



NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety

WRECKAGE EXAMINATION GROUP FIELD NOTES

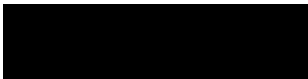
October 15, 2021 (date field notes signed)

A. ACCIDENT WPR21LA268

Location: Weed, CA
Date: July 7, 2021
Time: 1645 Pacific Daylight Time (PDT)
Operator: Rogers Helicopters Inc
Aircraft: Bell 212
Registration: N911KW

B. PARTICIPANTS or GROUP NAME:

Use the table below for field notes where you will need signatures for concurrence. Field Notes will be OUO and not released.

I <u>concur</u> that the contents within the following “Field Notes”, accurately reflects the information gathered during the examination.		
NAME	SIGNATURE	DATE
IIC- Eleazar Nepomuceno National Transportation Safety Board Federal Way, WA		10/15/2021
Michael Lenard Party (Federal Aviation Administration) Sacramento, CA		10/15/2021
Jason McGovern Party (United States Forest Service) McClellan, CA		10/15/2021
Mark Stuntzner Party (Bell) Fort Worth, TX		10/15/2021

Gary Poteet Accredited Representative (Pratt & Whitney Canada) Escondido, CA	[REDACTED]	10/15/2021
John Vinson Accredited Representative (Pratt & Whitney Canada) Portland, OR	[REDACTED]	10/15/2021

C. SUMMARY

On July 7, 2021, about 1450 pacific daylight time, a Bell 212 helicopter, N911KW, was substantially damaged when it was involved in an accident near Weed, California. The pilot was not injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 133, external load flight.

The pilot reported that he was on approach to a lake to retrieve water for a water bucket drop operation. As he continued the approach, about 400 feet above the ground, the instruments scanned normal. When the helicopter crossed the shoreline, he placed his head in the left door bubble and visualized that the 100-foot line and bucket were slightly trailing the helicopter. Shortly after, he felt a “stronger than typical” lateral “one per” revolution vibration. He aborted the water retrieval and intended to return to base, however, the helicopter began to settle. He applied forward cyclic input and raised the collective, but the helicopter continued to descend. He quickly realized that he would not fly out of the descent, so he concentrated on a forced water landing. After he leveled the helicopter and the skids touched down on the water, he made a last attempt to takeoff, but the helicopter settled in the lake. He reduced both throttle settings to idle in preparation to ditch the helicopter and applied right cyclic as the main rotors slowed. The helicopter rolled right, and the main rotor blades struck the water. He waited for movement to cease and then exited out the left door and swam safely to shore. The helicopter was submerged in the lake.



Figure 1 – Flight Track of N911KW

D. DETAILS OF THE INVESTIGATION

The helicopter was recovered to Plain Parts in Pleasant Grove, CA where an examination was completed on October 13-14, 2021.

1.0 Airframe Examination

The helicopter, a 1973 Bell 212HP, serial number 30592, came to rest on its right side submerged in a lake. The airframe has about 14,675.5 total time, 288.5 Hobbs time. The last inspection was on April 26, 2021. A detailed examination report from the airframe manufacturer will be provided at a later date.

1.1 Fuselage

The nose section exterior was intact with no visible damage from water impact. Its nose compartment door latches were intact and secured. The battery and avionics within the nose compartment were connected and secured. The right and left side chin bubble were damaged and missing pieces. The right and left windshield were not damaged and intact. The nose mounted pitot tubes were intact. The forward cabin exterior had minimal impact damage. The crew doors, hinged doors, and pilot doors were intact with positive latching. The right

cabin roof window was fractured and missing pieces. The cabin roof was intact with no visible buckling or impact damage. All electrical compartments access doors were intact and secured. Oil coolers and oil cooler lines were intact and secured.

1.2 Lower Pylon Area

The lower section of the transmission and its oil sump separated consistent with impact damage. The sump was devoid of oil. The hydraulic pump and its corresponding line were attached and secured. The lift link was secured with a slight torsional deformation. The synchronized elevator control linkages displayed overload from impact damage. The transmission support case was separated from all 4 corners mounts. Transmission freely rotated at the output quill without binding, which also rotated the rotor blade and mast. The 5th mount beam remained attached to the transmission; its beam was fractured on the left side about 3 inches from the pylon mount. The hydraulic pump was intact and secured to the transmission body. The four transmission corner mounts and 2 aft dampeners were still attached to the airframe. They were all removed and collected for further testing. The main driveshaft input quill was still attached to the transmission, but the main driveshaft was separated consistent with overload. Its chip detector was removed and found no debris. The right side of the transmission case sustained impact damage.



