



Australian Government

Australian Transport Safety Bureau

Wheels up landing involving Beech 58, VH-UZO

Gove airport, Northern Territory, 8 August 2016

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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

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Addendum

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Wheels up landing involving Beech 58, VH-UZO

What happened

On 8 August 2016, at about 0700 Central Standard Time (CST), a Beech 58 aircraft, registered VH-UZO (UZO), departed Gove Airport, Northern Territory, for a flight to Elcho Island Airport, Northern Territory. On board were a pilot and four passengers.

During the initial climb, the pilot selected the landing gear up and noted the landing gear motor stopped after a shorter time interval than expected. At this time, the passengers reported hearing a crunching sound. The pilot observed that the landing gear unsafe light remained illuminated after the landing gear motor stopped.

Rather than continue the flight to Elcho Island, the pilot returned the aircraft to hold overhead Gove Airport while they attempted to ascertain the reason for the landing gear malfunction. The pilot noted that the circuit breaker for the landing gear had tripped, so reset the circuit breaker and selected the landing gear down. The landing gear unsafe light remained illuminated and the circuit breaker tripped again. The pilot then contacted the aerodrome reporting officer (ARO) and requested a visual confirmation of the position of the landing gear. The ARO reported that all landing gear appeared to be fully retracted.

Given that normal landing gear extension had been unsuccessful, the pilot elected to conduct an emergency landing gear extension. The Beech 58 emergency landing gear extension requires the pilot to engage a handle into the landing gear gearbox positioned behind the front seats. The handle is then turned counter clockwise to manually lower the landing gear. Fully extending the landing gear takes about 50 turns of the handle.

The pilot held the aircraft to the north of Gove Airport and engaged the autopilot while they conducted the emergency landing gear extension procedure. The pilot reported that no resistance was felt through the extension handle when attempting the landing gear extension, the handle felt like it was not connected. The pilot then flew back overhead Gove Airport for the ARO to again report on the position of the landing gear. The ARO reported that the landing gear remained retracted. The pilot then resumed holding, and calculated that they had sufficient fuel to continue to hold for a further two hours and 15 minutes. While holding, the pilot contacted the company chief pilot and engineer to assist with further troubleshooting the malfunction. The engineer examined the aircraft wiring diagram and another Beech 58 parked at the airport. The engineer then described several methods to isolate various parts of the electrical system to identify any problem which prevented the landing gear from extending. Over the next two hours, the pilot tried these methods along with multiple attempts of the emergency landing gear extension procedure. Despite the pilot's attempts, the landing gear remained retracted.

At about 0930, the pilot prepared for a wheels up landing. They briefed the passengers on the use of seatbelts, bracing position, emergency exit locations and actions to be taken after the landing. The ARO arranged for the emergency services to be in attendance. The pilot discussed with the chief pilot whether to land on the runway or adjacent dirt. As the runway provided a hard, smooth surface of known condition, the pilot elected to land on the runway. The chief pilot then briefed the emergency services on the intended actions of the pilot. The pilot reviewed the wheels up landing procedure in the pilot operating handbook (POH), and elected to conduct a flaps up landing to minimise damage.

At about 0945, the aircraft approached the runway. Just before the aircraft touched down, the pilot shut the engines down in accordance with the POH wheels up landing procedure. As the aircraft slid along the runway, smoke filled the cabin and the pilot selected the fuel off. Once the aircraft

came to a stop (Figure 1), the occupants immediately exited the aircraft. The pilot directed the passengers to a safe location behind the aircraft.

No persons were injured and the aircraft was substantially damaged in the accident.

Figure 1: VH-UZO after the wheels up landing



Source: Pilot

Pilot comments

The pilot of VH-UZO provided the following comments:

- To assist in troubleshooting the malfunction, multiple videos of the actions taken by the pilot and indications presented by the aircraft systems were sent to the engineer.
- The passengers were engaged to assist in the attempts to lower the landing gear. The passenger in the seat next to the pilot held the POH. Other passengers also attempted to wind the emergency landing gear handle.
- The passengers were directed to evacuate to the rear of the aircraft. The pilot has subsequently learned that the safer option is to direct passengers to the side of the aircraft and upwind, away from fuel vapours.

Engineering report

A post-accident examination of the landing gear system found that the gear box shaft bearing had fractured. This bearing secures and aligns the shaft worm drive, which attaches both the emergency handle mechanism and the electric motor to the gear box. Failure of the bearing allowed the shaft worm drive to disconnect from the gearing. The drive became jammed, causing further damage to the gear box. Damage to the gear box prevented normal operation and caused the electric motor to overload and trip the circuit breaker. The bearing failure also prevented the emergency handle from connecting to the gear box.

Safety message

Even though the operation was conducted single-pilot, this accident provides a good example of effective crew resource management techniques. The pilot quickly established that the available fuel endurance allowed ample time to carefully consider the circumstances and attempt to resolve the issue. They engaged company personnel, using multiple means, to provide as much information as possible and attempt to identify a solution to the malfunction and sought the assistance of the ARO to inspect the aircraft and to alert emergency services. Holding over an easily identifiable position, and using the passengers where appropriate to assist with management of the emergency, also reduced pilot workload. The pilot also prepared the

passengers for the wheels up landing, this minimised the risk of injury and ensured the evacuation was controlled and orderly.

General details

Occurrence details

Date and time:	8 August 2016 – 0945 CST	
Occurrence category:	Accident	
Primary occurrence type:	Landing gear / Indication	
Location:	Gove Airport, Northern Territory	
	Latitude: 12° 16.170' S	Longitude: 136° 49.100' E

Aircraft details

Manufacturer and model:	Beech Aircraft Corporation 58	
Registration:	VH-UZO	
Serial number:	TH-586	
Type of operation:	Charter - Passenger	
Persons on board:	Crew – 1	Passengers – 4
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.