

# Safety Investigation Report

Ref. AAIU-2020-01-31-01  
Issue date: 31 January 2022  
Status: Final

## Scope: Limited

As per ICAO Annex 13 and EU regulation EU 996/2010, decisions regarding whether to conduct a civil aviation safety investigation, and the extent of an investigation, are based on many factors, including the level of safety benefit expected to be drawn from such an investigation.

For this occurrence, a limited-scope, fact-gathering investigation and analysis was conducted in order to produce a short summary report. The investigation mainly focussed on the actions and conditions directly relating to the occurrence and might not cover all aspects of the aircraft operation and/or possible underlying safety factors due to the expected safety benefit of it and/or the extent of evidence/resources available.

## SYNOPSIS

Occurrence class	Incident
Occurrence category	System/component failure or malfunction [non-powerplant] (SCF-NP)
Date and time <sup>1</sup>	31 January 2020 11:30 UTC
Location	51,235624°N - 004,437490°E
Aircraft	Partenavia P68B
Aircraft category	Fixed wing - Small aeroplane (MTOW ≤ 5700 kg)
Location of departure	Aerodrome of Antwerp/Deurne (EBAW)
Planned destination	Aerodrome of Antwerp/Deurne (EBAW)
Type of operation	Non-commercial - Cross-country
Phase of flight	Initial climb
Injuries	None
Aircraft damage	Minor

## What happened

During a local flight after maintenance, when the aircraft was climbing at 1000 ft, the emergency door fell out. The door landed at short distance of a car.

<sup>1</sup> All time data in this report are indicated in UTC, unless otherwise specified

### What the AAIU(Be) found as safety topics

Systemic	Organisational	None determined
	Technical	Development – Design – Equipment design Aircraft structure – Emergency exit – Design Aircraft structure – Emergency exit – Unintentional use/ operation
	Operational	Development – Design – Design of document/info Aircraft handling/service – Placards and markings – Not specified
	Human	Action/decision – Aircraft inspection – Emergency exit – inadequate inspection
	Environmental	None determined

## 1. FACTUAL INFORMATION

### 1.1 History of flight

The aircraft took off from EBAW after maintenance at a local Part-M Subpart F Maintenance Agency. At an altitude of 1000 ft, when initiating a left-hand turn above the reporting point PORTA towards reporting point KALLO, the emergency exit window fell out.

The pilot reported the loss to ATC and returned to EBAW.

The falling part was spotted by a woman and her son, driving around in the neighborhood. The son noticed a plane flying over, when he suddenly saw that an object fell from the plane. This object landed +/- 15m from the vehicle next to the road on a piece of wasteland (position 1 on Figure 1).