Figure 2. view of transmission

1.3 Tail Boom and Tail Rotor

The tailboom was intact and revealed minimal impact damage; it was separated at the time of the examination at its mounting bolts. Continuity of the tail rotor drive system was conformed

from the no.2 driveshaft to the tail rotor blade; manual rotation was smooth. The tail rotor no.1 driveshaft and its hangar bearing were intact and secured. The tail boom was separated for recovery at its mounting bolts. The tail rotor drive system was intact and secured. The tail rotor driveshaft covers were intact and showed damage consistent with the recovery efforts. The no.2 and no.3 tail rotor driveshafts were secured on hangar bearing and connected to the 42° intermediate gearbox. The 42° intermediate gearbox and the 90° gearbox were mounted and displayed no impact damage; the sight glasses showed that the oil level was at the recommended level. Both chip detectors revealed no metal fragments. The left synchronized elevator was cut during recovery; it revealed compression damage at its leading edge consistent with a main rotor blade strike. The right elevator was intact and had minimal impact compression damage. Continuity to the tail rotor was confirmed from the tail rotor control long tube to the tail rotor blades; manual actuation was smooth.

The vertical fin driveshaft cover had a witness mark about 1/3 span, consistent with a main rotor blade strike. The damaged tail rotor blade had a black paint transfer on its leading edge, about 17 inches across the leading edge, consistent with the bottom section of the blade impacting the leading edge of the tail rotor blade. Corresponding witness marks was found on the displaced blade body recovered from the accident site.



Figure 3. right photo: view of damage to vertical driveshaft cover and tail rotor blade; upper & lower left photos: view of close-up views of damage to leading edge

1.4 Main Rotor

The blade grip tension torsion straps were damaged, rotating them past its limits. The main rotor hub remained intact. The stabilizer bar was intact and its corresponding hydraulic reservoirs intact and a secured, filled with fluid consistent with hydraulic fluid. The mast remained attached to transmission; it showed paint wear from the main rotor hub static stops. The red and

white main rotor blades were removed from its corresponding blade grip during recovery. The red blade, part number 212-015-501-115, serial no. BH368215 sustained impact damage but mainly intact except that both pitch horns were separated from the attachment points on their respective grips. About 43 inches to 74 inches from the tip of the blade, a section of the blade revealed impact damage from the left synchronized elevator.

