



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

December 18, 2015

WRECKAGE EXAMINATION SUMMARY

WPR16FA040

This document contains 15 embedded images.

A. ACCIDENT

Location: Superior, Arizona
Date: December 15, 2015
Aircraft: N74317; Airbus Helicopter AS350B3
NTSB Investigator-in-Charge: Andrew Swick

B. SUMMARY

Examination of the recovered wreckage was conducted on December 18th and 19th of 2015, at the facilities of Air Transport in Phoenix, Arizona, by the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), Federal Aviation Administration (FAA), Airbus Helicopter, Turbo Mecca and Air Methods. The postaccident examination of the wreckage revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

C. DETAILS OF THE INVESTIGATION

1.0 Wreckage Examination Fuselage



Figure 1-Main Wreckage, Forward Right Side View

The fuselage remained intact with impact damage to the nose section. The forward section of the floor board was crushed up and aft, limiting the movement of the anti-torque pedals. The cabin roof, windshield and the nose dome structure separated and were found with the main wreckage.



Figure 2-Main Wreckage, Left Side View

The rear equipment access doors and right rear cabin door remained attached to the fuselage; all other doors separated from the fuselage and were found in the debris field. The pilot seat remained attached to the buckled cabin floor and seat rail. The rear seats separated from the cabin and only the upper cross rail and three vertical rails remained attached to the aft bulkhead structure. The left vertical rail separated from the fuselage and was found with the wreckage. The medical center console separated from its floor mount and remained attached to cables. The gurney platform remained attached to the cabin floor.



Figure 3-Tailboom

The tailboom separated from the fuselage at the aft bulkhead and separated from the aft tail section forward of the horizontal stabilizers. This section of the tailboom had diagonal impact damage to the right side consistent with a main rotor blade strike. The aft tail section had minimal damage to the top vertical fin, and the lower vertical fin was bent to the right. The spring stinger was slightly bent upwards. The right horizontal stabilizer tip was crushed and a tree limb had pierced through the surface from the bottom up. The left horizontal stabilizer was undamaged.



Figure 4-Rear Fuselage



Figure 5-Tailrotor Drive Shaft

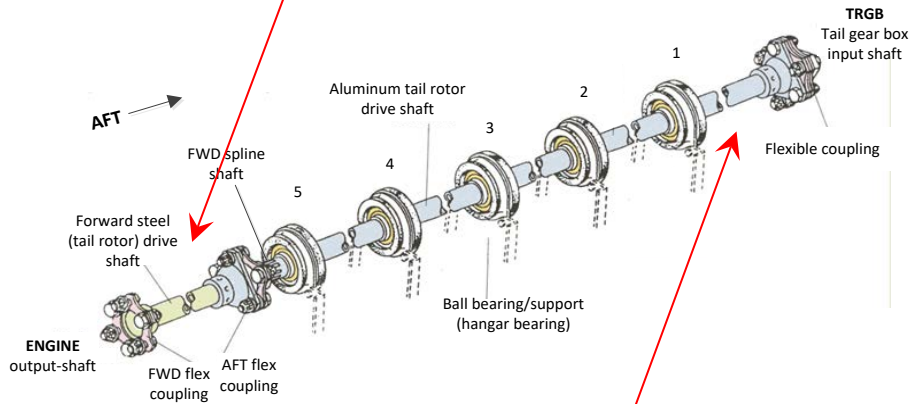


Figure 6-Tailrotor Drive Shaft

The aluminum tail rotor drive shaft was separated between the No. 1 and 2 hangar bearings. The forward spline was separated from the forward steel drive shaft. The flex coupling on the forward and aft sections of the forward steel drive shaft were damaged. The steel shaft had a twist near the aft flex coupling attachment flange.