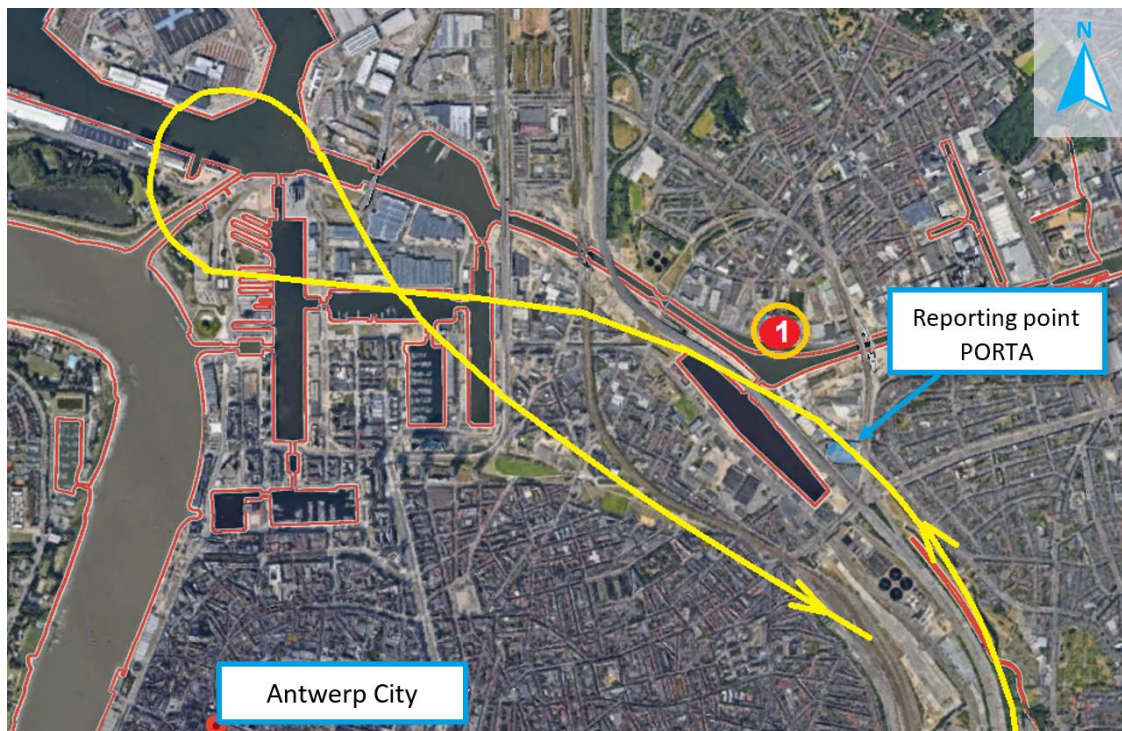


Figure 1: Flight track and position (1) of the part (© Google Earth - 2019)

When the woman and her son drove back home (in the other direction) they stopped at the place where the object fell to see what it was. They found this object and it appeared to be the emergency exit window lost by the aircraft. The woman saw an article about this incident in the media the next day and then called the airport inspection services and brought the window to the airport.

## 1.2 Injuries and damage

There was no injury to anyone.

The window was bent by the impact, but externally showed limited damage.

## 1.3 Aircraft information

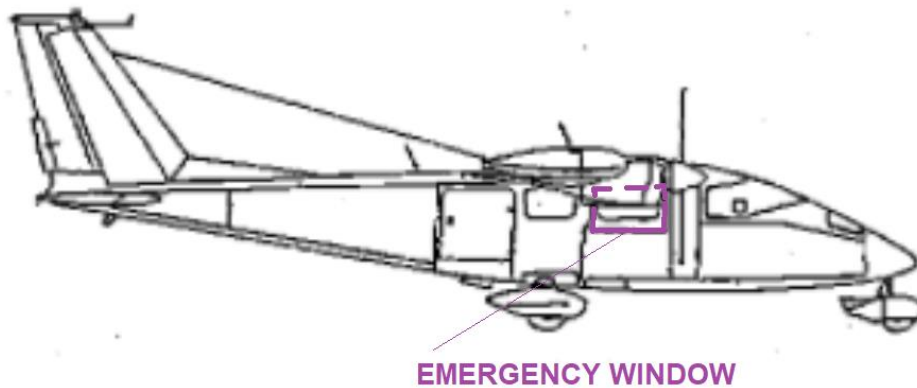
### 1.3.1 General

The Partenavia P.68B "Victor" certification was granted on 24 May 1974 to Partenavia. The type certificate was transferred to Vulcanair in 1998.

The P68B is a six-seat twin piston engine, high wing airplane with fixed tricycle landing gear. The P68B is an evolution of the original P68, with a lengthened fuselage.

**Table 1: Airframe data**

Model	Partenavia P68B
Serial number (S/N)	16
Manufacturer	Partenavia (Vulcanair)
Year of manufacture	1974



**Figure 2: P68B Drawing**

Vulcanair stated that the accidental release of the emergency exit window was never reported before by P68 operators; the concerned emergency exit configuration involves all P.68B aircraft up to s/n 122 of which only 80 aircraft are still in service.