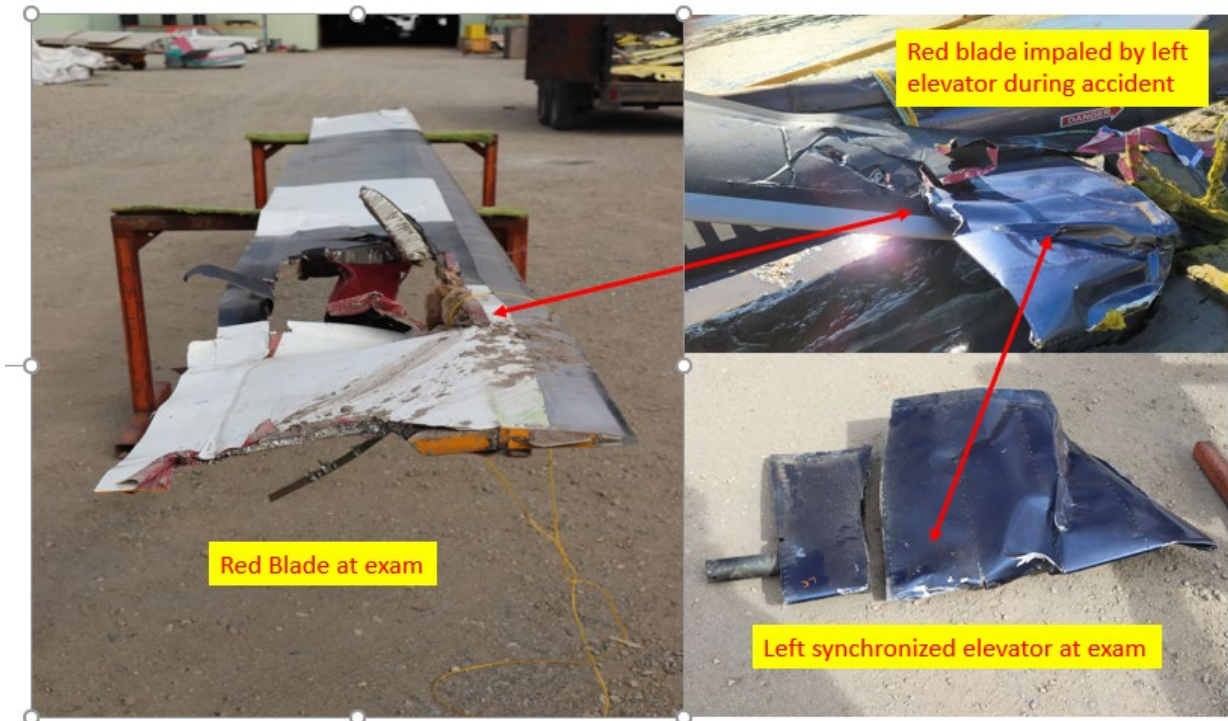


Figure 4. Left photo: view of red main rotor blade at exam; lower right photo: view of left synchronized elevator at exam; upper left photo: view of red blade impaled by left elevator during accident

The white blade, part number 212-015-501-115, serial no. A-4880, separated from the spar into two main sections. The span of the leading edge and the trailing edge were recovered along with two dislodged blade body pieces. The impact damage revealed that the main rotor blade struck the driveshaft cover from the outboard side and traveled inboard, which then struck the tip of a tail rotor blade (S/N A-18172). The outboard edge of the white blade's leading edge revealed a blue paint transfer consistent with the driveshaft cover and a yellow "paint" transfer, consistent with "paint" found within the tail rotor blade.



Figure 5. Left photo: view of white main rotor blade; middle and right photos: close-up views of outboard section of leading edge with paint transfers

1.5 Skids

The skid was separated from the fuselage prior to the investigation during recovery. The skids were intact with no visible damage.



Figure 6. View skid assembly

1.6 Flight Controls

Continuity confirmed from cyclic to left and right servos; actuation of forward left and right servos was smooth while moving cyclic left, right, fore, and aft. Continuity confirmed from collective stick-to-collective levers; actuation was smooth while moving collective up and down with corresponding movement of collective levers. The collective levers were separated at its forward attachment. The rear attachment point was attached to the collective servo control tube. The non-rotating swashplate forward right horn was intact with the right servo control tube attached and secured. The forward left horn was fractured from the body with the forward left servo control tube attached and secured. The rotating swashplate, scissors, drive links, and connecting linkages continuity was confirmed to the main rotor pitch control mechanism. The tail rotor continuity was confirmed from rudder pedals to tail rotor pitch control mechanism at the tail rotor blades. The left and right no.1 throttle control freely rotated. The left and right no.2 throttle control was bound.



Figure 7. View of damaged transmission

1.7 Fuel/Fuel System

Fuel tanks were intact. Jet fuel was sensed when the fuel cap was removed. Fuel was sumped during the recovery process. It was reported that fuel residue was seen and sensed at the accident site.

2.0 Engine Examination

The Power pack is a Pratt and Whitney Canada Inc, PT6T-3B, no.1 serial no. 063039 and no. 2 serial no. 062106.

The no.1 power section has a total engine time of 8,547.1 and a time since overhaul of 2,697.7. The no.2 power section has an engine total time of 10,949.2 and a time since overhaul of 2,377.4. The reduction gearbox, serial number 002529, time since overhaul was 2,526.5; the total time since new was not found in the maintenance records.

An external visual exam revealed minimal damage to the case, combining gearbox, and accessory gearbox. The no.1 and no.2 Automatic and Manual Fuel Control Units were impact damaged, but all corresponding fuel and air lines were secured. The no.1 fuel filter bowl was intact, fuel and water inside bowl, fuel filter had a small trace of debris with a clean filter. No.2 Fuel filter bowl was intact, fuel and water inside bowl, fuel filter had a small trace of debris, with a clean filter. Both no.1 and no.2 P3 filter bowls were intact; both filters had organic debris dispersed throughout its filter cleats; each bowl was filled with water and oily liquid. A borescope examination of the compressor and turbine sections for both no.1 and no.2 engine revealed minimal damage to the internal case and blades, with no evidence of catastrophic failures. A more detailed report will be provided by the engine manufacturer at a later date.