Model/Series:	2T-1A-2	Aircraft Category:	Airplane
Year of Manufacture:	1975	Amateur Built:	
Airworthiness Certificate:	Aerobatic; Normal	Serial Number:	0714
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	August 30, 2018 Annual	Certified Max Gross Wt.:	1800 lbs
Time Since Last Inspection:	10 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	2412 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	C126 installed, not activated	Engine Model/Series:	AEIO-360-B1G6
Registered Owner:		Rated Power:	180
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:	MYF,427 ft msl	Distance from Accident Site:	
Observation Time:	17:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	280°	Turbulence Severity Forecast/Actual:	N/A / Light
Altimeter Setting:	29.92 inches Hg	Temperature/Dew Point:	18°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	San Diego, CA (MYF)	Type of Flight Plan Filed:	None
Destination:	San Diego, CA	Type of Clearance:	VFR
Departure Time:	16:56 Local	Type of Airspace:	Class E

Airport Information

Airport:	Montgomery-Gibbs Executive MYF	Runway Surface Type:	Asphalt
Airport Elevation:	427 ft msl	Runway Surface Condition:	Dry
Runway Used:	28R	IFR Approach:	None
Runway Length/Width:	4598 ft / 150 ft	VFR Approach/Landing:	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	32.815555,-117.13972

Administrative Information

Investigator In Charge (IIC):	Little, Thomas		
Additional Participating Persons:	Roger C Messick; Federal Aviation Administration; San Diego, CA		
Original Publish Date:	January 20, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=99276		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).