

Honeywell Aircraft Accident Field Notes Prepared for the NTSB
Accident Number: WPR20LA211, Payson, AZ, July 07, 2020
Bell UH-1H, Registration: N623PB, S/N: 64-13689

Background

On July 07, 2020, at approximately 12:15 MST, a Bell¹ UH-1H helicopter, N623PB, impacted the ground while carrying supplies for hotshot firefighter crews working on the Polles Fire. The fire was located approximately 10 miles west of Payson, AZ. The pilot and sole occupant sustained fatal injuries; the helicopter was destroyed.

According to the Forest Service Safety Officer on duty at the time of the accident, the helicopter was flying a load of Gatorade from the H2 helipad to the H5 helipad using a long-line.

The helicopter wreckage was examined by two Honeywell investigators and a Forest Service helicopter inspector pilot on July 08, 2020 at the accident site. Oversight was provided by the USDA Forest Service on behalf of the NTSB. Coordinates of the approximate center of the helicopter were: 34° 16'18.52"N 111°31'38.98"W with an elevation of 4367 ft.

Aircraft Information

The aircraft dataplate was not located during the on-scene examination.

A Garlick Helicopters Inc. dataplate on the vertical tail listed the following information:

P/N: STC SR09176RC

S/N: GH080

Work Order: 3812

The aircraft was equipped with a T53 series engine, but the engine dataplate was not accessible.

Overall

Note: These are general observations, since Honeywell is not the TC holder, the nomenclature may not be standard.

An aerial view of the helicopter wreckage is in [Figure 1](#). The helicopter wreckage was on an approximately east-west heading, with the nose pointing to the east and the tail pointing to the west. The main rotors were on the north side of the main wreckage and the skids were on the south side of the main wreckage. The helicopter in general was heavily fire damaged, the tail had less fire damage than the fuselage. The fuselage of the helicopter appeared to have impacted on its left side. The tail

¹ Registration information downloaded as of 07/14/2020 the FAA Registry lists the helicopter as a Bell UH-1H. <https://registry.faa.gov/aircraftinquiry/NNum_Results.aspx?NNumbertxt=N623PB >

section of the helicopter appeared to be rotated 180° in the downhill (south) direction, resting on its right side.

Main Rotor

Note: The main rotor blades were arbitrarily labeled “Blade A” and “Blade B” for ease of reference throughout this report. The blades are labeled in [Figure 1](#).

Both blades of the main rotor sustained fire damage ([Figure 2](#) and [Figure 3](#)). The main rotor section was the northern-most portion of the debris field (furthest uphill). The two blades remained attached at the hub ([Figure 4](#)). One of the main rotor blades (Blade A) was bent approximately 130° back on itself in the uphill direction ([Figure 5](#)). There was a ground scar near the tip of Blade A ([Figure 6](#), [Figure 7](#), [Figure 8](#), [Figure 9](#), and [Figure 10](#)). The ground scar was on a 026°/206° heading. [Figure 11](#) attempts to illustrate the angle of attack in which the blade impacted the sloping terrain, using a notebook for a visual reference. The main rotor blade on an approximate east-west heading (Blade B) was broomstrawed at the tip ([Figure 12](#) and [Figure 13](#)). There was what appeared to be scarring and fracturing on the rock that the Blade B tip was located by ([Figure 14](#)). The transmission was separated from its mounted location, it was heavily impact and fire damaged ([Figure 15](#)). The mast was fractured and the main rotor blades were not attached ([Figure 16](#)). The transmission was oriented on an approximate 100° heading. The free-wheeling portion of the transmission input rotated without resistance.

Cockpit

The cockpit section was heavily fire and impact damaged ([Figure 17](#), [Figure 18](#), and [Figure 19](#)). The cockpit was located due south (downhill) of the main rotor blade attachments.

Cargo Area

The cargo area was heavily impact and fire damaged ([Figure 20](#)). The cargo hook was found in the closed position ([Figure 21](#)). The k-flex coupling was fractured from its attachment points and found in the cargo section.

Skids

There was re-solidified melted metal running downhill from where the skids were located ([Figure 22](#) and [Figure 23](#)). The skid crossmembers appear to be rotated aft of their normal position ([Figure 24](#)) and appear to have been displaced to the right side of the helicopter ([Figure 25](#)). The left side skid was located under the right-most section of the fuselage, with the crossmembers and right skid all visible and downhill (South) of the main wreckage. The crossmember mounting brackets on the aft crossmember appear to have been displaced and were not visible. There was metal scraping visible on the left side of where the aft left-hand mounting brackets appeared to have been located ([Figure 26](#)).

Firewalls

The left side of the forward firewall was partially crushed. The left side of the aft firewall was partially crushed. The firewalls can be seen in [Figure 27](#), [Figure 28](#), and [Figure 29](#). One of the lines attached to the oil tank displayed a wet appearance. The fluid's identity was not confirmed through analysis but was assumed to have been engine oil.

