



# Aviation Investigation Final Report

<b>Location:</b>	Hampton, Virginia	<b>Accident Number:</b>	ERA25FA185
<b>Date &amp; Time:</b>	April 24, 2025, 11:35 Local	<b>Registration:</b>	N530RH
<b>Aircraft:</b>	MX AIRCRAFT TECH PTY LTD MXS	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Flight control sys malf/fail	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot of the aerobatic airplane was on approach to a runway at the destination airport at the conclusion of a cross-country flight. According to a witness, and electronic data recovered from avionics onboard the airplane, the airplane leveled off about 50 ft above the runway and flew straight down the runway for several hundred feet. The airplane then pitched up and then down before it pitched up to a nose high pitch attitude and climbed several hundred feet. The airplane then rolled 90° to the left, pulled over the top of a loop, and descended before impacting the ground.

Postaccident examination of the airplane at the accident site revealed that that a counterweight plug that normally would have been installed in the left elevator was not present and was found on the ground about 10 ft behind the wreckage. The counterweight plug for the right elevator was found installed and tight. The left elevator counterweight plug threads were intact, about half of the circumference of the counterweight plug displayed gouging, and an area showed evidence of paint transfer. The horizontal stabilizer structure adjacent to the left elevator position where the counterweight plug would have been installed displayed dents and paint scrapes consistent with contact with the counterweight plug. A washer beneath a screw secured to the horizontal stabilizer structure (near where the paint scrapes were observed) was also dented. Metallurgical examination revealed that both the washer and screw had thickness profiles that matched the marks in the outer diameter edge on the counterweight plug and that the marks were consistent with the washer having made repeated contact with plug.

The elevator counterweight plugs were part of a custom feature that the pilot requested the airframe manufacturer incorporate into the elevator during its construction. The airframe manufacturer described the plugs as a short-term solution and they did not provide any

instructions for continuing airworthiness, to include torque values to be used when installing the plugs. The manufacturer also stated the plug design incorporated an o-ring that would serve as a secondary locking mechanism. No o-ring was found on the recovered plug at the accident site, nor was one found on the still-installed right elevator's counterweight plug. Additionally, the plugs found installed on the accident airplane differed dimensionally from those specified in a design document provided by the airframe manufacturer.

Based on the available information, it is likely that the left elevator counterweight plug loosened during the flight until it made contact with the washer and screw in the horizontal stabilizer, sufficient to jam the elevator. This ultimately resulted in the pilot being unable control the airplane during the landing, and the subsequent impact with terrain.

## Probable Cause and Findings

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

A counterweight plug that loosened during the accident flight, jammed the elevator, and resulted in loss of control during landing.

### Findings

<b>Aircraft</b>	Elevator control system - Malfunction
<b>Aircraft</b>	Fasteners - Not specified

## Factual Information

### History of Flight

<b>Landing</b>	Flight control sys malf/fail (Defining event)
<b>Landing</b>	Loss of control in flight
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

On April 24, 2025, about 1135 eastern daylight time, an MX Aircraft Tech PTY LTD MXS airplane, N530RH, was substantially damaged when it was involved in an accident at Langley Air Force Base (LFI), Hampton, Virginia. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The flight originated from Smyrna Airport (MQY), Smyrna, Tennessee, and was destined for LFI, where the pilot intended to perform an aerobatic routine during an upcoming air show. Two witnesses stated that they observed the airplane on approach to land on runway 08 at LFI. According to one witness, the airplane made a smooth approach to the runway, then leveled off about 50 ft above the runway and flew straight down the runway for several hundred feet. The airplane then “porpoised” twice, during which it pitched up then quickly pitched down to its original altitude. The airplane then pitched up to about “45° to 60° pitch,” climbed to several hundred feet, rolled 90° to the left, pulled over the top of a loop, and descended straight toward the ground. A second witness reported that it looked like the airplane was going to pull up, but it continued “nosediving” to the ground.

