Australian Government
Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Investigation – AO-2008-001

Preliminary

Elevator tab failure
Pt. Moresby, PNG - 31 Dec 2007
VH-OZX
Boeing 737-229

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Postal address: PO Box 967, Civic Square ACT 2608
Office location: 15 Mort Street, Canberra City, Australian Capital Territory
Telephone: 1800 621 372; from overseas + 61 2 6274 6440
Accident and serious incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117; from overseas + 61 2 6247 3117
E-mail: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

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Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608 Australia
www.atsb.gov.au

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Abstract

After departing Port Moresby, Papua New Guinea, at 0430 Coordinated Universal Time on 31 December 2007, the flight crew of a Boeing 737-229 aircraft, registered VH-OZX, being operated on a scheduled flight from Port Moresby to Brisbane, reported severe vibration through the airframe, resulting in a Mayday broadcast and return to Port Moresby.

A subsequent examination on the ground, found a section of the right elevator balance tab had detached and was missing. Preliminary examination of the tab indicated that a failure of one of the elevator tab hinge blocks had occurred.

The investigation is continuing.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal bureau within the Australian Government Department of Infrastructure, Transport, Regional Development and Local Government. ATSB investigations are independent of regulatory, operator or other external organisations.

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.

Purpose of safety investigations

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

It is not the object of an investigation to determine blame or liability. However, 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.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to proactively initiate safety action rather than release formal recommendations. However, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation, a recommendation may be issued either during or at the end of an investigation.

The ATSB has decided that when safety recommendations are issued, they will focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on the method of corrective action. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations. It is a matter for the body to which an ATSB recommendation is directed (for example the relevant regulator in consultation with industry) to assess the costs and benefits of any particular means of addressing a safety issue.

About ATSB investigation reports: How investigation reports are organised and definitions of terms used in ATSB reports, such as safety factor, contributing safety factor and safety issue, are provided on the ATSB web site www.atsb.gov.au.

FACTUAL INFORMATION

The information contained in this preliminary report is derived from initial investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may come to light that alters the circumstances as depicted in this report.

History of the flight

After departing Port Moresby, Papua New Guinea, at 0430 UTC[1] on 31 December 2007, the flight crew of a Boeing 737-229 aircraft, registered VH-OZX, being operated on a scheduled passenger flight from Port Moresby to Brisbane, Qld, reported vibration through the airframe, while passing through 7,000 ft.

The initial vibration was light and no abnormal instrument indications were observed. At approximately 15,000 ft, after a progressive increase in intensity, the vibration became so severe that control of the aircraft became difficult. As a result, the flight crew broadcast a Mayday[2] and initiated an immediate return to Port Moresby. As the thrust levers were reduced and the aircraft commenced descent, an increase in vibration was again experienced and emergency services were requested for the arrival. At approximately 4,500 ft, the vibration stopped and the crew completed a normal landing.

A subsequent examination of the aircraft on the ground found that a section of the right elevator balance tab had detached and was missing (Figure 1).

Elevator tab

Each elevator contained a balance tab to reduce control forces when operated manually. A subsequent inspection indicated that the right elevator tab had failed with a section separating from the aircraft. The remaining sections of the elevator tab were removed and sent to the Australian Transport Safety Bureau (ATSB) for further examination.

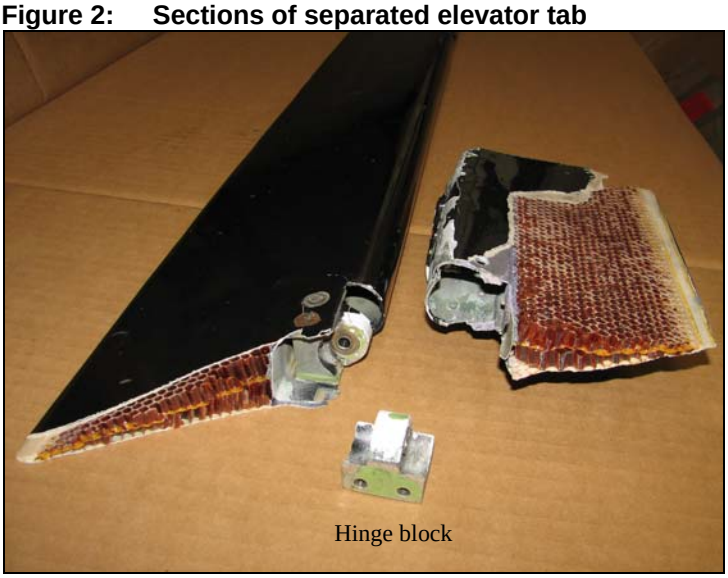
1 UTC - Coordinated Universal Time

2 International radio broadcast for urgent assistance.

Figure 1: Right elevator tab section detached

A preliminary examination indicated that the failure of one of the elevator tab hinge blocks had occurred (Figure 2).

Figure 2: Sections of separated elevator tab



The Boeing 737-200 aircraft was subject to service bulletin (SB) SB737-55A1078 issued by the aircraft manufacturer and mandated through airworthiness directives (AD) issued by the US Federal Aviation Administration (AD/2006-14-07) and the Australian Civil Aviation Safety Authority (AD/B737/292). That SB related to wear in the elevator web and tab hinge components that could lead to vibration and subsequent elevator tab failures. The aircraft operator had complied with the SB requirements, with relevant inspections having been carried out and current. Further examination of the elevator tab and hinge block is ongoing.

On-board recorded information

The aircraft was fitted with a digital flight data recorder (DFDR) and a cockpit voice recorder (CVR). Both were removed and sent to the ATSB for replay and analysis.

An examination revealed that the CVR audio contained approximately 32 minutes of conversations relating to post-incident operation of the aircraft on the ground, indicating that the audio recorded during the incident had been overwritten by continued operation of the CVR after the aircraft had landed.

The DFDR possessed a digital data stream from a flight data acquisition unit for a minimum period of 25 hours. That recording medium was extracted and data relating to the incident flight was recovered.

Preliminary analysis revealed that the quality of the recovered data provided a general overview of the flight path of the aircraft and allowed confirmation of the flight crew's report.

Further investigation

The investigation is continuing and will examine the following:

- the failure of the elevator tab
- flight crew actions and procedures
- aircraft maintenance history and procedures
- aircraft manufacturers recommended practices.