Australian Government
Australian Transport Safety Bureau

Incorrect configuration involving Beechcraft A36, VH-YEN

Camden Airport, New South Wales, 12 November 2013

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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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Incorrect configuration involving Beech A36, VH-YEN

What happened

On 12 November 2013, a flight instructor and student pilot were conducting flying training in a Beech A36 (Bonanza) aircraft, registered VH-YEN, at Camden Airport, New South Wales. The purpose of the flight was to enable the student to obtain an aircraft design feature, retractable undercarriage (landing gear) endorsement.

After completing a pre-flight briefing, the instructor conducted a pre-flight inspection with the student, who was new to the aircraft type.

VH-YEN damage

Source: NSW Police

Soon after, the flight departed for the training area to complete the upper air training section of the endorsement. For about 40-45 minutes, the instructor worked with the student to complete a range of flight activities. This included conducting stalls[1] in various configurations; operating at different engine power settings with varying combinations of landing gear and flap selections, steep turns, the manual landing gear extension procedure and practice forced landings. Throughout the exercise, the student operated both the flap and landing gear levers (Figure 1), including a go-around from a practice forced landing.

On returning to Camden, the crew received an air traffic clearance to conduct a straight in approach and a touch-and-go on runway 06.

During the approach, the student completed the pre-landing checks, which included extending the landing gear and flaps. The instructor reported the student flew a well-controlled approach, although he inadvertently selected full (‘down’) flap instead of ‘approach’ flap as instructed.

At about 1445 Eastern Daylight-saving Time (EDT),[2] the aircraft touched down about 50-100 m past the runway 06 threshold and about 2 m left of the centreline. The instructor advised the student to re-align the aircraft with the runway centreline. The instructor then looked outside the cockpit at the aircraft’s position while the student corrected the alignment.

Shortly after, when the aircraft was about 200-300 m along the runway, the student became concerned about the length of runway remaining, and quickly moved to retract the flaps and prepare the aircraft for the take-off. However, the student inadvertently reached for the landing gear lever and retracted the landing gear.

The instructor heard the landing gear warning horn activate, quickly assessed the situation, and selected the lever to extend the gear again. As he felt the aircraft sink toward the runway, he applied full engine power in an attempt to keep it flying long enough for the landing gear to fully extend.

With the left main gear almost extended, the aircraft began to veer to the right. The instructor noted that there were buildings in the path of the aircraft and elected to reject the take-off. When the aircraft had slowed to about 30-40 kt, the nose dug into the grass alongside the runway.

The instructor and student were not injured, but the aircraft sustained substantial damage.

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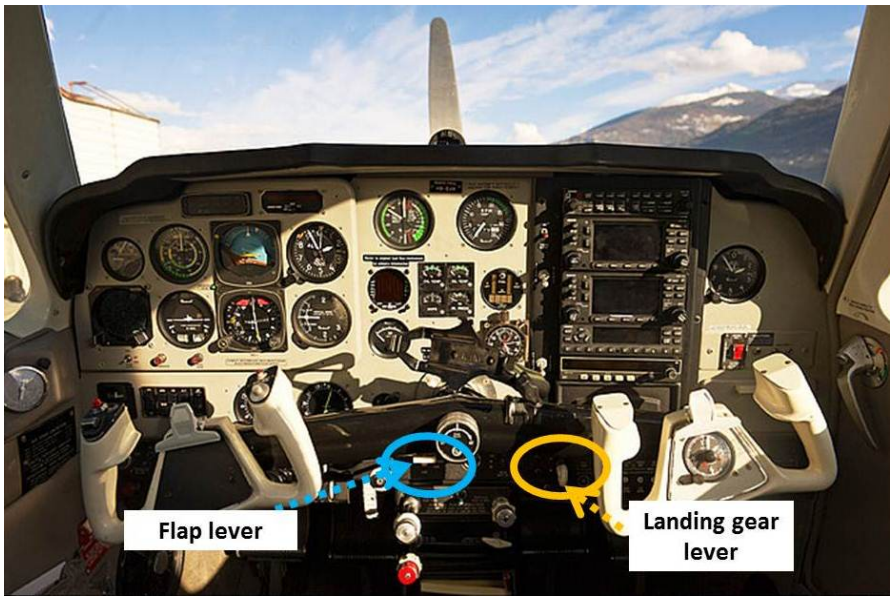
1 Term used when a wing is no longer producing enough lift to support an aircraft’s weight.

