

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23FA247

ONSCENE AND WRECKAGE EXAMINATION REPORT

July 5, 2023

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. PARTICIPANTS.....	3
C. SUMMARY	3
D. DETAILS OF INVESTIGATION.....	4
1.0 ACCIDENT SITE	4
2.0 AIRFRAME EXAMINATION.....	5
2.1 Fuselage.....	5
2.2 Empennage	5
2.3 Wings.....	5
2.4 Landing Gear.....	6
2.5 Survivability.....	6
2.6 Fuel/Fuel System.....	6
2.7 Flight Control System.....	7
3.0 ENGINE EXAMINATION	7
4.0 PROPELLER EXAMINATION	8
5.0 PILOT INFORMATION	8

A. ACCIDENT

Location: Murrieta, California
Date: July 4, 2023
Time: 1357 Pacific Daylight Time
Airplane: Cessna 172N, Registration N5243E

B. PARTICIPANTS

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Party Coordinator	Christina Wall Federal Aviation Administration Riverside, California
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C. SUMMARY

On July 4, 2023, about 1357 Pacific daylight time, a Cessna 172N, N5243E, was substantially damaged when it was involved in an accident near Murrieta, California. The pilot was fatally injured and the three passengers were seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Surveillance video showed the airplane approach runway 18 for landing. The airplane touched down once and then immediately entered a climb in a nose high attitude as it drifted left of the runway centerline. After the airplane reached about 60 ft above ground level it began to settle and subsequently entered a left wing low attitude. The airplane rolled inverted and then disappeared from view behind a building.

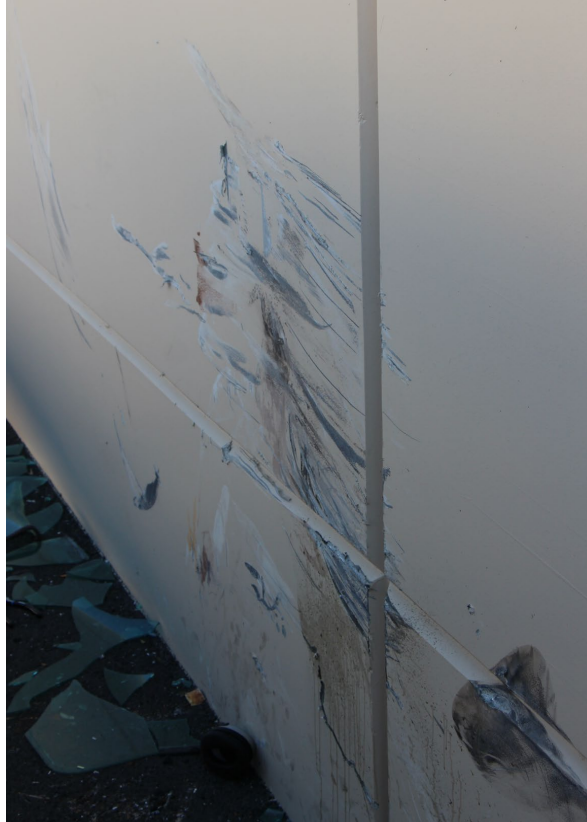


Photograph 1: Airplane at accident site

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site

The airplane came to rest inverted in an industrial complex approximately 0.3 nm from approach end of runway 18 on an orientation of 125° magnetic. All major structures were accounted for at the accident site. The airplane was adjacent to an approximately 50 foot tall building, which displayed a diagonal transfer mark that extended nearly the vertical length of the building. A dark black transfer mark was observed on the same wall about 5 ft from the ground and multiple horizontally oriented striations were below the black mark. An additional black transfer mark was located a few inches from the striations.



Photograph 2: Striations on adjacent building

2.0 Airframe Examination

2.1 Fuselage

The fuselage was intact. Compression wrinkles were on the bottom of the fuselage. The forward fuselage was displaced downward relative to the airplane's inverted position. Both the lower and upper cowlings were separated.

2.2 Empennage

The empennage was intact and comprised of both horizontal stabilizers, elevators, the vertical stabilizer and the rudder. The elevator trim tab remained attached to the right elevator and exhibited an upward deflection. The rudder cap was crushed and the top of the vertical stabilizer was damaged.

2.3 Wings

The left aileron and flap were attached to the left wing, which remained attached to the fuselage. A large bend was observed in the flap about 24 inches outboard of the wing root. Several inches of bottom skin were buckled and torn at the inboard wing. The leading edge was crushed about 31 inches outboard of the wing root. The wingtip cap was crushed and the tip was deformed.

ONSCENE AND WRECKAGE EXAMINATION REPORT

The right wing was separated from the fuselage at the forward attachment and the wing was displaced aft 37°. Both the right aileron and flap were attached to the wing at each of their respective attachment points. The flap was bent about midspan. A portion of the lower skin was buckled at the wing root and an inboard portion of the top skin was sheared at its rivets. The outboard leading edge exhibited accordion style compression and the inboard leading edge displayed evidence of bulging.

2.4 Landing Gear

All three of the tricycle configured landing gear remained attached to the airplane. The nose landing gear exhibited a grey paint transfer mark and the right main landing gear was displaced.

