

SERIOUS INCIDENT

Aircraft Type and Registration:	Airbus Helicopters AS 350, VP-CIH
No & Type of Engines:	1 Lycoming LTS101-600A-3A
Year of Manufacture:	1981 (Serial no: 1411)
Date & Time (UTC):	30 August 2018 at 1540 hrs
Location:	Owen Roberts International Airport, Grand Cayman
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 1 Passengers - 4
Injuries:	Crew - None Passengers - None
Nature of Damage:	Tail rotor gearbox actuating rod failure
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	Not known
Commander's Flying Experience:	19,000 hours (of which 10,000 were on type) Last 90 days - 34 hours Last 28 days - 11 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The AS 350 helicopter suffered tail rotor control problems in flight due to a rupture of the tail rotor gearbox (TGB) actuating rod. The pilot carried out a successful run-on landing. On 20 March 2019 the EASA issued Airworthiness Directive 2019-0060, mandating an inspection of TGB actuation rods to check for cracks.

History of the flight

The helicopter was carrying out a 20-minute sightseeing tour of Grand Cayman with the pilot and four passengers on board. Whilst descending through 500 ft and turning onto final approach for George Town Aerodrome, the pilot felt that the tail rotor pedals were not producing the correct yaw response, so he aborted the approach and informed ATC he would be returning to Owen Roberts International Airport. On the approach to the latter he tested the directional control, which did not respond correctly, so he informed ATC that he planned to conduct a run-on landing and requested fire service attendance. On assessing the condition of the grass surface, he decided it was too soft to achieve a safe run-on landing and so he flew another circuit, followed by a run-on landing on Runway 26. This was carried out successfully and at the end of the run the pilot exited to the left onto the grass to clear the runway for following traffic. All occupants disembarked without injury.

Aircraft/component examination

During examination of the helicopter it was found that the TGB actuating rod (part number 350A27191003) had ruptured at the aft end (Figure 1). No other damage was evident from the in-depth inspections of the airframe and flight controls requested by the helicopter manufacturer. The manufacturer reported that this was the first such event on the AS 350 that they were aware of.



Figure 1

Photo showing rupture at aft end of TGB actuating rod

The failed component was forwarded to the manufacturer, where a defect investigation was carried out under the supervision of an investigator from the Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile (BEA).

It was established that the rupture of the TGB actuating rod was associated with the uncoupling of the steel sleeve inside the external aluminium alloy tube. An anomaly in the internal structure of the material of the rod was identified, along with the presence of cracks in a cold worked area. The same TGB actuating rod is used on AS 355 helicopters.

Safety action

As a result of these findings, on 20 March 2019 the EASA issued Airworthiness Directive 2019-0060, mandating dye penetrant crack checks of TGB actuating rods on affected AS 350 and AS 355 helicopters.