



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

October 1 & 2, 2021

ACCIDENT SITE EXAMINATION SUMMARY

WPR22FA001

This document contains 16 embedded photos.

A. ACCIDENT

Location: Chandler, Arizona
Date: October 1, 2021
Aircraft: Piper, PA-28-181, N2868H /
Robinson Helicopter Company, R22, N412TL
NTSB Investigator-in-Charge: Eric M. Gutierrez

B. DETAILS OF THE INVESTIGATION

1.0 Airplane Accident Site Examination

GPS Location: 33.26951, -111.80949

Examination of the airplane accident site revealed that, the airplane landed on runway 04R, veered left and exited the left side of the runway. The airplane came to rest on the dirt field between runway 04R and 04L, on a heading of about 345° magnetic, at an elevation of 1,224 ft mean sea level (msl).



Figure 1: View of accident site diagram

The first identified point of contact (FIPC) with the runway was a ground scar/impression that started about 1,200 ft beyond the landing threshold of runway 04R. The ground scar/impression was about 730 ft long and 4 inches wide and terminated at the airplane.



Figure 2: View of initial impact ground scar



Figure 3: View of airplane main wreckage

2.0 Airplane Airframe Examination

Flight control continuity was established from all primary flight control surfaces to the cockpit controls. No separations in the control cables were observed.

Throttle control and fuel mixture continuity was established from the cockpit control to the carburetor. The throttle and mixture control moved freely, from stop to stop.

The anti-collision, rotating beacon, navigation and strobe lights were functionally tested, and no anomalies were noted.

Instrument Panel and Cockpit Documentation:

- Throttle: aft / idle
- Mixture Lever: aft
- Fuel Selector Lever: off
- Fuel Gauges: 0
- Oil Pressure: 0
- Oil Temp: 0
- Turn/Bank: level / ball to the left
- Altimeter: 1220 / kollsman: 30.00
- Vertical Speed Indicator: 0
- Airspeed: 0
- Attitude Indicator: about a 10° to the left
- Heading Indicator: 325
- Ignition Switch: Off
- Panel Lights: Off
- Flaps: Extended to 40°
- Circuit breakers: all were in, except the pitch/trim. The pitch/trim circuit breaker was zip-tied (collared) in the open position.



Figure 4: View of airplane instrument panel

The nose landing wheel and tire separated from the nose gear assembly and were located near the helicopter accident site. The nose landing gear fork casting had fractured near the upper

attachment point; the left-side and right-side forks separated from the casting and were located near the runway edge, about 10 ft behind the main wreckage.



Figure 5: View of airplane nose landing gear wheel and tire

The left wing remained attached to the fuselage. The left flap and aileron remained attached via their respective mounts. The fuel tank fuel cap was observed in place and secure. The flap was observed in the “down” position. Damage was observed to the left flap trailing edge throughout the entire span of the flap.



Figure 6: View of airplane left wing

The left main landing gear was separated from the airplane at the wing spar attachment and located near the helicopter accident site. The landing gear strut fairing exhibited impact damage near the bottom section. The tire was cut, about 9 inches in length on the tread.



Figure 7: View of airplane left landing gear

The airplane fuselage was mostly intact; the undercarriage revealed crushing and jagged tearing measuring about 18 inches in length on the hat channel, along the longitudinal axes near the wing root. A fragment of the helicopter's canopy was found lodged in the hat channel on the airplane's undercarriage.

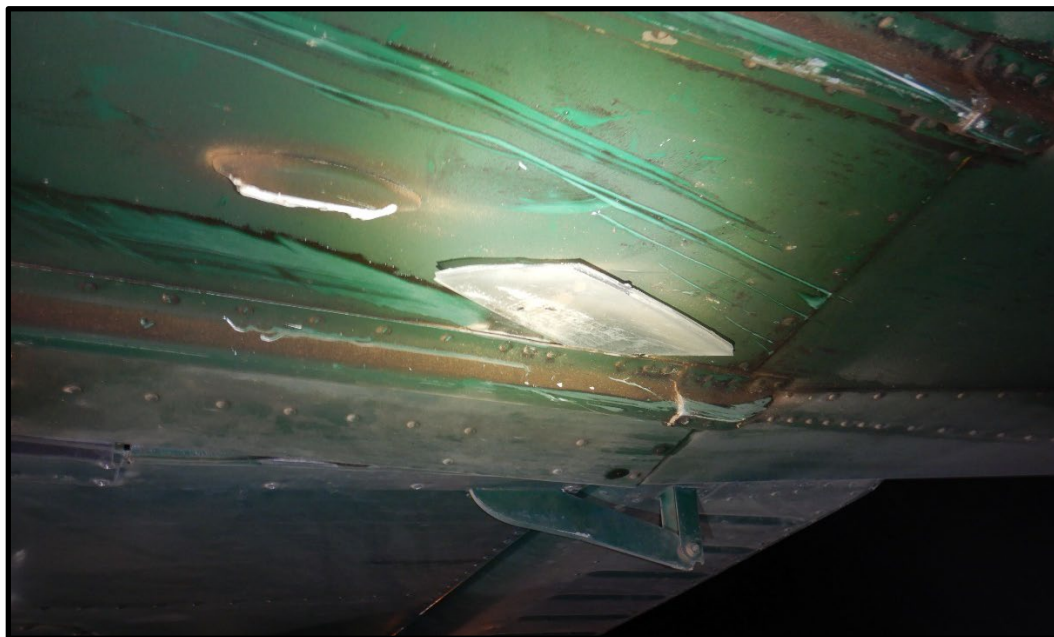


Figure 8: view of helicopter's canopy lodged in airplane hat channel (photo courtesy of Piper)

No damage was observed to the empennage. The vertical stabilizer, rudder, horizontal stabilator and stabilator trim tabs remained attached and secured to their respective mounts.