Figure 7-Empennage

The tail rotor blades had minor damage. The tail rotor system rotated freely when turned through by hand at the tail rotor drive shaft. The tail rotor drive shaft was still attached to the tail rotor gear box input shaft flex coupling. The tail rotor gear box remained intact and the chip detector was removed and examined. The chip detector was clean with no metal particles noted. The empennage flight controls remained attached.

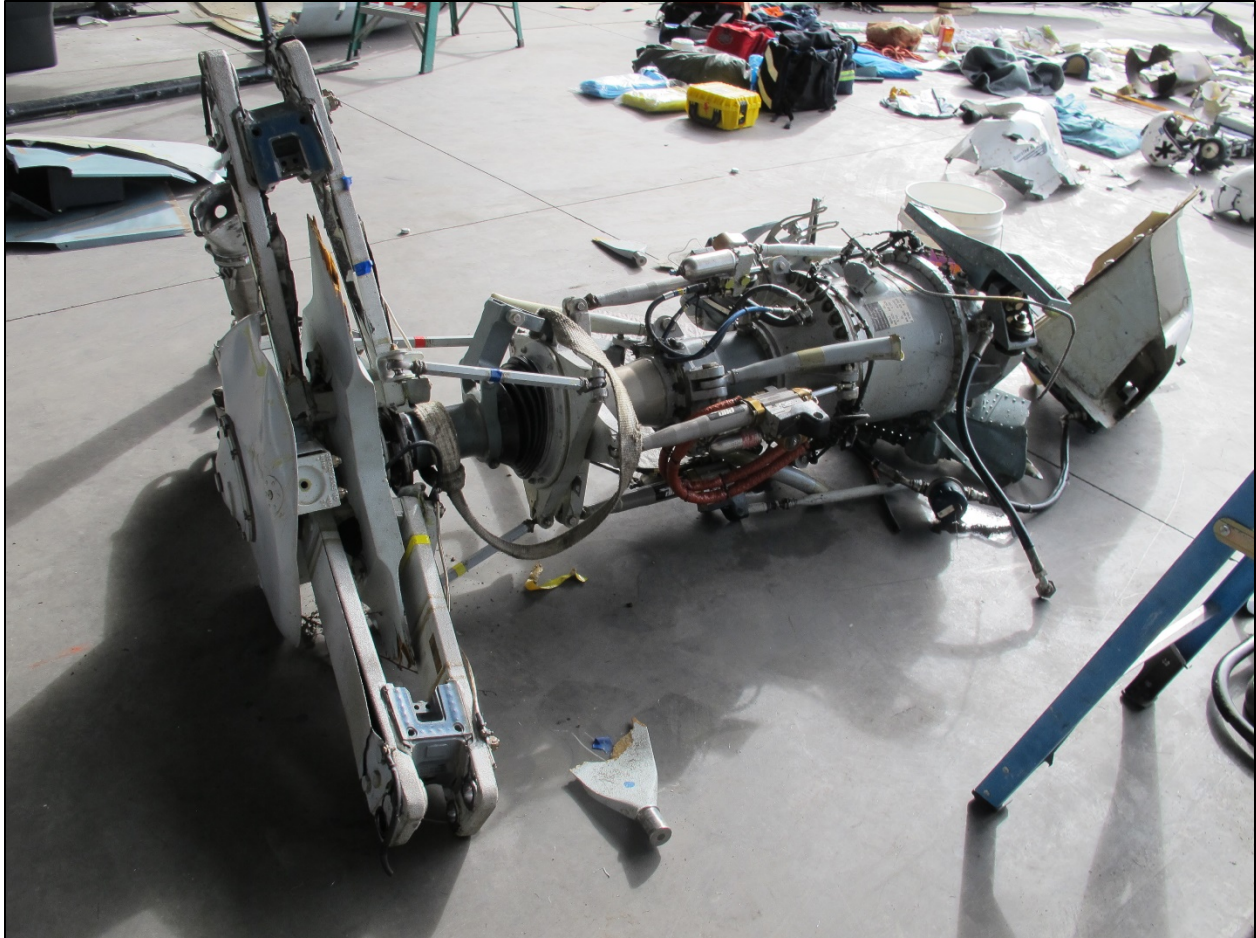


Figure 8-Main Rotor Drive Shaft and Transmission

The main rotor transmission separated from the aircraft during the accident sequence and all main rotor blades remained attached. The main rotor blades were removed from the rotor hub during the recovery of the wreckage.



