



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

October 5, 2021

AIRFRAME AND ENGINE EXAMINATION

WPR20LA024

This document contains 20 embedded photos.

A. ACCIDENT

Location: Ogden, Utah
Date: November 17, 2019
Aircraft: Piper Aircraft, PA 28R, N3206R
NTSB IIC: Fabian Salazar

B. EXAMINATION PARTICIPANTS:

Name: Fabian Salazar
IIC
National Transportation Safety Board
Federal Way, WA 98003

Name: Mark Platt
Sr, Air Safety Investigator
Lycoming Engines
Phoenix, AZ.

Name: Kathryn Whitaker
Air Safety Investigator
Piper Aircraft
Phoenix, AZ.

C. SUMMARY

Examination of the airframe and engine occurred on February 24, 2020, at Air Transport Recovery, Phoenix, AZ. After examination there was no evidence of mechanical malfunction of failure with the airplane that would have precluded normal operation.

D. DETAILS OF THE INVESTIGATION

Airframe Examination

FUSELLAGE

The Airframe was in two large halves connected by wiring and cables. The first half consisted of the engine nacelle area and floor back to the rear seat aft bulkhead. The second half consisted of the upper cabin roof and extended back to the empennage. The separation appeared to be mostly from the accident, but some cutting by first responders were present.

The right door was detached from the fuselage, and a section of the fuselage remained attached to the hinges. The door latch was in the LATCH position.

Right side fuselage. The composite lower engine cowlings were flattened and fragmented. The upper composite engine cowlings separated from the airplane and were found with the wreckage. The rear fuselage, behind the aft seat bulkhead, on the underside, was damaged and fractured with upward deformation.

EMPENNAGE

The right side of the stabilator remained attached to the fuselage. It exhibited wrinkling and denting along the span. The composite tip remained attached and exhibited minor damage. The right side of the stabilator trim remained attached at the inner and outer hinge and exhibited bending and wrinkling along the entire span. The outer end nearest the tip cap, was bent towards the rudder. The inner hinge was missing the pin.

The vertical stabilizer remained attached to the fuselage. And exhibited minor damage. The rudder remained attached to the vertical stabilizer at the top and bottom hinges, exhibited minor damage and moved fully left and right.

The left side of the stabilator separated at the root from the empennage and was in the wreckage. The leading edge exhibited a large dent pushing inward toward the trailing edge. The entire surface of the stabilator was wrinkled and dented. The composite tip cap remained attached to the stabilator and exhibited fracturing from the leading edge aft. The left stabilator trim remained attached to the stabilator at the three hinges. The trim exhibited a large bend near the root, pushing upward from underneath.

The left-side aft fuselage exhibited a large dent originating from the bottom of the fuselage, about 7 feet from the tail end. The dent consisted of large tears in the skin and created an opening from the bottom of the fuselage to about mid-way to the top. From that point, the top of the fuselage had crushed downwards.

The left side of the cabin remained attached to the lower fuselage at mid-pillar of the cabin. The A-pillar had detached from the fuselage allowing the entire cabin roof to displace to the left, over the left-wing root. The fuselage forward of the instrument panel exhibited thermal damage and separation of the fuselage from the underside. The fuselage split from the underside of the fuselage upwards along a line beginning near the leading edge of the left wing. The engine area exhibited thermal damage.

CABIN

The fuel selector was in the LEFT position. All detents checked OK. No fuel residue was found in the lines.

Ignition Keys: LEFT position

Instruments:

Airspeed Indicator: 0 Knots

Attitude Indicator: about 45° Right, about 20° down

Altimeter: 4,420 feet

RMI: 298°

Turn Coordinator: Level

VSI: 0 FPM

OBS: 178°

Hobbs: 5358.13

Tach Time: 0390.3

Throttle: Mid-range
Propeller: Mid-range
Mixture: Mid-range
Landing Gear selector: Up
Flap Handle: 25°
Emergency Gear extension override lever: Near the normal (non-override position).