2.5 Survivability

The airplane was equipped with individual seats for the pilot and front seat passenger that were attached to seat rails. The pilot side seat legs were cut by first responders and the seat rollers were normal in appearance and the tangs were intact. A secondary seat stop remained attached to the bottom of the pilot side seat. The secondary seat stop belt was still attached to the floor, but the belt had been cut by first responders. The front passenger seat was removed from the seat rails by first responders and the tangs were partially splayed. The rear seat row was attached at three of four of its cabin floor mounts. The aft right side gear leg was fractured.

The front seats (pilot and co-pilot) were both equipped with three-point restraints and the two rear seats were equipped with lap belts. Both front seat occupants' lap restraints were cut by recovery personnel. The three-point restraints were attached to the fuselage at their respective attachment points and the pilot side seat buckle was in the latched position. The front right passenger seat restraint was unlatched. The rear seat right passenger buckle was unlatched and the rear seat left passenger buckle was latched. The belts to the rear right passenger's seat restraint were affixed to the floor and the belt with the clasp attachment to the rear left passenger's seat was also attached to the floor. The belt with the latch attachment to the rear left passenger's seat had separated from the floor. The latch attachment bolt was missing from the floor and the attachment bolt hole was unremarkable.

All the latches functioned normally when tested.

2.6 Fuel/Fuel System

Both fuel tanks were ruptured and evidence of fuel staining was present on each wing. The staining was blue consistent with 100 low lead aviation grade gasoline. Fuel staining was also observed around the fuel strainer, which remained attached in its fixed position at the engine firewall. The fuel strainer bowl was void of fuel and free of any contamination. The fuel strainer filter was also free of debris.

When air was blown through the fuel inlet port at each wing root it was expelled through the outlet port at the fuel strainer as the fuel selector was rotated from the right, left, and both positions. The fuel selector was cycled through each detent at each of these positions.

2.7 Flight Control System

Continuity of the left and right ailerons was traced from the flight control surface to the cockpit flight controls through a separation at the wing root that was made by recovery personnel. The elevator and rudder control cables were traced from the elevator to the flight controls. The elevator trim cables were continuous from the trim wheel in the cockpit to the elevator trim tab. The trim tab exhibited a 15° tab up deflection. Flap cable interconnect was continuous from the right wing bellcrank to the left wing bellcrank. The flap lever was in the up position and the flap indicator displayed 20°. The flap actuator jackscrew threads were not exposed consistent with no flap deployment.

3.0 Engine Examination

The engine remained partially attached to the engine firewall at the two left side engine mounts. The propeller separated from the crankshaft at the flange, which was partially bent aft. Cooling fins for cylinders 1 and 2 were damaged and the intake push tube to cylinder 2 was crushed. Each of the intake and exhaust tubes remained attached at each cylinder. The starter exhibited a score mark at the one o'clock position, consistent with contact from the starter ring gear.

The crankshaft was rotated at the vacuum pump drive using a hand tool; however, crankshaft rotation was limited to about 350°. The combustion chamber of each cylinder was examined through the spark plug holes utilizing a lighted borescope. The combustion chambers remained mechanically undamaged and there was no evidence of foreign object ingestion or detonation. Full rotation was achieved after cylinder 2 was removed and normal valve lift was observed for cylinders 1, 3 and 4. Cylinders 3 and 4 exhibited normal compression and cylinder 1 compression was low. Combustion deposits were observed within the cylinder dome of cylinder 1.

The single-drive dual magneto remained attached to the engine at its mounting pad. The right side of the magneto case was fractured and the right side capacitor was exposed. Each ignition coil remained securely attached at its respective spark plug and the coils were unremarkable. Spark was observed on all four leads of each magneto as the magneto drive was rotated with a power tool at the drive end of the magneto.

The top and bottom spark plugs were manufactured by Tempest, and were all model URHM 38E massive electrode plugs. The top plugs to cylinders 1, 3, and 4 and the bottom plugs to cylinders 2, 3, and 4 displayed coloration consistent with normal appearance when compared to the Champion Check-A-Plug chart (AV-27). Cylinder 1 bottom plug was also normal in appearance with some combustion debris. The condition of the cylinder 2 top spark plug was unknown as the plug was fractured and the electrode end was not identified within the wreckage.

Cylinders 3 and 4 were examined using a lighted borescope and cylinders 1 and 2 were examined through visual inspection. The valves were intact and undamaged and no evidence of valve to piston face contact was observed. The gas path and combustion signatures observed at the spark plugs, combustion chambers and exhaust system components displayed coloration consistent with normal operation. The exhaust system and muffler were found free of obstructions.

Clean, uncontaminated oil was observed at all four rocker box covers. The oil suction screen was free of debris and the oil filter was crushed, but remained attached to the oil filter adapter. The oil filter element was not inspected.

The carburetor remained attached to the plenum of its mounting pad at the bottom of the engine. The carburetor bowl was void of fuel and free of contaminants. Both carburetor floats were intact and attached to the float arms. The needle was also intact and unremarkable. The carburetor filter was free of debris.

The vacuum pump rotor and vanes were intact.

4.0 Propeller Examination

The two-bladed fixed pitch propeller was separated from the crankshaft at the propeller flange. Both blades exhibited nicks, leading edge gouges, and chordwise striations. One blade displayed S bending and the other blade was partially twisted.

5.0 Pilot Information

The pilot received his private pilot certificate with rating for single-engine land on June 19, 2023. According to the pilot's logbook he had amassed a total of 65.3 flight hours at the time of the accident, 64.3 of which were in the accident airplane make and model.

Submitted by:

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