An electronic flight instrument system was recovered from the accident airplane and its data were successfully recovered after the accident. The data revealed that the airplane made a stable approach to the runway, leveled off, and flew straight down the runway. The airplane then pitched up and quickly down twice before the data ended. The data were consistent with the witness descriptions of the accident sequence.

## Pilot Information

<b>Certificate:</b>	Airline transport	<b>Age:</b>	50, Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea; Multi-engine land	<b>Seat Occupied:</b>	Single
<b>Other Aircraft Rating(s):</b>	Glider	<b>Restraint Used:</b>	5-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	March 5, 2025
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	15387 hours (Total, all aircraft)		

The pilot held an airline transport pilot certificate with ratings for airplane single-engine land, airplane single-engine sea, airplane multiengine land, and gliders. He also held flight instructor and ground instructor certificates. The pilot reported 15,387 total hours of flight experience on his most recent application for an FAA second-class medical certificate, which was issued on March 5, 2025.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	MX AIRCRAFT TECH PTY LTD	<b>Registration:</b>	N530RH
<b>Model/Series:</b>	MXS	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2019	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	MXS-001
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	1
<b>Date/Type of Last Inspection:</b>	March 3, 2025 Annual	<b>Certified Max Gross Wt.:</b>	1600 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	1062 Hrs as of last inspection	<b>Engine Manufacturer:</b>	LYCOMING
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	AEIO-540 SER
<b>Registered Owner:</b>	ROB HOLLAND ULTIMATE AIRSHOWS LLC	<b>Rated Power:</b>	260 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The single-seat aerobatic airplane, serial number MXS-001, was issued a special airworthiness certificate in the experimental category for the purpose of exhibition and air racing on July 26, 2019.

A representative of the airframe manufacturer stated that the pilot had previously contacted them and requested that they incorporate an adjustable balance tube into the design of the elevator during its construction. The design included an access hole in the left and right elevator horns to insert counterweights. The access hole/tube was covered by a plug (see figure 1). The manufacturer described that the plugs were designed as a short-term solution and that no manuals or other information was provided specifying torque valves to be used when installing the plug. The airframe manufacturer also provided a design drawing for the plug that appeared to be dimensionally different from the plug found installed in the accident airplane. The design document also called for an o-ring, which the airframe manufacturer described as a locking device. No o-rings were found on either of the plugs associated with the accident airplane. When asked about the differences observed between the specified plug and the plugs found on the accident airplane, the airframe manufacturer could not explain the discrepancy.



Figure 1. Counterweight plug as installed on the right elevator (postaccident photograph).

The airplane's most recent annual inspection was completed on March 3, 2025, at a total airframe time of 1,062 hours.

Following the accident, the airframe manufacturer published an undated Mandatory Safety Notice (SN 2025-01), which was applicable to MXS and MX2 airplanes fitted with adjustable balance tubes, and provided instructions for filling existing adjustable balance tubes with a lead/resin mixture.

### Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	LFI,10 ft msl	<b>Distance from Accident Site:</b>	1 Nautical Miles
<b>Observation Time:</b>	11:36 Local	<b>Direction from Accident Site:</b>	70°
<b>Lowest Cloud Condition:</b>	Scattered / 25000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/ None	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.31 inches Hg	<b>Temperature/Dew Point:</b>	20°C / 5°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Smyrna, TN (MQY)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Hampton, VA	<b>Type of Clearance:</b>	Unknown
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Military operation area

### Airport Information

<b>Airport:</b>	LANGLEY AFB LFI	<b>Runway Surface Type:</b>	Concrete
<b>Airport Elevation:</b>	8 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	08	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	10002 ft / 150 ft	<b>VFR Approach/Landing:</b>	Full stop

### Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	37.078799,-76.374451

The wreckage of the airplane came to rest oriented on a heading of 150° in a ditch about 100 ft from the left side of runway 08 and 500 ft beyond the approach threshold. All major components of the airplane were accounted for at the accident site. The left elevator counterweight plug was located about 10 ft behind the wreckage in the grass.