2 Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

The student had completed his recent training in a Cessna 182 aircraft, which had the flap lever located in a position similar to that of the landing gear lever in the Bonanza (Figure 1 and Figure 2).

Figure 1: Cockpit of a Beech Bonanza similar to VH-YEN



Source: Daniel Adler

Figure 2: A Cessna 182 cockpit

Source: Boran Pivcic

Student pilot comments

The student was soon to undertake his Commercial Pilot's (Aeroplane) Licence flight test. He commented that, in hindsight, it may have been prudent to complete the test prior to starting the retractable landing gear endorsement.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Aircraft operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they have changed their procedure for retractable landing gear design type endorsements

Instructors at the flying school undertaking retractable landing gear design type endorsement training with students are now required to conduct a full stop landing on the first approach.

ATSB Comment

In most retractable aircraft, the landing gear selector is intentionally wheel-shaped, to assist the pilot to identify this control from others in the cockpit. The flap lever is likewise shaped like an aerofoil, to represent a wing/flap system.

These designs add a level of redundancy against inadvertent retraction of the landing gear.

The AOPA Air Safety Foundation's publication *Beechcraft Bonanza/Debonair Safety Highlights* recommends "using extreme caution" when operating the flap switch while on the ground, for the pre 1984 Beech models: The report is available at:

www.aopa.org/-/media/Files/AOPA/Home/Pilot%20Resources/ASI/safety%20highlights/beech_bonanza.pdfSafety%20message

Research on human skill development has provided insight on why pilots make errors related to habit. As pilots progress in flying skills, many of the physical activities within flying can become routine and automatic. This can cause some pilots to make control inputs "by habit' in certain situations.[3]

The inadvertent retraction of the landing gear by pilots flying a range of aircraft types or unfamiliar with the earlier models of this type of aircraft has appeared in aircraft accident reports over many years.

In a 1980 report[4] published by the United States (US) National Transportation Safety Board (NTSB), the Beech Bonanza and the twin-engine Beech Baron were involved in the majority of inadvertent landing gear retraction accidents between 1975 and 1978. At that time, the Bonanza model accounted for about 30 per cent of the active light single-engine retractable landing gear aircraft fleet, however, they were involved in 67 per cent of landing gear retraction accidents. The report included a directive to manufacture all new aircraft of this type with the landing gear and flap controls in the same, relative location, that is, the landing gear lever to the left and the flap lever to the right of the engine controls. For aircraft that were unable to conform to this, a guard or latch mechanism to prevent inadvertent activation of the landing gear controls was required.

This was also highlighted in a 2001 report[5] produced by the US Aircraft Owners and Pilots Association (AOPA), which stated that the early model Bonanzas had a significantly higher involvement in inadvertent landing gear retraction than other aircraft.

From 1984, the Bonanza and other Beech model aircraft were manufactured with the landing gear lever to the left of the engine power controls and the flap lever to the right.

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3 Fitts, P.M.; Posner, M.I. Human Performance. New York, United States: Academic Press 1967

4 www.ntsb.gov/doclib/recletters/1980/A80_56_58.pdf

5 www.aopa.org/-/media/Files/AOPA/Home/Pilot%20Resources/ASI/safety%20highlights/beech_bonanza.pdf

General details

Occurrence details

Date and time:	12 November 2013 –1500 EDT	
Occurrence category:	Accident	
Primary occurrence type:	Incorrect configuration	
Location:	Camden Airport, New South Wales	
	Latitude: 34° 02.42' S	Longitude: 150° 41.23' E

Aircraft details

Manufacturer and model:	Beechcraft Aircraft Corporation A36	
Registration:	VH-YEN	
Serial number:	E-1731	
Type of operation:	Flying training - dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	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.