FLIGHT CONTROL CONTINUITY

Flight control continuity was established from the control yokes to the recovery cuts at the wings and from the recovery cuts at the wings to the ailerons. Control continuity was established from the rudder pedals to the rudder; from the control yokes to the stabilator, and from the throttle to the fuel servo. The continuity of the flaps was established from the flap handle to the torque tubes.

WINGS

The right wing was removed from the fuselage for recovery. The main landing gear separated from the underside of the right wing. The flap separated from the right wing. The spar fractured at the root of the blade. A large section of the leading edge at the tip, inboard to about 30 inches separated from the wing. There were indications of contact with an object about 30 inches inboard of wing tip. A large gouge extended to the underside of the wing, ripped the sheet metal and structural components of the wing aft toward the trailing edge. The forward half of the wing separated at a seam line about 130 inches from the wing tip, forward of the main landing gear bay. The aileron remained attached to the wing at the three attachment points and exhibited damage directly in line of the large sheet metal rip in the underside of the wing. The flap separated from the wing at the attachment points and exhibited wrinkles and dents throughout its span.

The left wing remained attached to the fuselage and was cut about 27 inches from the wing root for recovery. The left-wing root and 27 inches of the left wing remained attached to the fuselage. This section of the wing exhibited an upward bend. The wing tip exhibited a contact point at the leading edge that created a hole about 6 inches in diameter. A dented and wrinkled area near the trailing edge was present near the hole. The stall warning tab was bent aft. The pitot sensor was separated from the wing at the screws but retained to the wings by the tube. An area of dents and wrinkles pushed aft towards the trailing edge was exhibited about 90 inches from the wing tip. The aileron remained attached to the wing at the three hinges and exhibited minor damage. The flap was separated from the wing at the three attachment points and exhibited wrinkles and dents throughout its span.

LANDING GEAR

The right main landing gear separated from the underside of the wing at the attachment points and was in the wreckage area. The landing gear actuator was extended. The oleo strut was charged and extended. The brakes were intact and appeared normal. The brake line separated from the wing at the wing attachment point. The wheel and tire exhibited minor damage.

The left main landing gear separated from the underside of the wing at the attachment points. The landing gear was found in the wreckage area intact. The landing gear actuator was extended. The oleo strut was charged and extended. The brakes were intact and appeared normal. The brake line separated from the wing at the wing attachment point. The tire and wheel exhibited minor damage.

The nose gear assembly remained partially attached to the engine mount frame assembly and was not displaced aft. The wheel separated from the assembly. The strut assembly fractured at one attachment point.

ENGINE

The engine remained partially attached to the airframe by the engine mounts. Mechanical continuity was established utilizing a drive tool at the propeller drive pad. Thumb compression was obtained in the proper firing order. All valves moved consistent with normal operation. All accessory gears and drives were observed to turn properly. Borescope examination of the cylinders found no evidence of foreign object ingestion or detonation.

The oil filter was cut open to expose the filter media, which remained free of visible contaminants.

The fuel injection servo remained securely mounted. The throttle and mixture controls remained secure at their respective control arms. The fuel lines were secure at each B nut at their respective components. The fuel injection nozzles were secure at their respective cylinders, with the fuel lines attached. The fuel flow divider remained secure at its mounting bracket with the injection lines secure. The fuel injection nozzles were unobstructed. The fuel flow divider diaphragm remained intact. The fuel injection servo fuel inlet filter screen was free of visible contaminants.

The fuel pump remained secure at the mounting pad with the fuel lines secure at the respective fittings. The diaphragm remained intact. There was no evidence of visible contaminants. The gascolator did not remain secured at its mounting point and was in the wreckage. The filter screen was free of any pre-impact contaminants but retained some fire suppression compound. The fuel injection system and induction remained free of obstructions to flow.

The magnetos remained secure at their respective mounting pads, with their ignition harnesses secured at the magnetos and their respective spark plugs. The magneto to engine timing could not be ascertained due to the destruction of the flywheel. Each magneto sparked at their respective leads during hand rotation of the drives. The spark plugs were removed, and the electrodes remained free of mechanical damage. The number two and four sparkplug electrodes were covered with oil due to the engine positioning at the accident site and post-accident recovery.

