Australian Government
Australian Transport Safety Bureau

Collision with terrain involving a Robinson R22, VH-RBO

near Daly Waters (ALA), Northern Territory, on 28 June 2015

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Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

Addendum

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Collision with terrain involving a Robinson R22, VH-RBO

What happened

On 28 June 2015, at about 1500 Central Standard Time (CST), a Robinson R22 helicopter, registered VH-RBO, took off from a property near Daly Waters, Northern Territory, for a local flight, including inspection of bores on the property. The temperature was about 30°C with a south-easterly wind at 10-15 kt. After flying for about 20 minutes, the pilot, who was the sole occupant of the helicopter, landed to open a gate and put out a bucket of chain. The pilot selected the governor off, then exited the helicopter, leaving the engine running. The pilot then re-boarded the helicopter and took off.

After a further 5 to 10 minutes of flight, when at about 100 ft above ground level, and an airspeed of 40 kt, the pilot conducted a turn to the south. The low rotor revolutions per minute (RPM) warning horn sounded. The pilot immediately wound the throttle fully open, and lowered the collective[1] to try to regain rotor RPM. The helicopter continued to descend. The pilot attempted to flare[2] the helicopter when low to the ground. The main rotor blades collided with tree branches. The helicopter landed heavily, the skids dug in to the soil and the helicopter rolled onto its side.

The pilot sustained minor injuries and the helicopter was substantially damaged (Figure 1).

Figure 1: Accident site

Source: Aircraft engineer

Pilot comments

The pilot was unsure whether the engine was running normally when the helicopter touched down, and could only recall hearing the rotor RPM warning horn. The pilot was focused on looking outside the helicopter at an earth tank and a mob of cattle and not inside at the instruments. The pilot reported that it was their normal procedure to switch off the governor when exiting, and then select it back on when returning to the helicopter. However, on this occasion, the pilot could not recall specifically switching it back on.

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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.

2 Final nose-up pitch of landing aircraft to reduce rate of descent to approximately zero at touchdown.

Engineering report

A 100-hourly maintenance inspection and the replacement of two cylinders was completed on the morning of the accident flight. The pilot and an engineer then conducted a flight of about 20 minutes duration, during which the helicopter performance and all indications were normal.

An initial inspection of the helicopter following the accident found the following:

- No oil on the exterior of the engine or helicopter to indicate any oil line failure.
- Fresh oil droplets on the right skid and a smear on the right strut. Immediately adjacent to the helicopter there was a small oil spill on the ground, probably from impact damage.
- The fuel tanks still contained a substantial amount of fuel, which was leaking out down the mast.
- Fuel from the drum was checked with no contamination found. The helicopter was fuelled with premium unleaded petrol.
- Icing was found to have been unlikely.
- Drive belts were still on and intact.
- Clutch engagement position appeared normal.
- Main rotor blades were buckled and damaged, partly from falling onto a fence, but were still attached to the hub.
- Main rotor blades were evidently not turning fast when they hit the ground.
- The engine was running on impact.
- The governor switch was in the OFF position. The engineer turned on the master switch, and the governor light (GOV OFF) illuminated.

The engineer removed the main rotor blades and rolled the helicopter upright. The bottom spark plugs were removed and cleaned of oil, and then replaced. The engineer then started the engine and a positive oil pressure indicated. The engine was ground run for about 30 seconds and the magnetos, temperatures and pressure indicated normally.

Safety message

The Robinson Helicopter Company Safety Notice SN-24 states that rotor stall due to low RPM causes a very high percentage of helicopter accidents. These mostly occur close to the ground during take-off and landing. Safety Notice SN-10 reminds pilots to have their ‘reflexes conditioned so they will instantly add throttle and lower collective to maintain RPM in an emergency’.

General details

Occurrence details

Date and time:	28 June 2015 – 1600 CST	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	near Daly Waters (ALA), Northern Territory	
	Latitude: 16° 16.00' S	Longitude: 133° 22.00' E

Helicopter details

Manufacturer and model:	Robinson Helicopter Company R22 Beta	
Registration:	VH-RBO	
Serial number:	0810	
Type of operation:	Aerial work	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – 1 Minor	Passengers – Nil
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 fare-paying passenger operations.

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.