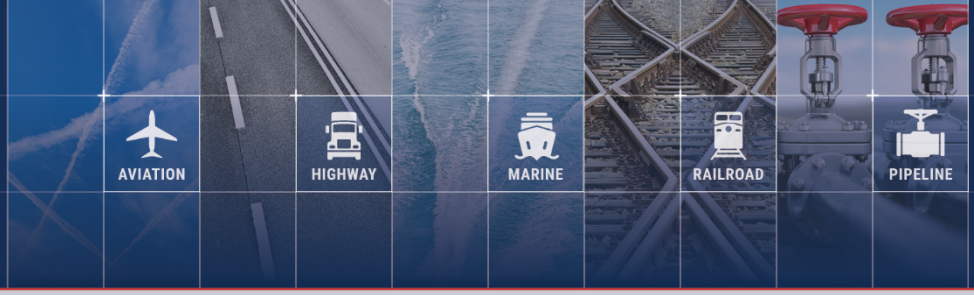

Aviation Investigation Final Report

Location:	Chino, California	**Accident Number:**	WPR24FA196
Date & Time:	June 15, 2024, 12:36 Local	**Registration:**	N93R
Aircraft:	Lockheed 12A	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The accident flight was conducted before a Father's Day event to prepare for a planned three-airplane formation flight later that day. During the morning briefing, the pilot and co-pilot were assigned to the accident airplane. A representative of the operator believed that the co-pilot extended the flaps during a functional test as part of the preflight inspection. Ground crew members subsequently observed the flaps extended during engine start and warned the flight crew using hand and arm signals; however, the flight crew did not acknowledge the warning. Witness observations indicated that the flaps remained fully extended during taxi and takeoff, and video evidence showed that the flaps remained extended during the initial climb.

The operator reported that crews commonly used reduced engine power on hot days to reduce engine oil temperatures and engine noise. After takeoff, the airplane climbed to approximately 200 to 300 ft above ground level (agl); it then pitched up, turned left, and entered a nose-down descent before impacting terrain. A postcrash fire ensued.

A video study determined that both engines continued to operate until impact and that their speeds ranged from approximately 1,978 rpm to 2,098 rpm, somewhat below the 2,200- to 2,300-rpm takeoff speed.

The pilot had cardiovascular disease, including moderate coronary artery disease, an implanted pacemaker/defibrillator, and obstructive sleep apnea (OSA) with continuous positive airway pressure (CPAP) device use. The FAA issued the pilot an Authorization for Special Issuance for a Second-Class medical certificate with permanent pacemaker implantation, atrial fibrillation, obstructive sleep apnea treated with CPAP and the use of medication.

The pilot's cardiovascular disease was associated with an increased risk of sudden impairment or incapacitating cardiovascular event such as ventricular arrhythmia, heart attack, or stroke. No forensic evidence indicated that such an event occurred. However, such events do not leave reliable autopsy evidence if the event occurs just before death, and no data were available from the pilot's implanted pacemaker/defibrillator. Thus, the investigation was unable to determine if sudden incapacitation or impairment was a factor in this accident.

Postaccident examination found no evidence of preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation. Flight control continuity from the cockpit controls to the primary flight control surfaces was established; the observed flight control cable separations were consistent with damage sustained during the accident sequence.

The airplane flight manual specified that the flaps should be in the Up position for takeoff. However, witnesses observed the airplane taxi and takeoff with the flaps fully extended. One witness reported that the airplane appeared to be moving extremely slowly after liftoff and that, although the landing gear retracted, the flaps remained fully extended. At an altitude of about 200 to 300 ft agl, the airplane pitched up, and the witness observed the left wing drop before the airplane entered a nose-down descent. The video study showed that the airplane flew approximately straight until about 4.7 seconds before impact, when it began a left turn, and that it impacted terrain in an approximately 90° left-wing-down attitude. The observed pitch increase, left-wing drop, and subsequent nose-low descent were consistent with the airplane exceeding its critical angle of attack and entering an aerodynamic stall at an altitude insufficient for recovery.

