



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Garey, California	Accident Number:	WPR24LA093
Date & Time:	February 23, 2024, 07:40 Local	Registration:	N2618W
Aircraft:	Bell 47G-3B-1	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Minor
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot of the helicopter was applying a chemical to a field when the engine sustained a loss of power. The pilot entered an autorotation and the helicopter descended to the terrain, where it rolled onto its right side substantially damaging the main rotor system and severing the tailboom.

Postaccident examination of the pneumatic air lines revealed that there was a slight air leak at the accumulator and a large air leak at a pneumatic air line (Pc) between the power turbine governor (PTG) and the fuel control unit (FCU); the Pc line was not connected to the FCU. The B-nut connecting the Pc line to the FCU had backed off, allowing the Pc line to become disconnected. . This Pc line is one of several lines that use air pressure to communicate fuel scheduling commands between the PTG and the FCU. The security of this line is necessary for proper engine operation. Engine operation without the Pc line properly connected would result in the FCU reducing fuel to a sub-idle condition, preventing the engine from producing sufficient power for continued flight.

No other preaccident mechanical malfunctions or failures were found that would have precluded normal operation.

Maintenance was performed on the helicopter 15 days and 29.2 flight hours before the accident that included checking all B-nuts for torque paint to ensure adequate torque remained on the B-nuts. Maintenance personnel likely did not properly inspect the condition of the torque paint on the affected B-nut, which resulted in a disconnection of the B-nut from the FCU and a total loss of engine power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Maintenance personnel’s failure to properly check the torque paint on a fuel control unit B-nut, which resulted in the loosening of the B-nut, a loss of engine power at a low altitude, and a subsequent impact with terrain.

Findings

Aircraft	Fuel control/carburetor - Incorrect service/maintenance
Aircraft	Climb capability - Attain/maintain not possible
Personnel issues	Scheduled/routine maintenance - Maintenance personnel

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of engine power (total) (Defining event)
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On February 23, 2024, about 0740 Pacific standard time, a Bell 47G-3B-1, N2618W, was substantially damaged when it was involved in an accident near Garey, California. The pilot received minor injuries. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight.

According to the pilot, he was about 5 ft above ground level (agl) at an airspeed of 40 knots conducting an aerial application of fungicide on a field when he then initiated a climb to clear a set of power lines. As he increased power for the climb, he noticed the engine out/low rotor audible warning and the engine simultaneously exhibited a loss of power. He performed an autorotation to an off-airport site. During the autorotation the helicopter entered an uncommanded roll to the left. Despite his control inputs, the pilot was unable to arrest the roll and the helicopter impacted terrain in a nose-down, left-side-low attitude. The helicopter came to rest on its right side with substantial damage to the tailboom and main rotor system.

Postaccident examination of the airframe revealed the fuselage exhibited impact damage to the right side. The right skid fractured at the struts and separated from the fuselage. The bubble canopy fractured and separated from the fuselage. The tailboom exhibited a fracture and separation consistent with impact from the main rotor blades.

Postaccident examination revealed the engine remained secured to the airframe by the mounts. Manual rotation of the main engine driveshaft resulted in the rotation of the stage four turbine wheel, confirming continuity of the N2 drivetrain. Motoring the engine by the starter generator resulted in smooth rotation of the compressor rotor, confirming continuity of the N1 drivetrain. Engine control continuity was confirmed from the throttle to the fuel control unit. All engine oil and fuel lines were found secured with all B-nuts being at least hand tight and with no evidence of leakage.

A check of the pneumatic system by application of about 25 psi of air pressure at the Pc filter resulted in the detection of minor air leakage at both B-nuts on both ends of the accumulator and a large leak at the PTG to FCU Pc input line. Closer examination revealed the B-nut had no thread engagement and had slid aft down the Pc line, as shown in figure 1. The input union on the FCU exhibited evidence of green colored torque paint that was similar in color to the other B-nuts and inputs on the FCU.