### 1.3.2 Operation of the emergency window

The opening of the emergency window was verified (Maintenance schedule; Emergency exit – check for condition and security) during maintenance.

The handle can be put in two extreme positions;

- Upwards (window locked)
- Downwards (window released)

The window is held in position by two metal strips sliding into locking slots solidarizing the bottom part of the window with the aircraft structure. The top part of the window is inserted in a U-shaped angle profile.



Figure 3: Emergency window

The system was tested and found in working condition.

After the event, the aircraft was fitted with the emergency window of another Partenavia P68 aircraft of the same company undergoing maintenance. This showed that the aircraft structure was intact.

A picture taken after the event shows the locking metal strip stowed (window release position)

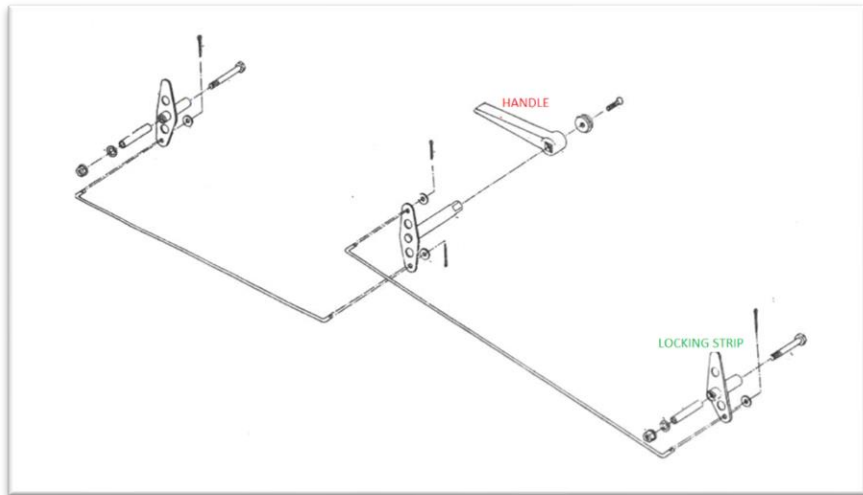


Figure 4:Emergency window operating mechanism

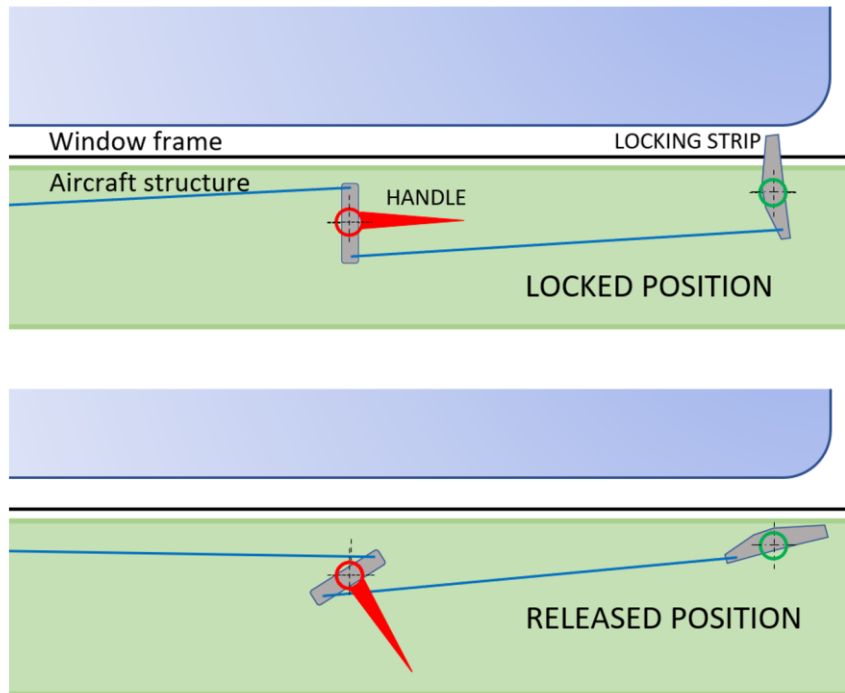


Figure 5: Emergency Window handle operation



Figure 6: Handle in the 'closed 'position





Figure 7: Handle in the 'release' position



Figure 8: Emergency window topside installation

### 1.3.3 Maintenance

The maintenance programme shows regular checks of the emergency exit locking mechanism:

100 FH Inspection schedule			
(4) EMERGENCY EXIT - Check for condition and security.	0		

And

3.2. Pre-flight inspection
<p>This paragraph is for the pilot and/or mechanic and should be performed before each flight</p> <p>(...)</p> <p><i>o. Emergency window fastened.</i></p> <p>(...)</p>

### 1.3.4 Markings

The markings pertaining to the emergency window are defined in the Pilot Operating Handbook (POH). The check lists included in the POH do not cover specifically a check of the latching of the emergency window.

**PLACARDS:**

**1. On Emergency Windows:**

**"EMERGENCY EXIT - ROTATE HANDLE - PUSH WINDOW OPEN"**

The aircraft was equipped a strip showing the prescribed text.



**Figure 9: Emergency window unlocking handle and marking**



The POH does not depict the actual placard. The aircraft was also not equipped with a marking showing the handle positions (window locked / released). Another aircraft of the same type, age and same operator, present in the hangar during the inspection, showed the same situation.

As a response to this safety investigation, current TC Holder Vulcanair started a research to determine the valid configuration for the marking of the emergency handle. Due to old age of the involved aircraft and considering that Partenavia did not usually issue approved data relating to the installed placards, the research of the available material was not easy. After a first punctual research of all available documentation (DWG, reports, etc.) in Vulcanair's archives, the Owners / Operators / CAMO of all P.68 "Victor" / P.68B "Victor" aircraft have been contacted by email, as per EASA suggestion, in order to receive data, photos and any other relevant information concerning the emergency exit window configuration (included related lock-unlock handle and installed placards).

The received photos of the aircraft delivered before and immediately after the involved aircraft (P.68B S/N 16) show a red placard with relative white arrow in correspondence with the emergency exit window lock-release handle; this placard indicates clearly how to unlock the emergency exit window and then the correct position of the relative handle.



Figure 10: P.68 S/N 03



Figure 11: P.68 S/N 06



Figure 12: P.68 S/N17



Figure 13: P.68 S/N 19



Figure 14: P.68 S/N 71



Figure 15: P.68 S/N 98

In addition, some handles are secured with a safety wire in the closed position.

## 1.4 Regulation

The airplane was certificated in the Normal Category against FAR 23 effective 1 February 1965 including Amdt 1 through 6. The emergency exit assembly has been certified in accordance with FAR FAR23.807.

The current text of FAR 23.807 - Emergency Exits reads;

(a) Number and location. (...)

(b) *Type and operation.* Emergency exits must be movable windows, panels, canopies, or external doors, openable from both inside and outside the airplane, that provide a clear and unobstructed opening large enough to admit a 19-by-26-inch ellipse. Auxiliary locking devices used to secure the airplane must be designed to be overridden by the normal internal opening means. The inside handles of emergency exits that open outward must be adequately protected against inadvertent operation.<sup>2</sup> In addition, each emergency exit must—

(1) Be readily accessible, requiring no exceptional agility to be used in emergencies;

(2) Have a method of opening that is simple and obvious;

(3) Be arranged and marked for easy location and operation, even in darkness;

(4) Have reasonable provisions against jamming by fuselage deformation; and

(5) In the case of acrobatic category airplanes, allow each occupant to abandon the airplane at any speed between  $V_{SO}$  and  $V_D$ ; and<sup>2</sup>

(6) In the case of utility category airplanes certificated for spinning, allow each occupant to abandon the airplane at the highest speed likely to be achieved in the maneuver for which the airplane is certificated<sup>2</sup>

(...)