Engine

The engine was displaced and separated from its mounts. It was positioned slightly uphill (north) and rolled CCW aft looking forward (Figure 30 and Figure 31). The inlet guide vanes (IGVs) displayed battering and impact damage (Figure 32). The first stage compressor blades displayed tearing and battering damage with portions of the blade material bent opposite the direction of rotation (Figure 32). Rotation of the output shaft produced a corresponding rotation of the power turbine rotor. There was a faint squeal during the rotation of the power turbine section, that appeared to be the result of contact between the output shaft and the displaced and damaged static structure around the engine inlet. There was no visible damage to the 2nd stage power turbine blades or stator vanes (Figure 33).

Tail

The tail boom was impact damaged and fragmented (Figure 34). There was partial fire damage – not as much as the rest of the wreckage. It was separated from the rest of the helicopter just forward of the horizontal stabilizer mount (Figure 35 and Figure 36). The horizontal stabilizer was displaced from the tail boom. The left-hand stabilizer was torn from its structural arm attachment and exhibited compression/crushing damage (Figure 37). The tail rotor drive shaft was fractured and fragmented along its length, there was thermal damage in some places (it was completely melted between the forward and aft firewalls, shown in Figure 38). The tail rotor drive shaft input into the 45° gearbox could be minimally rotated. The control cable inputs were present but continuity was not verified (Figure 39). One of the tail rotor blades was fractured, partially separated, and a portion of the leading edge remained within the vertical fin (Figure 40) where it appears as if it was driven into the tail rotor drive shaft between the 45° gearbox and the 90° gearbox (Figure 41). The other tail rotor blade was intact but exhibited impact damage (Figure 42 and Figure 43). The 90° gearbox was separated from its mount and fractured, it was oriented on the opposite side of the tail boom from its normal position (Figure 44). The vertical fin exhibited crushing/buckling along the structural section.

Note: During the on-scene investigation, the tail rotor gearbox assembly was moved to help visually orient it (Figure 45). A number of pictures were taken before the gearbox assembly was moved, and pictures were taken of the process as well.

Long-Line and Cargo Load

The long-line and cargo load were found southeast of the wreckage. Using GPS coordinates, the distance from the center of the wreckage to the cargo load location was approximately 123 feet on a 111° heading. Figure 46 shows the view uphill to the wreckage from the resting place of the long-line top fitting. The long-line was laying on top of some trees (Figure 47) and the load was found still attached to the bottom hook (Figure 48 and Figure 49). The load appeared to have impacted some trees in an east-northeast direction (Figure 50). The top fitting appeared to be undamaged and there was a wire with exposed ends present (Figure 51).

Photos



Figure 1. Overall View of Wreckage from Above



Figure 2. Main Rotor Blades (Looking East)



Figure 3. Main Rotor Blades (Looking Southwest)



Figure 4. Main Rotor Blades Attached at Hub



Figure 5. Main Rotor Blade A



Figure 6. Ground Scar Near Tip of Main Rotor Blade A



Figure 7. Ground Scar



Figure 8. Ground Scar



Figure 9. Ground Scar



Figure 10. Ground Scar



Figure 11. Ground Scar with Notebook Showing Angle



Figure 12. Main Rotor Blade B



Figure 13. Broomstrawed Tip of Blade B



Figure 14. Scarring and Fracturing on Rock by Blade B Tip



Figure 15. Transmission Position



Figure 16. Transmission Mast



Figure 17. Cockpit, Approximate Area Circled (Looking East)



Figure 18. Cockpit, Approximate Area Circled (Looking North)



Figure 19. Cockpit, Approximate Area Circled



Figure 20. Cargo Area



Figure 21. Cargo Hook in Closed Position



Figure 22. Re-Solidified Melted Metal Running Downhill



Figure 23. Close-Up of Re-Solidified Melted Metal



Figure 24. Skid Crossmembers Rotated Aft



Figure 25. Skids Displaced on Right Side of Helicopter



Figure 26. Scrape Marks on Aft Skid Crossmember



Figure 27. Firewalls with Engine



Figure 28. Firewalls Aft Looking Forward (Looking East)



Figure 29. Firewalls Forward Looking Aft (Looking West)



Figure 30. Engine Displaced and Separated from Mounts



Figure 31. Engine Rolled CCW (Aft Looking Forward) Slightly Uphill



Figure 32. IGV and Compressor Damage



Figure 33. No Visible Damage to 2nd Stage Power Turbine Blades or Stator Vanes



Figure 34. Overall Tail Section (Looking East)



Figure 35. Overall Tail Section (Looking West-Northwest)



Figure 36. Tail Section Separation



Figure 37. Left Hand Stabilizer



Figure 38. Melted Tail Rotor Drive Shaft



Figure 39. Control Cables Present



Figure 40. Piece of Tail Rotor Blade Embedded in Vertical Tail



Figure 41. Damage between 45° Gearbox and 90° Gearbox and Damaged Tail Rotor



Figure 42. Impact Damage on Intact Tail Rotor Blade Side 1



Figure 43. Impact Damage on Intact Tail Rotor Blade Side 2



Figure 44. 90° Gearbox Separation



Figure 45. Moving the Tail Rotor/90° Gearbox



Figure 46. View Uphill (Looking Northwest) Towards the Wreckage from the Long-Line Top Fitting Location



Figure 47. Long-Line Draped Over Trees



Figure 48. Long-Line Load Attachment Hook Closed



Figure 49. Cargo Load



Figure 50. Damage to Tree from Cargo Load (Looking East)



Figure 51. Long-Line Top Fitting