Probable Cause and Findings

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

The pilot's exceedance of the airplane's critical angle of attack during the initial climb, which resulted in an aerodynamic stall at an altitude insufficient for recovery. Contributing to the accident was the pilot's failure to ensure that the airplane was properly configured for takeoff.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Use of equip/system - Pilot
Aircraft	(general) - Not attained/maintained
Aircraft	Angle of attack - Capability exceeded
Aircraft	TE flap actuator - Incorrect use/operation

Factual Information

History of Flight

Initial climb	Aerodynamic stall/spin (Defining event)

On June 15, 2024, about 1236 Pacific daylight time, a Lockheed 12A airplane, N93R, was substantially damaged when it was involved in an accident near Chino, California. The pilot and co-pilot were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The operator reported that the museum was hosting a Father's Day event that included a three-airplane formation flight later on during the day. The accident flight was conducted in preparation for the planned formation flight. During a morning briefing, the operator assigned a pilot and co-pilot to each airplane.

According to the operator's representative, he believed that the co-pilot lowered the flaps as part of a functional test during the preflight inspection. During engine start, the ground crew warned the flight crew using hand and arm signals that the flaps were extended; however, the flight crew did not acknowledge the warning. Based on his experience with and observations of the accident airplane, the operator's representative believe that the flaps were fully extended during the taxi and takeoff roll.

The operator's representative reported that flight crews commonly reduced engine rpm during takeoff to keep the engine oil temperatures lower on hot days and reduce propeller and engine noise.

Witnesses at the airport observed the accident airplane taxi to the runway and take off with the flaps extended. One witness reported that the airplane departed the runway with the flaps fully extended and appeared to be moving extremely slowly. He observed the landing gear retract after liftoff while the flaps remained fully extended. Video footage of the accident flight also captured the flaps extended during the initial climb (see figure). A witness observed the airplane pitch up about 200 to 300 ft agl and the left wing dropped before the airplane entered a nose-low descent. The airplane subsequently impacted terrain, and a postcrash fire ensued.

Figure. Screen capture of witness-provided video of the accident airplane with the flaps extended during the takeoff climb.

Video footage obtained from onboard the accident airplane and from a witness on the ground was sent to the National Transportation Safety Board Recorders Laboratory, Washington, DC, for a video study. The witness-provided video showed that both engines were operating until ground impact. The study estimated that the engine speeds ranged from 1,978 rpm to 2,098 rpm, which is below the 2,200- to 2,300-rpm takeoff speed for the engines. The video study also showed that the airplane flew approximately straight until about 4.7 seconds before impact, when it began a left turn, and that it impacted terrain in an approximately 90° left-wing-down attitude.

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer; Flight instructor; Private	**Age:**	71,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Balloon; Glider; Helicopter	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Waiver time limited special	**Last FAA Medical Exam:**	December 1, 2023
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	June 3, 2022
Flight Time:	(Estimated) 16400 hours (Total, all aircraft)		

Pilot Information

Certificate:	Private	**Age:**	67,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Waiver time limited special	**Last FAA Medical Exam:**	June 1, 2023
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 2, 2022
Flight Time:	(Estimated) 512 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Lockheed	**Registration:**	N93R
Model/Series:	12A	**Aircraft Category:**	Airplane
Year of Manufacture:	1939	**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	1257
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	8
Date/Type of Last Inspection:	March 1, 2024 Annual	**Certified Max Gross Wt.:**	8400 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	6321 Hrs as of last inspection	**Engine Manufacturer:**	P&W
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	R985-14B
Registered Owner:	VINTAGE AERO AVIATION LLC	**Rated Power:**	450 Horsepower
Operator:	Yanks Air Museum	**Operating Certificate(s) Held:**	None

The airplane was equipped with electrically operated wing flaps. The flight manual stated that the flaps require about 22 seconds to extend and about 12 seconds to retract. The flight manual's before-takeoff procedure specified that the flaps should be up with the flap control in the Up position. According to the airplane flight manual, "…the flaps should not be retracted when the ship is near the stalling point, as retraction under those conditions stalls the ship."