Figure 9-Main Rotor Blades

The main rotor blades were removed from the rotor hub during the recovery of the wreckage. The blade sleeves and star arms were broken. The yellow blade end cap separated and the blade tip was frayed. The trailing edges of all blades had delamination and separation of material from the midsection to the tips.

The hydraulic pump remained attached to the transmission drive with the belt intact, however, was disconnected from the pulley. Continuity through the transmission was observed from the main rotor head to the input drive shaft when the main rotor head was turned through by hand. The transmission chip detector was removed and inspected. The chip detector was clean with no metal particles noted.



Figure 10-Cabin Area

The forward cabin area had impact damage and was buckled below the pilot seat area. The roof separated from the main wreckage. The helicopter was modified with an STC's medical interior configuration with the pilot and flight controls located on the forward right side. The pilot seat remained attached to the seat rails that remained attached to the buckled cabin floor. The pilot's seat belt (4-point restraint system) was still buckled; and cut by first responder to recover the pilot.



Figure 11-Cabin Area

The STC seat assembly configuration was: two seats on the right aft bulkhead, a medical console in the middle and a medical seat (with a short seat base) on the left with a litter on the forward left cabin. The rear seat assembly separated from the attachment bracket assembly that remained attached to the cabin bulkhead. The left vertical support for the rear seat attachment bracket assembly separated from the aft bulkhead.



Figure 12-Right and Middle Rear Seats

The flight-nurse, who was seated in the right rear seat, succumbed to his injuries. The flight-paramedic, who was seated in the left rear seat, sustained serious injuries. The middle seat was not occupied. The two occupants were separated from the rear seats, seatbelt use at both locations was not confirmed. The seatbelts for all three seat locations were found unbuckled during the onsite examination of the wreckage. The right and middle seats remained attached to the lower horizontal attachment bracket. Both seat hinges had impact damage.



Figure 13-Left Rear Seat

The left rear seat separated from the bulkhead attachment assembly. The seat back lower frame had deformation of its structure and the seat hinges had impact damage.



Figure 14-Engine

The engine remained attached to the fuselage by the rear mounts and clamps. First-stage compression blades had leading edge damage. The exhaust duct had impact damage.

The toes of both skids separated from the landing gear and were found with the main wreckage. The main rotor blades were separated from the hub assembly and all have impact damage. The transmission and hub assembly

The fuel tank was generally intact; however the tank had shifted forward inside the fuel cell area during the impact sequence. According to the fuel receipts indicated that the pilot added 51 gallons at Williams Gateway Airport (KIWA) before the departure for the mishap flight. The recovery team estimated they drained approximately 35 gallons. The tank was leaking (dripping from the belly fuel drain) for the two days it was at the accident site.

The cabin collective control lever remained installed, and the friction lock was found loose. The hydraulic isolation switch was in the off position. The collective's up and down movement was partially jammed below the floor area. The cyclic was jammed from below the floor area, and could not be moved freely. Flight control continuity was established from the forward cockpit input controls to the main rotor, and tail rotor control servos.



Figure 15-Instrument Panel

The complete instrument panel was separated from the aircraft and found approximately 200 feet further in the debris field at the accident site. All the instruments were in place on the panel. The H.S.I. needle was set at 270 degrees.

The 30-alpha panel was still attached in the cabin area; however, all the buttons were damaged from impact and not reliable for accurate positional reading.

The DECU, VEMD, and the Appareo GAU 2000, model 1F00, SN 462 unit was retained by the NTSB for further review.