Both muffler baffles remained intact and free of obstruction to internal flow

Propeller.

The propeller separated from the engine at the flange. One blade exhibited a 90° chord-wise bend. The tip of the blade separated. There were minor gouges in the leading edge from the shank to just beyond the bend where larger gouges were present along the leading edge. The other blade exhibited small gouges at the leading edge and was also missing the tip of the blade. The separation surface was rough and jagged. The spinner exhibited minor dents and gouges compared with the severe damage to the propeller.

RECORDS

A copy of the airplane's Service Bulletin were not found in the POH as required.

PHOTO GALLERY



Figure 1. N3206R front view at the accident site: Photo courtesy of the FAA.



Figure 2. View of the billboard struck by N3206R. Photo courtesy of the FAA.



Figure 3. Photo taken from a previous flight showing the Gear in Transit light illuminated.



Figure 4. View of N3206R at the recovery site.



Figure 5. Right-side view.



Figure 6. Top-side view.



Figure 7. Left outboard wing section.



Figure 8. Outboard section of left wing and left main landing gear.



Figure 9. Left flap.

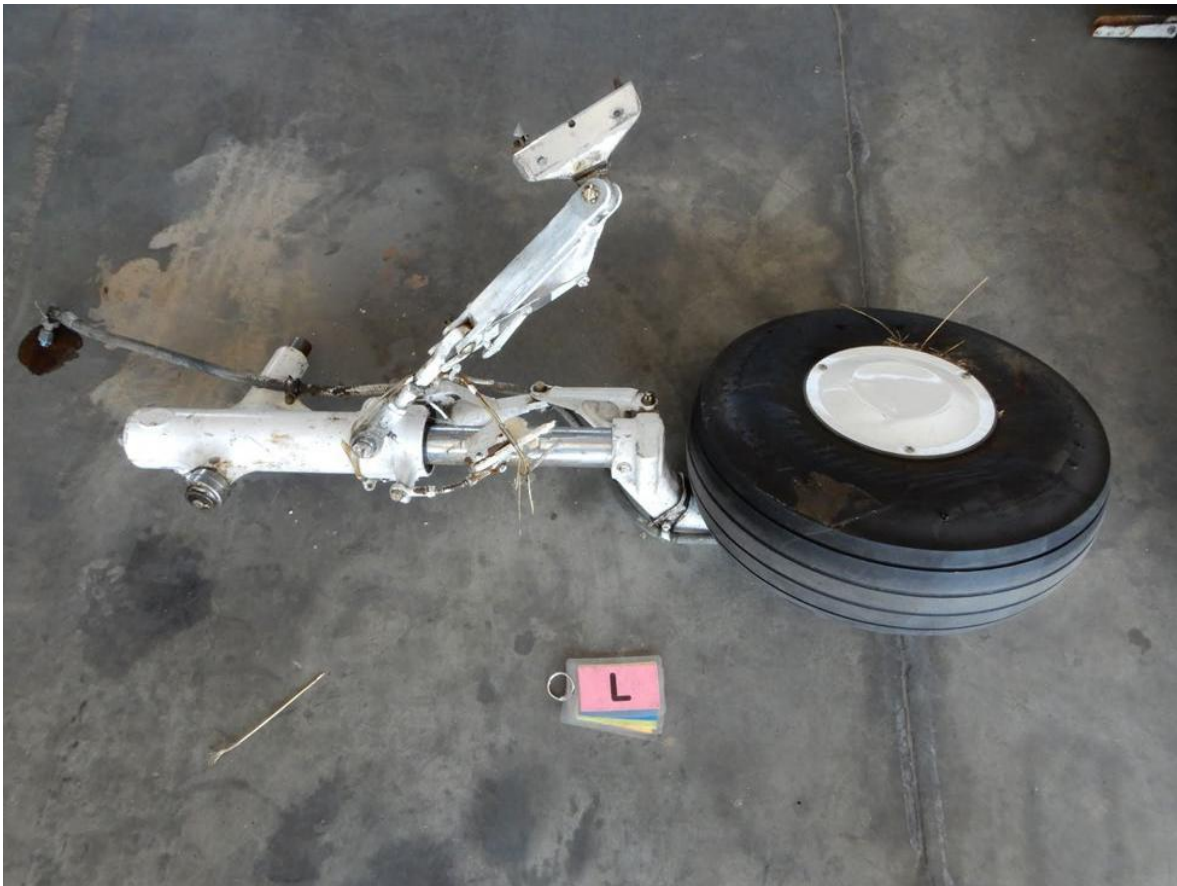


Figure 10. Left main landing gear.



