



NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety

Wreckage Examination Group Field Notes

May 7, 2022

A. ACCIDENT WPR22FA172

Location: Sausalito, California
Date: May 6, 2022
Time: 1210 PDT
Operator: Private
Aircraft: Vans RV-10 Experimental Airplane
Registration: N54MG

B. PARTICIPANTS or GROUP NAME:

Stephen Stein National Transportation Safety Board Federal Way, Washington
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C. SUMMARY

On May 6, 2022, about 1210 Pacific daylight time, a Vans RV-10 experimental amateur built airplane, N54MG, was substantially damaged when it was involved in an accident near Sausalito, California. The private pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to track data obtained from a commercially available third-party source, the airplane departed Sacramento Executive Airport, Sacramento, California about 1129 and transitioned into a climb on a southwest heading. The airplane leveled off about 5,500 ft mean sea level (msl) approximately 6 minutes later. The airplane turned south about 12 minutes later and subsequently entered a descent as it flew along San Pablo Bay towards San Francisco Bay.

Preliminary air traffic control (ATC) audio from the Federal Aviation Administration revealed that the pilot made radio contact with air traffic control at 1152 and requested a “Bay Tour” while enroute to his destination of Half Moon Bay, California. The controller instructed the pilot to remain northwest of the Bay Bridge and to remain clear of Class B airspace. He then advised the pilot to notify him when the pilot had obtained local weather for his destination airport. The airplane descended to about 1,300 ft msl after it had reached San Francisco Bay and then began a climb a few seconds later. At 1157, the controller briefed a new controller on the intentions of the accident airplane.

At 1158 the airplane started a 360° turn to the right around Alcatraz Island and then resumed a southerly heading for about 1 minute before making a left turn to the north passing Treasure Island. At 1202 the airplane turned southwest after it climbed to about 2,400 ft msl and then began a descent. The airplane approached the north tower of the Golden Gate Bridge about 1205 at which time the pilot contacted ATC to request the transition route to his destination airport and the controller instructed him to remain outside of Class B airspace. The pilot then made another request for the transition route and the controller issued the same instructions. During the next 5 minutes, the airplane made a series of turns at different altitudes near the north end of the Golden Gate Bridge. The track ceased at 1209:41, about 1,700 ft south of the accident site.



Figure 1: Route of flight from Sacramento to San Francisco Bay

The airplane wreckage was discovered by United States Park Rangers at 1403.

Two witnesses were located about 0.6 nm east of the accident site around the time of the accident. They both reported that visibility was low and the fog layer was thick; one witness stated that she could not see the top of the north tower of the Golden Gate Bridge. According to the Golden Gate Bridge Highway and Transportation District, the Golden Gate Bridge towers extend 746 ft above the water. The north tower of the Golden Gate Bridge was located about 0.8 nm southeast of the accident site.

The airplane came to rest in an approximately 40° nose down attitude on a heading of about 111° magnetic, and was located on the southwest side of a hill in the Marin Headlands at a field elevation of about 800 ft msl. All four corners of the airplane were accounted for at the accident site. The first point of impact (FPI) was marked by a divot about 15 ft southwest of the main wreckage. A debris path comprised of engine cowlings, was traced from the FPI to the main wreckage on a magnetic heading of 340°.



Photograph 1: Accident site from the southwest

D. DETAILS OF THE INVESTIGATION

D.1 Onscene Examination

D.1.1 Wings

The left wing was attached to the fuselage and the aileron and flap were both attached to the wing at their hinge points. Leading edge crush damage was observed throughout the wing with hydraulic deformation along the inboard leading edge of the left wing fuel tank. The wing skin had separated at the left wingtip.



Photograph 2: View of left wing at accident site

The right wing separated at the wing root and was displaced slightly aft of its normal position relative to the fuselage. The flap remained attached to the wing at all three of its hinge points. The left aileron had separated from the inboard push pull tube and outboard hinge and was located about 15 ft north of the main wreckage. Leading edge deformation and bending was observed from midspan to the outboard wing, which was bent upward. Compression wrinkles with some deformation was observed along the leading edge from the midspan right wing inboard to the wing root.



Photograph 3: View of right wing at accident site

D.1.4 Fuselage

The fuselage was mostly intact. Compression wrinkles were observed at the top of the fuselage near the aft bulkhead. Both the windshield and right door plexiglass were broken and the fragments were collocated with the main wreckage. The left (pilot side) window post was separated near the lower fuselage. Both doors remained attached to the fuselage at their hinge points. The firewall was pushed forward into the engine compartment and the lower fuselage was crushed at the foot wells.

The emergency locator transmitter was manufactured by ACK and was a model E-04. The data plate indicated that the unit satisfied Federal Aviation Administration Technical Standing Order 126b.



Photograph 4: View of left side fuselage

D.1.4.1 Seats

Both the pilot and co-pilot seats were equipped with 4 point harnesses and remained attached to their seat rails. The pilot seat harness remained attached to the fuselage at each of its attachment points and the rotary buckle functioned normally when tested with each buckle. Most of the co-pilot seat harness straps were intact, with the exception of the right lap belt which was cut by recovery personnel. The co-pilot seat rotary buckle also functioned normally when tested with each buckle. None of the harness straps for either occupant displayed any fretting or wear.

D.1.3 Empennage

The empennage remained attached to the fuselage along with the rudder, elevator, and elevator trim, which were all attached to the empennage at their mounts. Compression wrinkles were observed at the top of the rudder and near the aft fuselage.

D.1.4 Flight Controls

Flight control continuity was confirmed from the cockpit to the left aileron and traced from the cockpit to the right aileron push/pull tube through two separations at the wing root. The first separation was a fractured rod end at the aileron torque tube bellcrank. Additionally, each of the push tube rivets had sheared at the bell crank assembly. The electric flap system was not tested due to safety concerns.



Photograph 5: Right wing torque tube at inboard wing



Photograph 6: Fractured rod end and push tube, inboard right aileron

Continuity of the elevator and rudder control was confirmed from the rudder control cables and elevator push tube at the aft bulkhead to their respective control surfaces. The rudder and elevator controls at the cockpit were seized. The electric trim system was not tested due to safety concerns.

D.1.5 Cockpit/Cabin

The throttle, mixture, and propeller cockpit controls were in the full forward positions. Continuity of the throttle control was confirmed from the control to a separation at the throttle arm. The mixture control was seized. Continuity of the propeller control was confirmed from the control to the propeller governor, which moved from stop to stop as the control was actuated by hand. The fuel selector was in the LEFT tank position.

D.1.6 Engine

The airplane was equipped with a Lycoming Engines YIO-540-D4A5, a 250 hp, horizontally opposed, air cooled, reciprocating engine. The engine was attached to the firewall at the upper mounts and right lower mount. The left lower mount was fractured. The right and left electronic ignition cases were separated from the engine accessory case and some of the ignition harness leads had separated from the cases. The oil filter and alternator had also separated from the engine accessory case. Each of the 6 NGK top spark plugs were secured at their plug portals and their corresponding ignition harness leads were secure. The engine showed 4 quarts of oil in the oil sump, which could not be inspected as the bottom of the engine was flush with the ground and

could not be lifted by hand. Approximately 1 oz. of fuel was drained from the fuel transducer line, which was blue in color with some dirt sediment.

The 2 bladed constant speed propeller remained attached to the engine at the crankshaft. One propeller blade was straight and did not exhibit any nicks, gouges or chordwise scratches. The other blade was bent about midspan with nicks and gouges near the blade tip and chordwise scratches at the blade face.



Photograph 7: Right side engine and propeller