The FAR23.1557 – Miscellaneous markings and placards reads;

(...)

(d) *Emergency exit placards.* Each placard and operating control for each emergency exit must be red. A placard must be near each emergency exit control and must clearly indicate the location of that exit and its method of operation.

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<sup>2</sup> the underlined text was introduced by Amendment 23-49 of 03/11/1996, therefore not applicable for the P68 type.

## 2. ANALYSIS

### 2.1 The marking of the emergency exit operating handle

The release of the window in flight was obviously caused by the operating handle being inadvertently left in the 'release' position after maintenance. The inadequate position was not identified during the mandatory inspections mandated by the POH and Maintenance Manual.

The marking present on both aircraft, although literally complying with the wording found in the POH, did not determine a clear and unambiguous position of the emergency window operating handle (window locked / released).

The absence of a clear indication makes it difficult for anyone to determine whether the handle is in the correct position, as required during pre-flight check.

The POH does not depict the actual placard required. The information was not readily available, even for the Type Certificate Holder, Vulcanair, that took over for the original aircraft manufacturer, Partenavia. Vulcanair started a fleet-wide search to determine the correct configuration for the marking.

The search revealed a placard, present on many airplanes of the same age as the investigated airplane. The search also revealed small differences in the markings; the majority concerns metal plates, riveted onto the operating handle back plate; one (from S/N 17) seems of another type, glued in place. The handle back plate of the investigated airplane (S/N16) does not show rivet holes, nor evidence of previous presence of glue.

A marking plate may have been present on the investigated airplane at a given time, then fell off and was not being replaced, or this plate would have been introduced after manufacturing (some are showing a safety wire securing the handle in its closed position; a requirement introduced in 1996 in FAR23.807), but not applied on the investigated airplane.

The investigation could not determine why the marking plate was not present on this airplane.

### 3. CONCLUSIONS

#### 3.1 Findings as to causes and contributing factors

- The release of the emergency window was most probably due to the operating handle unintentionally left in the “window release” position after maintenance and this condition was not detected during pre-flight check.

***[cause]***

*[Human - Action/decision – Aircraft inspection – Emergency exit – inadequate inspection]*

*[Technical – Aircraft structure – Emergency exit – Unintentional use/operation]*

- The positions (locked – released) of the emergency window operating handle are not identified.

***[contributing factor]***

*[Operational – Aircraft handling/service – Placards and markings – Not specified]*

*[Operational - Development – Design – Design of document/info]*

#### 3.2 Findings as to factors that increase(d) risk

- The operation of the handle was not protected for unintentional action.

***[contributing factor]***

*[Technical – Aircraft structure – Emergency exit – Design]*

*[Technical – Aircraft structure – Emergency exit – Unintentional use/ operation]*

*[Technical - Development – Design – Equipment design]*

## 4. SAFETY ACTIONS AND RECOMMENDATIONS

### 4.1 Safety issue: Unclarity about the position of the operating handle

In absence of reference data, the maintenance organisation took the preliminary initiative to mark the extreme positions of the emergency widow opening handle.



Figure 16: Safety action; marking of the handle position

As a response to this safety investigation, current TC Holder Vulcanair initiated a fleet-wide research of the correct configuration of the placard to be used in relation with the emergency window handle (see 1.3.4.). In accordance with EASA, Vulcanair has issued the Service Letter No.65 in order to inform all aircraft Owners, Operators, CAMO and Maintenance Organizations of all P.68B aircraft up to s/n 122 to be aware to check, during the pre-flight phase and/or the emergency exit window inspection scheduled for every 100 flight hours (as per approved Maintenance Manual), the presence of a proper and clear placard in correspondence of the lock-unlock handle of the emergency exit window and furthermore to contact Vulcanair in presence of missing placard in order to receive the suitable one. The Service Letter No65 is in appendix.