Postaccident examination revealed that dirt consistent with that found in the vicinity of the accident site was identified on the elevator, as well as in the counterbore and threaded area where the left elevator counterweight plug would have been installed. The counterweight plug threads were intact and also contained similar dirt contamination consistent with that found on the elevator. About half the circumference of the left elevator counterweight plug displayed gouging, and an area showed evidence of paint transfer (see figure 2). No o-ring associated with the left elevator plug was found. The right elevator counterweight plug remained installed and was tight. It was removed and found to contain no o-ring.

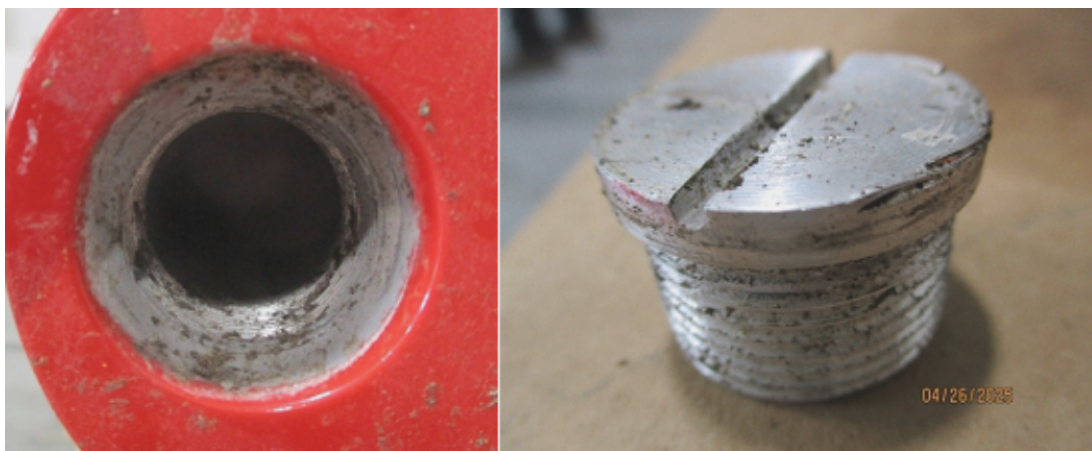


Figure 2. Left elevator counterweight installation hole (left) and recovered counterweight plug (right). Gouging and paint transfer are visible on the counterweight plug.

The horizontal stabilizer structure adjacent to the elevator position where the counterweight plug would have been installed displayed dents and paint scrapes that appeared visually consistent with contact with the counterweight plug. A washer beneath a stainless steel screw secured to the horizontal stabilizer structure (near where the paint scrapes were observed) was also dented (see figure 3).