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCNO,636 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	12:40 Local	**Direction from Accident Site:**	82°
Lowest Cloud Condition:	Clear	**Visibility**	8 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / 15 knots	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.81 inches Hg	**Temperature/Dew Point:**	33°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Chino, CA	**Type of Flight Plan Filed:**	None
Destination:	Chino, CA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class D

Airport Information

Airport:	CHINO CNO	**Runway Surface Type:**	Asphalt
Airport Elevation:	650 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	26R	**IFR Approach:**	None
Runway Length/Width:	4858 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	Unknown
Total Injuries:	2 Fatal	**Latitude, Longitude:**	33.975375,-117.64796(est)

Examination of the accident site revealed that the airplane impacted terrain about 170 ft southwest of the departure end of runway 26R. The first identified point of contact (FIPC) with terrain was a ground scar/impression that was about 29 ft long, 18 inches wide and 8 inches deep. The debris path was oriented on a heading of about 203° magnetic and was extended about 220 ft from the FIPC. An additional ground scar was observed about 45 ft from the FIPC within the debris path and contained two shattered glass panes consistent in size with the

center windscreens. Various portions of aluminum wing skin, the left wing, and the aileron were observed throughout the debris path. The fuselage came to rest upright on a heading of about 318° magnetic at an elevation of 619 ft mean sea level. The right wing remained attached to the fuselage at the wing root. The right wing flap was extended. The left wing was fragmented and mostly consumed by the postcrash fire.

Flight control continuity was established from the cockpit controls to all of the flight control surfaces; separations in the flight control cables were consistent with damage sustained during the accident sequence. During postaccident testing, the flap motor operated in both directions with no anomalies noted.

Postaccident examination of the airplane revealed no evidence of preaccident mechanical malfunctions or failures that would have precluded normal operation.

Medical and Pathological Information

Autopsies of the pilot and co-pilot were performed by the San Bernardino County Sheriff's Department Coroner. According to the pilot's autopsy report, the cause of death was multiple blunt force injuries, and the manner of death was accident. The pilot's autopsy identified 50% narrowing of the left anterior descending, left circumflex, and right coronary arteries by plaque. The pilot's heart weight was elevated and a medical device consistent with a pacemaker was present. The autopsy also identified moderate plaque in the aorta and the arteries at the base of the brain.

Toxicology testing performed at the FAA Forensic Sciences Laboratory found bisoprolol in the pilot's blood and urine. Bisoprolol (Zebeta) is a beta-blocker used to treat hypertension and heart failure.

Bisoprolol is a prescription medication that can be used in the treatment of certain heart conditions, including for rate control in atrial fibrillation, for suppression of ventricular arrhythmias, and to help treat some kinds of chest pain, heart failure, and high blood pressure. Bisoprolol is not typically impairing and was among the medications the pilot reported at his last aviation medical examination.

Alprazolam, hydroxyalprazolam, atorvastatin, amlodipine and ibuprofen were found in the co-pilot's specimens. Alprazolam (Xanax) is a benzodiazepine used to treat anxiety and can cause unsteadiness, difficulty with coordination, drowsiness, and trouble concentrating.

Atorvastatin (Lipitor) is an HMG CoA Reductase inhibitor (statin) used to treat high cholesterol. Amlodipine (Norvasc) is a calcium channel blocker used to treat high blood pressure and coronary artery disease. Ibuprofen (Motrin) is a non-prescription NSAID used to treat pain, fever, and inflammation.

According to the co-pilot's autopsy report, the cause of death was blunt force injuries, and the manner of death was accident.

Additional Information

The FAA *Pilot's Handbook of Aeronautical Knowledge*, states that a stall is a rapid decrease in lift caused by the separation of airflow from the wing's surface, brought on by exceeding the critical angle of attack. A stall can occur at any pitch attitude or airspeed.

Administrative Information

Investigator In Charge (IIC):	Gutierrez, Eric
Additional Participating Persons:	Christina Wall; Federal Aviation Administration; Riverside, CA
Original Publish Date:	August 26, 2026
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=194475

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.