National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

WPR22LA333

AIRWORTHINESS

Specialist's Factual Report

June 7, 2024

A ACCIDENT

Location: Mount Baldy, California
Date: September 4, 2022
Time: 0808 Pacific daylight time
Helicopter: Bell 407, registration N687AM

B AIRWORTHINESS SPECIALIST

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C SUMMARY

On September 4, 2022, at 0808 Pacific daylight time, a Bell 407 helicopter, N687AM, was substantially damaged when it was involved in an accident near Mount Baldy, California. The pilot was seriously injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 flight.

The helicopter was being used to shuttle water and equipment in support of a local charity event. The pilot had completed four shuttle flights and was approaching the main off-airport landing zone when the low rotor speed aural warning sounded. The pilot aborted the approach and attempted to increase power. Engine power did not recover, and the pilot performed an autorotation to a nearby road. The helicopter rolled upon landing, which resulted in substantial damage.

Postaccident examination of the wreckage found continuity of engine throttle control from the collective-mounted twist grip to the engine hydromechanical unit (HMU). However, the detent groove between for the twist grip "FLY" position was found to be worn such that, when the twist grip was moved from the FLY position toward idle, it was difficult to tactilely ascertain when the twist grip was out of the FLY detent. The scope of this report is focused primarily on the twist grip inspection requirements and maintenance of the twist grip accomplished by the operator.

D DETAILS OF THE INVESTIGATION

1.0 Twist Grip Throttle Inspection Requirements

The Bell 407 maintenance manual required recurrent inspection of the twist grip throttle during either Event No. 3 of the progressive inspection program[1] or during the airframe periodic inspection.[2] Specifically the inspection stated the following, with a reference to section DMC-407-A-76-00-00-00A-00SA-A of the 407 maintenance manual (**Figure 1**).

> 5. Examine the engine controls for condition, correct operation, and security. Examine the components as follows:
>
> **NOTE**
>
> Refer to DMC-407-A-76-04-00-00A-276B-A or DMC-407-A-76-04-00-00A-276A-A, "Throttle/Fly Detent Rigging Procedure" for acceptable limits.
>
> 5.1. HydroMechanical Unit (HMU) "MINIMUM" and "MAXIMUM" stops for contact during full travel of the throttle.
>
> 5.2. Linkage for any looseness.

Figure 1. The twist grip throttle inspection task within Event No. 3.

Section DMC-407-A-76-04-00-00A-276A-A and DMC-407-A-76-04-00-00A-276B-A, which are referenced in the note for throttle/FLY detent rigging, contain procedures to perform rigging of the twist grip throttle to the HMU lever. These procedures contain references to section DMC-407-A-76-04-00-00A-280A-A for throttle/fly detent friction check procedures (**Attachment 1**) and to section DMC-407-A-76-04-00-00A-271A-A for throttle/fly detent friction adjustment procedures (**Attachment 2**). Specifically, the rigging procedures state that, once the rigged configuration is obtained, that the detent friction check and detent friction adjustment procedures may be required. The throttle/Fly detent friction check procedures requires that, in order to move the throttle's ball plunger in and out of the detent groove, a value of 14 to 15 pounds is required when the plunger is pulled through the detent.

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[1] The Bell 407 progressive inspection program is split into six Events at an interval of 50-hours between each Event. After Event No. 6 is completed, the cycle began again with Event No. 1 Additionally, the progressive inspection program required an operator to, at a minimum, complete one full cycle (all six Events) within a 12-month calendar period. If one full cycle was not completed within a 12-month period, the remaining Events were to be completed prior to operating the helicopter.

[2] The Bell 407 airframe periodic inspection program is at a 12 calendar month or a 300-hour interval, whichever occurs first. The scope of the airframe periodic inspection program is to accomplish all six progressive inspection Events at once.

2.0 Twist Grip Throttle Inspection on N687AM

According to the accident helicopter records, the last Event No. 3 inspection was accomplished by the operator on May 10, 2022 at an aircraft total time (ATT) of 6873.8 hours. The operator's checklist for the Event No. 3 inspection showed the two twist grip throttle inspection tasks, as seen in the 407 maintenance manual (see **Figure 1**), were initialed by an inspector. **Attachment 3** of this report contains the last Event No. 3 inspection checklist and the aircraft logbook entry for that inspection. No anomalous findings were noted in either the inspection checklist or in the aircraft logbook for the last Event No. 3 inspection. According to the last completed aircraft logbook entry, dated September 1, 2022, the ATT at that time was about 6,942.8 hours. **Attachment 4** of this report contains the aircraft logbook entry from September 1, 2022.

E LIST OF ATTACHMENTS

Attachment 1 – Bell 407 Maintenance Manual Section DMC-407-A-76-04-00-00A-280A-A, "Throttle/Fly Detent Friction Check"

Attachment 2 – Bell 407 Maintenance Manual Section DMC-407-A-76-04-00-00A-271A-A, "Throttle/Fly Detent Friction Adjustment"

Attachment 3 – N687AM Event No. 3 Inspection Checklist and Aircraft Logbook Entry, dated May 10, 2022

Attachment 4 – N687AM Last Aircraft Logbook Entry

Submitted by:

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