The right wing remained attached to the fuselage, and the flap and aileron remained attached to the wing via their respective mounts. The fuel tank fuel cap was observed in place and secure. The flap was observed in the “down” position. Damage was observed to the right flap trailing edge near the wing root.

The right main landing gear remained attached to the right wing. Impact damage was noted on the right main landing gear strut fairing from the aft section to the landing gear.



Figure 9: view of airplane right main landing gear (photo courtesy of the FAA)

3.0 Airplane Engine Examination

No damage was observed to the engine cowling and engine. The engine cowling remained attached to the fuselage and the engine remained attached to its mounts.

The 2 bladed propeller assembly remained attached to the crankshaft. For the purposes of this investigation One propeller blade was lettered A and the other propeller blade was labeled B. Propeller blade A remained attached to the propeller hub, and was bent about 90° aft, about 6 inches from the propeller tip.

Propeller blade B remained attached to the propeller hub. A yellow paint mark about 4 inches in length, near the propeller tip on the cord side and was bent about 90° forward, about 9 inches from the propeller tip.



Figure 10: View of airplane propeller

4.0 Helicopter Airframe Examination

GPS Location: 33.261842, -111.817718

Examination of the helicopter accident site revealed that the helicopter impacted terrain about .5 mile southwest of the approach end of runway 04R. The helicopter came to rest on its left side, on a heading of about 53° magnetic, at an elevation of 1,236 ft msl. No visible ground scars were observed surrounding the wreckage. All major structural components of the helicopter were located within about 15 ft of the main wreckage.

The airframe was mostly consumed by fire except for the aft tail cone. The instrument panel, and the navigation/communication unit separated from their respective areas in the cockpit and had sustained impact and thermal damage. The cockpit mixture control was in the full rich position and the carburetor heat control was impact and thermal damage



Figure 11: View of helicopter wreckage

Flight control continuity was not established due to impact damage, multiple separations, and thermal damage.

The left and right tail rotor pedal assemblies sustained extensive impact and thermal damage. The right-side pedals were thermal and impact damaged. The left side removable pedals were installed, impact and thermal damaged.

The cyclic was impact and thermal damaged. The removable cyclic was installed. The left side of the cyclic grip weldment was separated near the center post. The right side of the cyclic grip weldment remained attached to the center post. The push-pull tube assemblies were thermal and impact damaged throughout.

The collective control assembly was impact and thermal damaged throughout. The pilot's side collective was identified; however, the position of the collective could not be determined due to extensive impact and thermal damage.

The right landing gear skid was impact and thermal damaged. The right skid toe was separated forward of the right forward strut. The left skid was impact and thermal damaged. The left skid strut was bent aft and partially separated.

The tail cone remained attached to the upper tube frame and was rotated 180°. The tail cone had thermal damage from the tail cone attachment to about mid span. The tail cone had a partial separation 18 inch from the tail cone attachment and bending throughout consistent with impact damage.



Figure 12: View of helicopter main rotor system

The empennage was separated from the aft tail cone bulkhead. Crushing and bending consistent with impact was noted throughout the vertical stabilizer. The horizontal stabilizer was bent about 4 inches from the vertical stabilizer consisting with impact damage.



Figure 13: view of helicopter empennage

The tail rotor remained attached to the tail rotor gearbox; however, the tail rotor gearbox was fracture separated from the tail cone. The pitch change bearing moved freely with no binding. Tail rotor blade serial number 10368 was bent about 30° toward the trailing edge constant with impact damage.



Figure 14: view of helicopter tail rotor

5.0 Helicopter Engine Examination

Examination of the helicopter engine revealed that the engine remained attached to the engine mounts. Extensive thermal damage was noted throughout the engine. All four cylinders remained attached.



Figure 15: view of helicopter engine

The main rotor system sustained extensive impact and thermal damage. The main rotor gearbox remained attached to the upper tube frame in its normal position and had been fractured and thermally damaged. The main rotor mast and main rotor gear box were both thermally damaged; the main rotor mast remained attached to the main rotor gearbox.



Figure 16: view of helicopter main rotor system

The main rotor hub assembly components exhibited varying degrees of visible damage consistent with sudden stoppage from impact with terrain. The swashplate remained attached to the main rotor mast. Both main rotor blades remained attached to the main rotor hub but were destroyed.

The pitch change link of main rotor blade “A” was fracture separated near the rod end connection to the pitch change horn, consistent with impact damage. Blade “A” was fractured approximately 31 inches from the blade root. A separated section of the spar of blade “A” (about 76 inches in length) was collocated with the main wreckage and bent down about mid span.

The pitch change link of main rotor blade “B” remained attached to the swashplate and the pitch change horn of the blade. Blade “B” was fractured approximately 75 inches from the blade root and was bent down and toward the trailing edge.

A 51-inch section of main rotor blade was located about 122 ft west of the main wreckage. The blade section was bent at approximately a 60° angle with the lower surface of the blade on the inside of the bend. There were multiple punctures on the lower skin of the blade and one circular puncture mark on the upper surface of the blade near the bend of the spar.

An approximately 41-inch section of blade was found 330 ft north of the main wreckage location. A portion of the tip cover remained attached to the blade section. There were black transfer marks on the upper skin of the blade section near the tip and an arc shaped scuff mark that extended from near the tip of the blade towards the trailing edge and inboard 16 inches. The blade was crushed towards the trailing edge on the fractured end and the spar at the fracture was dented in. There was a portion of upper skin from the main rotor approximately 22-inch length found in the debris field.

Submitted by: Eric M. Gutierrez