



**Australian Government**

**Australian Transport Safety Bureau**

# Trim system malfunction involving a Fairchild SA227, VH-UZI

Rockhampton Airport, Queensland, 6 August 2014

**ATSB Transport Safety Report**  
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#### **Addendum**

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# Trim system malfunction involving a Fairchild SA227, VH-UZI

## What happened

On 6 August 2014, at about 0500 Eastern Standard Time (EST), the pilot of a Fairchild SA227 aircraft, registered VH-UZI, conducted a pre-flight inspection and weight and balance calculations for a freight charter flight from Rockhampton to Townsville, Queensland. The freight was loaded with a forward centre of gravity, but well within the allowable envelope. The pilot set the trim in the cockpit at a nose-up trim position.

During the take-off run, the pilot reported all indications and performance were normal passing 70 knots. Passing  $V_1$ ,<sup>1</sup> as the pilot increased the back pressure on the control yoke to rotate the aircraft for take-off, the control column felt heavy and the aircraft nose wheel did not lift off the ground. The pilot continued to increase the back trim and back pressure on the control yoke and the 'out of trim' warning sounded. The pilot rejected the take-off, applied maximum braking and reverse thrust. The aircraft decelerated to a slow taxi speed with about 600 m of runway remaining.

After taxiing the aircraft back to the bay, the pilot requested the freight be re-weighed. The pilot then recalculated the aircraft weight and balance with the actual freight distribution and found the centre of gravity slightly more forward than the original load sheet position.

The pilot set the stabiliser trim gauge in the cockpit to read a nose up attitude, and then externally inspected the position of the stabiliser. He observed the stabiliser in a neutral position and therefore determined that the gauge did not accurately indicate the stabiliser position (Figure 1). The pilot assessed that the combination of the incorrectly loaded freight causing a forward centre of gravity and the inaccurate stabiliser trim gauge led to the out of trim warning and overly heavy control pressure required for the attempted take-off.

**Figure 1: Cockpit indication with horizontal stabiliser in the neutral (take-off) position**



Source: Operator

<sup>1</sup>  $V_1$  is the critical engine failure speed or decision speed. Engine failure below this speed shall result in a rejected take-off; above this speed the take-off run should be continued.

### **Engineering inspection**

An engineering inspection found that the actual position of the horizontal stabiliser was not being correctly displayed on the pitch trim indicator in the cockpit. The engineer then calibrated the system and returned the aircraft to service. During a fleet-wide check the following day, it was found that the pitch trim system on UZI was not being consistently displayed with accuracy on the cockpit indicator. The potentiometer in UZI was replaced which resolved the fault.

### **Freight reconciliation**

Overall, the actual freight loaded weighed about 30 kg more than that stated on the load plan. One of the aircraft's freight 'zones' was loaded with 72 kg more than the placard maximum weight for that zone. A revised trim sheet was prepared using the re-weigh information and found that the aircraft was within the centre of gravity limits for the proposed flight with a centre of gravity slightly forward of the original calculated position.

## **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 are taking the following safety actions:

#### **Survival aspects**

- Investigate the length of the runway used and the possibility of a runway overrun on a shorter runway.

#### **Ground handling management**

- Investigate the management of the ground handler and the manner in which the aircraft are loaded at all ports.

#### **System calibration**

- Review the system calibration used in the initial engineering inspection.

## **Safety message**

The ATSB SafetyWatch highlights the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry. One of the safety concerns is about data input errors, [www.atsb.gov.au/safetywatch/data-input-errors.aspx](http://www.atsb.gov.au/safetywatch/data-input-errors.aspx). Data input errors, such as the incorrect loading figures being used, occur for many different reasons. The consequences of these errors can include a range of aircraft handling and performance issues.

This incident also demonstrates that by electing to use the full runway length, following standard procedures and acting immediately on receiving a warning, the pilot ensured there was sufficient distance to safely reject the take-off.



## General details

### Occurrence details

Date and time:	6 August 2014 – 0500 EST	
Occurrence category:	Incident	
Primary occurrence type:	Technical – Systems – Flight controls	
Location:	Rockhampton Airport, Queensland	
	Latitude: 23° 22.92' S	Longitude: 150° 28.52' E

### Aircraft details

Manufacturer and model:	Fairchild Industries SA227-AT	
Registration:	VH-UZI	
Serial number:	AT-570	
Type of operation:	Freight charter	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

## 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.