Australian Government
Australian Transport Safety Bureau

Collision with terrain involving Robinson R22, VH-RGY

Richmond Airport, Queensland, 21 March 2016

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Addendum

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What happened

On 21 March 2016, at about 1200 Eastern Standard Time (EST), the pilot of a Robinson R22 helicopter, registered VH-RGY, prepared to conduct a private ferry flight from Richmond Airport to Bow Park Station, Queensland. The pilot was the only person on board. The helicopter had been parked at the airport for 12 days, with the doors on.

As the pilot rolled the throttle on to start the helicopter's engine, the pilot discovered the adhesive holding the foam cover of the throttle twist grip had deteriorated and become like grease (Figure 1). The pilot then slid the cover forwards on the collective[1] control to grip the steel column.

Figure 1: Cockpit of VH-RGY

Source: Pilot

After starting the engine, the driver of the vehicle that had taken the pilot to the airport radioed to tell the pilot that the pilot's drink bottle was still in the vehicle, and that they would meet the pilot with the drink bottle at the airport exclusion fence.

The pilot reported that they looped the bungee cord fitted to the helicopter over the collective control. The pilot then exited the helicopter, leaving the engine running and the rotor blades turning, and walked about 4 m to the fence. Within about 30 seconds, the pilot heard the

[1] A primary helicopter flight control that simultaneously affects the pitch of all blades of a lifting rotor. Collective input is the main control for vertical velocity. The collective control of the Robinson R22 incorporates a throttle mechanism designed to increase engine revolutions per minute (RPM) automatically as collective is applied.

helicopter engine RPM increase, and turned and ran back towards the helicopter. The pilot and driver then observed the helicopter rotate away from the direction of the pilot, lift up, into and over the fence and land on its side on the other side of the fence, damaging the fence.

The helicopter sustained substantial damage (Figure 2). The pilot, who was outside of the helicopter was uninjured.

Figure 2: Damage to VH-RGY (after removal from accident site)

Source: Queensland Police Service

Pilot comments

The pilot reported that they had not had any issues with the adhesive before, despite operating in temperatures over 40 °C, but they did not usually have the doors on. However, even though the temperature was about 35 □C on the day of the accident, the helicopter had been parked for 12 days with the doors on, and the temperature inside the cabin was much hotter. Additionally, there had been rain during the period the helicopter was parked at the airport, increasing the humidity inside the cabin. The pilot believed that the temperature (and possibly combined with high humidity) inside the helicopter must have exceeded the adhesive's limit. The pilot was unsure whether the adhesive, which had been applied during a rebuild of the helicopter about two years earlier, was the approved adhesive for the grip.

The pilot assessed that because the grip had slid forwards on the collective control, the bungee cord may not have been far enough over the steel column, and it then slid further forwards, allowing the collective to rise, and the helicopter then lifted off.

Adhesive for grip

The R22 Illustrated Parts Catalogue specified Part Number B270-15 Adhesive to be used to install the grip. The specified adhesive was clear, and was manufactured by 3M, with part number 2262. According to the Technical Data for 3M Plastic Adhesive 2262, when the adhesive was tested for 'plus 7 days' at 140 °F (60 °C), it failed 'in adhesion to the indicated substrate (steel)'.

Given the helicopter was parked for over 7 days, with doors on and in hot and humid conditions, this testing suggests that if the approved adhesive was used on the collective grip, it was likely to fail.

Helicopter manufacturer comments

A representative from Robinson Helicopter Company (RHC) advised that the bungee cord was not an RHC installation, nor part of the type design. The post-accident photo (Figure 1) shows that the collective friction knob was in the OFF position, which indicates that the pilot had not applied it. (When tightened to the 'locked' position, the collective friction knob is designed to prevent the collective from moving from the position it was locked in.) However, they emphasised that the safest way to prevent similar incidents is to never leave the flight controls unattended while the engine is running.

They had received no other reports of similar events with the grip adhesive. They also commented that a thorough pre-flight check would likely alert the pilot to any issue with the collective grip.

Safety message

Pre-flight checks are designed to ensure the helicopter is capable of operating correctly. To ensure safety of flight, any discovery of an unservicability should be dealt with before flight.

Leaving any vehicle unattended with the engine running carries considerable risk. The Normal Procedures in the R22 Pilot's Operating Handbook (POH) includes the caution: 'Never leave helicopter flight controls unattended while engine is running.' The POH also includes a number of important safety tips and notices. One safety notice with relevance to this accident is Safety Notice 17, which includes the following text:

> NEVER EXIT HELICOPTER WITH ENGINE RUNNING
>
> Several accidents have occurred when pilots momentarily left their helicopters unattended with the engine running and rotors turning. The collective can creep up, increasing both pitch and throttle, allowing the helicopter to lift off or roll out of control.

General details

Occurrence details

Date and time:	21 March 2016 – 1500 EST	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	Richmond Airport, Queensland	
	Latitude: 20° 42.12' S	Longitude: 143° 06.88' E

Helicopter details

Manufacturer and model:	Robinson Helicopter Company R22 Beta	
Registration:	VH-RGY	
Serial number:	1445	
Type of operation:	Private – Test & Ferry	
Persons on board:	Crew – 0	Passengers – 0
Injuries:	Crew – 0	Passengers – 0
Aircraft damage:	Substantial	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in:

independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to operations involving the travelling public.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.