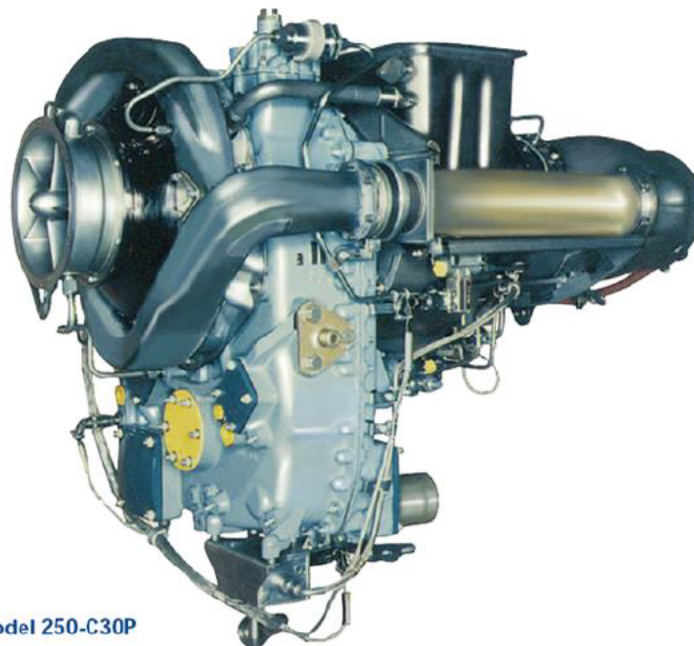




Engine Exam Field Notes

Rolls-Royce Model: 250-C30P
Engine Serial Number: CAE 890845
Aircraft Model: B206L3
Registration Number: N65PJ
Owner: PJ Helicopters
Accident Date: 2 June 2020
Wreckage Exam Date: 11 May 2021



Model 250-C30P



Jon-Adam Michael
Air Safety Investigator
Rolls-Royce

Background Information:

Per the NTSB Preliminary Report: On June 2, 2020, at 1327 Pacific daylight time, a Bell 206L3 Helicopter, N65PJ, was destroyed when it was involved in an accident near Fairfield, California. The pilot and 2 passengers were fatally injured.

The helicopter was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 133, rotorcraft external load (Human External Cargo (HEC)) operation.

Rolls-Royce participated in a wreckage examination under the direction of the NTSB IIC at Plain Parts Recovery Facility on 11 May 2021. Others present were representatives from the FAA, Bell Helicopter, and PJ Helicopters.

Wreckage Examination Observations:

The wreckage was placed on the ground in the hangar and stabilized by a metal frame as it was severely compromised during the event. The engine and main rotor / transmission were separated from the main wreckage. The separation of the engine prevented engine control continuity checks to the Fuel Control Unit (FCU) and Power Turbine Governor (PTG).

The aircraft mounted oil reservoir was split open and the oil scavenge filter was intact. The pending bypass button on the filter assembly was not extended. The filter element displayed no metallic debris but the oil had a sludge-like appearance with some carbon sooting noted. The engine mounted pressure oil filter was normal in appearance and the bowl retained residual oil. Neither the upper nor lower magnetic chip detectors displayed ferrous material.

The Outer Combustion Case (OCC), compressor discharge tubes, and numerous external lines and accessories displayed battering and various levels of impact damage. The output shaft connecting the engine to the aircraft transmission was broken and separated from the freewheeling unit, which remained attached to the gearbox. The compressor impeller was undamaged and displayed dirt ingestion. The fourth stage turbine wheel was normal in appearance when viewed from the exhaust collector.

The extensive impact damage to the engine precluded a meaningful security check of the external lines, many of which were fractured and distorted. Neither the N1 nor the N2 rotor could be turned.

The fuel pump body was fractured at the mount location and separated from the gearbox while the PTG was split in half with the drive body remaining on the gearbox. The fuel nozzle was observed while installed in the combustion liner and dirt / carbon was present on the air shroud and inner surface of the liner. The nozzle primary and secondary orifices did not appear to be blocked. The aircraft mounted fuel filter was inspected with no contaminants noted.

Engine Information:

A Rolls-Royce M250-C30P gas turbine engine, S/N CAE 890845, powered the helicopter.

Component	Serial Number	Part Number
Engine	CAE 890845	23004545
Gearbox	CAG 90835	23053349
Compressor	CAC 91927	23033193
Turbine	CAT 95329	23035128
FCU	330842	23087146
PTG	23602	23065125
Fuel Pump	T200376	6896822
Fuel Nozzle ¹	AG53188	M250-10604
Bleed Valve	FF372214	23073353

Summary of Findings:

No evidence of pre-impact mechanical damage was noted within the engine. The sand ingested into the engine up to the combustion liner suggests engine operation at impact.

¹ Fuel Nozzle information from logbooks.