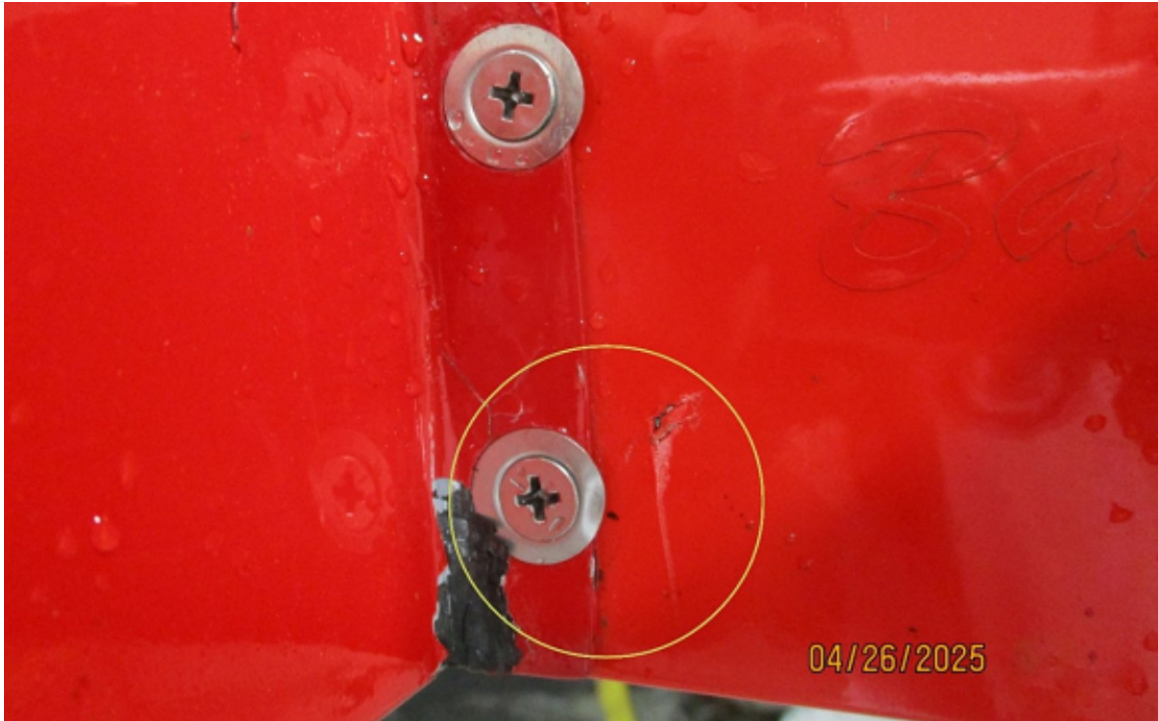


Figure 3. Horizontal stabilizer structure adjacent to the left elevator counterweight plug, showing paint scrapes and a dented washer (circled in yellow).

The counterweight plug, washer, and screw were sent to the NTSB Materials Laboratory for further examination. Metallurgical examination revealed that both the washer and screw had thickness profiles that matched the marks in the outer diameter edge on the aluminum plug and that the marks were consistent with the washer having made repeated contact with the aluminum plug (see figure 4).



Figure 4. Impression marks on the counterweight plug consistent with contact with the washer (left) and screw (right).

Examination of the remainder of the airplane revealed that the left wing remained attached to the fuselage. The left aileron was intact, but the outer section of the aileron was fractured at its hinge point. The right wing remained attached to the fuselage. The center fuel tank was breached, and both the left and right fuel tanks were empty.

The empennage was intact, and the left elevator was fractured off the outer hinge at the upper bracket that connected to the fuselage. The elevator trim tab was found in the full up (nose down) position. The right elevator was intact and remained attached. The rudder was intact, and the bottom of the rudder was crushed. The cockpit and instrument panel displayed impact-related damage, and several instruments were dislodged and located around the cockpit. The throttle grip was fractured off the side of the cockpit. The control column was fractured off the bottom hinge point. The canopy was fractured into several pieces that were located around the main wreckage. Flight control continuity was traced from the cockpit control stick to all flight control surfaces. The right aileron torque tube was fractured consistent with impact.

The propeller hub remained attached to the engine crankshaft. Two of the three propeller blades were broken off at the hub. The remaining propeller blade exhibited minor scoring. The rear part of the oil sump/air plenum was fractured. The exhaust and intake tubes were crushed upward. The top two engine mounts were separated from the engine case. The top spark plugs were removed and appeared normal as compared to the Champion Aviation chart AV-27. When the engine crankshaft was rotated by hand, thumb compression was attained at all the cylinders, and engine drivetrain continuity was confirmed throughout.

## **Medical and Pathological Information**

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The Defense Health Agency, Armed Forces Medical Examiner's office performed an autopsy and toxicological testing of the pilot's remains. The cause of death was multiple blunt force injuries. The toxicology was negative for all tested-for drugs.

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Boggs, Daniel
<b>Additional Participating Persons:</b>	Daniel McSherry; FAA/FSDO; Norfolk, VA Troy Helgeson; Lycoming Engines; Denver, CO Rudy Corcoran; Australian Transport Safety Bureau; Canberra
<b>Original Publish Date:</b>	July 2, 2026
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=200061">https://data.ntsb.gov/Docket?ProjectID=200061</a>

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](#).