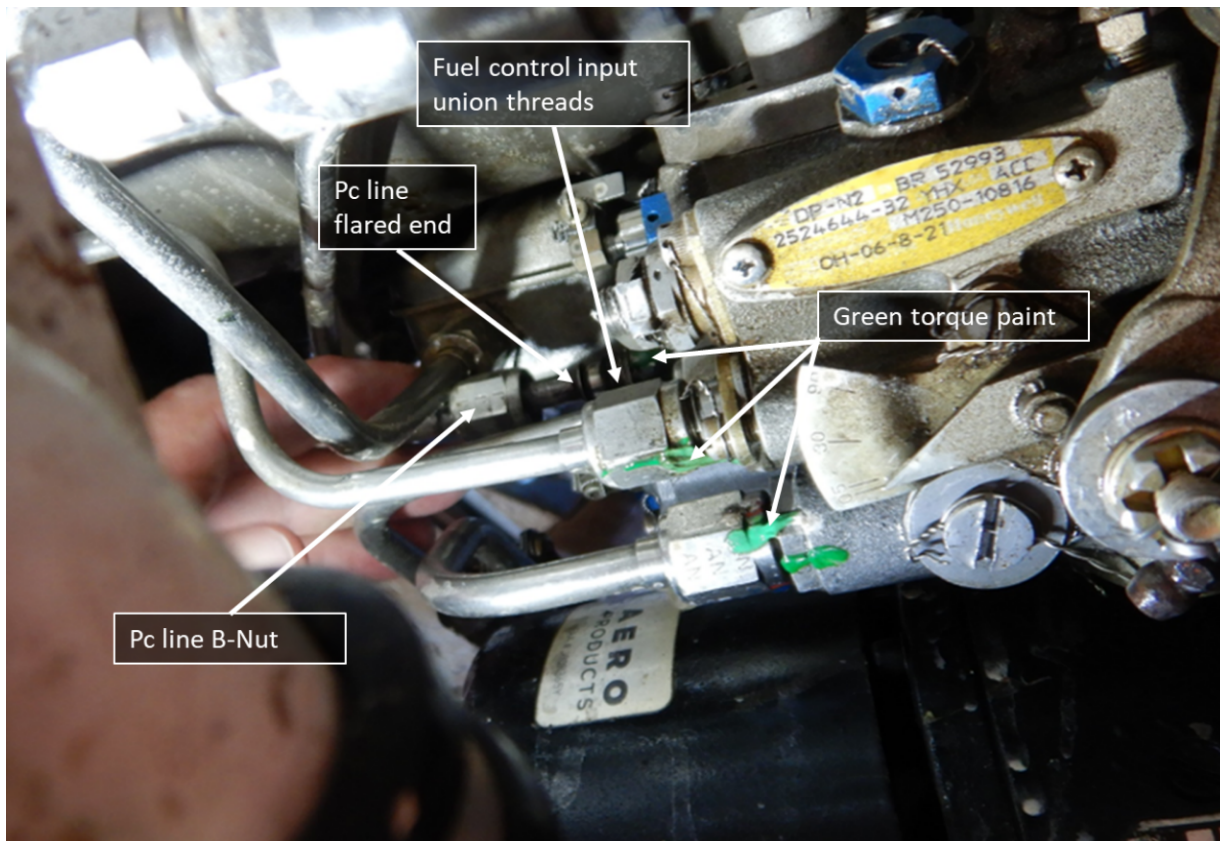


Figure 1. Image of the accident fuel control, showing the B-nut, the flared end of the Pc line, and the threads of the attachment fitting of the fuel control.

According to Rolls-Royce, the engine manufacturer, the Pc line connecting the PTG to the FCU is the third of three Pc lines in the system. Pc air is the power supply or motive force that allows the fuel control to modulate fuel delivered to the engine fuel nozzle. With this line disconnected, the engine would reduce power to an unpowered static-state or sub-idle condition.

Further examination of the fuel control, fuel governor, and fuel nozzle revealed normal operation. No other preaccident mechanical malfunctions or failures with the engine or airframe were found that would have precluded normal operation.

According to maintenance records, on June 23, 2023, the fuel control was installed on the accident engine along with several other engine components, including the fuel pump, governor, fuel nozzle, bleed control assembly, and a tachometer generator.

On February 8, 2024, about 15 days before the accident, at a Hobbs time of 902.5, a maintenance facility completed the 150-hour/300-hour engine inspections, along with several airframe inspections. According to the Rolls-Royce Alternate Inspection Schedule, the 150/300-hour inspection states, in part, *"Inspect all B-nuts for application and alignment of torque paint. If missing, loosen the B-nut, retighten, and apply torque paint."* The Hobbs meter at the time of the accident read 931.7. The maintenance technician who signed off the work did

not recall the specifics of the annual inspection conducted on February 8, 2024, as he did several inspections during the shift, but did report the use of the checklists for each inspection.

Rolls-Royce released commercial service letter (CSL) 2373 that addressed a special tool to access the subject B-nut. The CSL provides details on how to manufacture the tool locally and the tool is also available for purchase.

Pilot Information

Certificate:	Commercial	Age:	63,Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	4-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	
Instructor Rating(s):	Helicopter	Toxicology Performed:	
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	April 13, 2023
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	April 2, 2022
Flight Time:	15000 hours (Total, all aircraft), 15000 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N2618W
Model/Series:	47G-3B-1	Aircraft Category:	Helicopter
Year of Manufacture:	1966	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	6580
Landing Gear Type:	Skid	Seats:	2
Date/Type of Last Inspection:	February 8, 2024 Annual	Certified Max Gross Wt.:	2950 lbs
Time Since Last Inspection:		Engines:	1 Turbo shaft
Airframe Total Time:	12450.7 Hrs	Engine Manufacturer:	Rolls-Royce
ELT:	Not installed	Engine Model/Series:	250 SERIES
Registered Owner:	ENGLISH AIR SERVICE LLC	Rated Power:	420 Horsepower
Operator:	ENGLISH AIR SERVICE LLC	Operating Certificate(s) Held:	Agricultural aircraft (137)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KSMX, 243 ft msl	Distance from Accident Site:	6 Nautical Miles
Observation Time:	07:51 Local	Direction from Accident Site:	272°
Lowest Cloud Condition:		Visibility	9 miles
Lowest Ceiling:	Broken / 20000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	None / None
Wind Direction:		Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.08 inches Hg	Temperature/Dew Point:	8°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Santa Maria, CA (SMX)	Type of Flight Plan Filed:	Company VFR
Destination:	Santa Maria, CA (SMX)	Type of Clearance:	None
Departure Time:	06:45 Local	Type of Airspace:	Class D

Airport Information

Airport:	Santa Maria SMX	Runway Surface Type:	
Airport Elevation:	261 ft msl	Runway Surface Condition:	Vegetation
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	34.894958,-120.32216(est)

Administrative Information

Investigator In Charge (IIC):	Salazar, Fabian
Additional Participating Persons:	David Riser; Rolls-Royce; Indianapolis, IN Jerry Dees; Federal Aviation Administration; Van Nuys, CA
Original Publish Date:	July 23, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=193831

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