Figure 11. Right wing and right flap.



Figure 12. Underside of the right wing and right main landing gear.



Figure 13. Left side of the fuselage showing the backup landing gear system pressure static head.

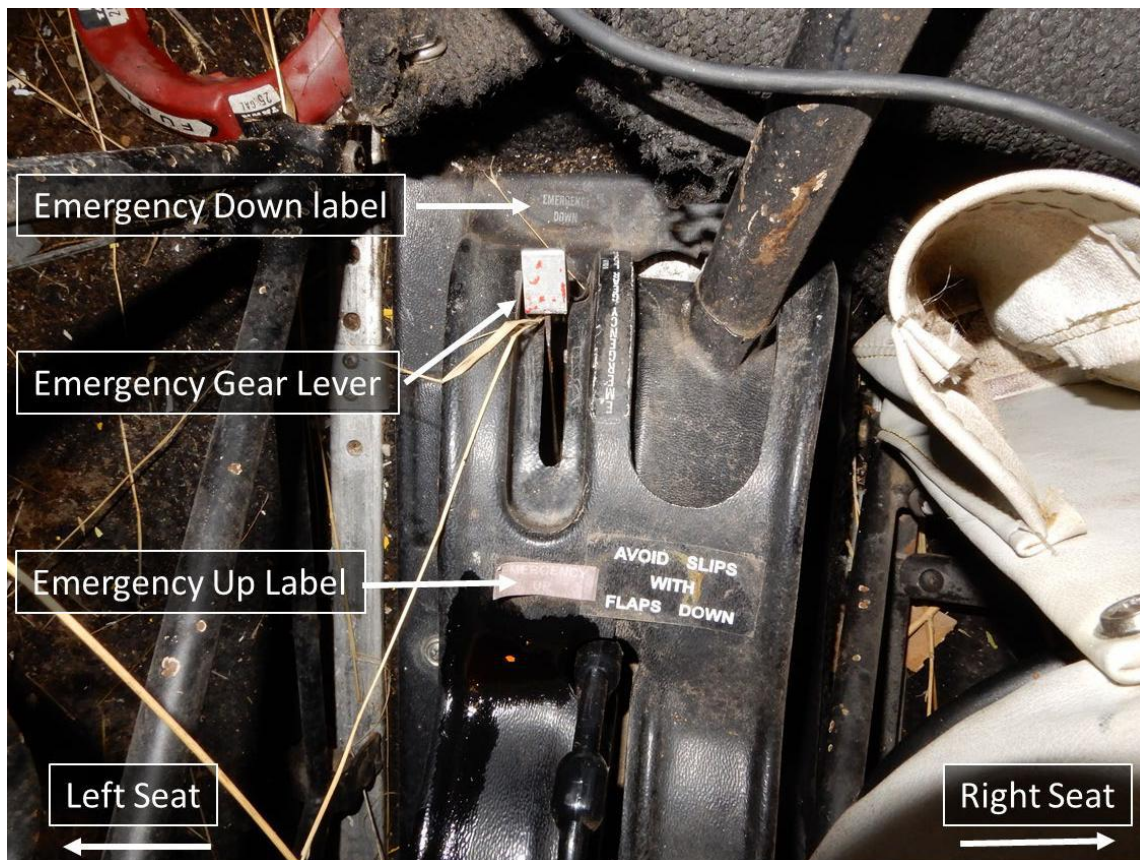


Figure 14. Emergency gear extension override lever.



Figure 15. Right side of the engine.



Figure 16. Left side of the engine.



Figure 17. Front of the engine.



Figure 18. Rear of the engine.



Figure 20. Image showing the main landing gear handle in the up position.