The AAIU(Be) supports this action and has no further recommendation.

## 5. ANNEX

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Approved by Vulcanair Design Organisation

**P.68 VARIANTS**



The technical content of this document is approved under the authority of the DOA ref. EASA.21J.009

**SERVICE LETTER  
No. 65 Rev.0**

Design Organisation Approval No. AS-SL/21/008 dated 10 December 2021

**SUBJECT: EMERGENCY EXIT WINDOW PLACARD**

**AIRCRAFT AFFECTED:** All P.68B aircraft variant up to s/n 122

# **ALERT**

**TO OWNER, OPERATOR, CAMO AND MAINTENANCE ORGANISATION OF AFFECTED AIRCRAFT:**

The purpose of this Service Letter is to inform all aircraft Owners, Operators, CAMO and Maintenance Organisations to be aware to check, during the pre-flight phase and/or the emergency exit window inspection scheduled for every 100 flight hours (as per approved Maintenance Manual), the presence of a proper and clear placard in correspondence of the lock-unlock handle of the emergency exit window.

The missing of an adequate emergency exit window placard may be cause of an accidental disengagement of the emergency exit window.

The emergency exit window placard expected in correspondence of the lock-unlock handle, installed on all Partenavia P.68B aircraft up to s/n 122, is shown in Figure 1 hereunder.





**Figure 1 Emergency exit window placard (only for reference)**

The above placard should be installed in correspondence of the lock-unlock handle of the emergency exit window when complying with this Service Letter.

In presence of missing placard, send some photos about the emergency exit window with related lock-unlock handle to Vulcanair via e-mail at [continued.airworthiness@vulcanair.com](mailto:continued.airworthiness@vulcanair.com) or via fax at No. +39.081.5918172. Vulcanair will supply you the suitable placard.

## ABOUT THIS REPORT

General	
<b>What?</b>	Safety investigation reports are a technical document that reflects the views of the investigation team on the circumstances that led to the accident or serious incident and is conducted in accordance with Annex 13 to the Convention on International Civil Aviation and Regulation (EU) No 996/2010.
<b>Objective</b>	<b>The sole objective of safety investigations is the determination of the causes, and to define safety recommendations in order to prevent future accidents and incidents. It is not the purpose of this investigation to apportion blame or liability.</b> In particular, Article 17-3 of Regulation (EU) 996/2010 stipulates that the safety recommendations made in this report do not constitute any suspicion of guilt or responsibility.
<b>Investigation authority</b>	The Air Accident Investigation Unit of Belgium, (AAIU(Be) for the rest of this publication). It is the Belgian permanent national civil aviation safety investigation authority as defined in Article 4 of Regulation (EU) No 996/2010 and established in accordance with the Royal Decree of 8 December 1998. This unit is part of the Federal Public Service Mobility and Transport and is functionally independent from the Belgian Civil Aviation Authority and other interested parties.
This investigation	
<b>Investigation initiation</b>	AAIU(Be) was notified of the occurrence by the report made at the European Aviation Safety Reporting Portal (ECCAIRS) by the operator and the Antwerp Airport Inspection services.  Investigators inspected the aircraft and the recovered part on 5 February 2020.
<b>Scope</b>	<b>Limited</b>  For this occurrence, a limited-scope, fact-gathering investigation and analysis was conducted in order to produce a short summary report. The investigation mainly focussed on the actions and conditions directly relating to the occurrence and might not cover all aspects of the aircraft operation and/or possible underlying safety factors due to the expected safety benefit of it and/or the extent of evidence/resources available.
<b>Other parties involved</b>	ANSV Italia as State of Registration, Design and Manufacture AAIU Bulgaria as State of Operator  AAIU(Be) would like to thank the mentioned parties above and all other entities and individuals that have contributed to this safety investigation.