



**Serious incident** to the PILATUS PC6 B2H2  
registered **F-GEBS**  
on Sunday 23 March 2025  
at Saint-Etienne Loire

<b>Time</b>	Around 10:00 <sup>1</sup>
<b>Operator</b>	LYON BRON PARACHUTE TANDEM
<b>Type of flight</b>	Skydiving activity
<b>Persons on board</b>	Pilot
<b>Consequences and damage</b>	Aeroplane slightly damaged

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.

## **Jamming of elevator trim control, precautionary landing**

### **1 HISTORY OF THE FLIGHT**

The pilot, accompanied by skydivers, took off from runway 16<sup>2</sup> of Saint-Galmier aerodrome at around 09:20. After the skydivers had jumped overhead the aerodrome, the pilot put the aeroplane into descent to join the start of the right-hand base leg for runway 16.

On descending through 4,000 ft, the pilot felt a point of friction on the control column and observed that the elevator trim was jammed in the “full nose down” position. On applying substantial force to take a nose-up attitude, combined with an increase in turbine power, he managed to stop the descent and hold level flight. He then looked for the configurations which would enable him to pilot the aeroplane in the vertical profile (climb/descent) by combining speed, turbine power and flap deflection. Meanwhile, he informed the Clermont-Ferrand controller with whom he was in radio contact, of the problem with controlling the aeroplane and indicated that he was going to divert to Saint-Etienne Loire aerodrome to benefit from a longer paved runway<sup>3</sup>.

He managed to land on runway 17 without any problem and taxied to the parking where he brought the aeroplane to a stop.

<sup>1</sup> Except where otherwise indicated, the times in this report are given in local time.

<sup>2</sup> Unpaved runway measuring 650 m x 50 with a threshold displaced by 135 m.

<sup>3</sup> Paved runway 17/35 measuring 2,300 m x 45 m, landing distance available of 1,817 m on runway 17.

## 2 ADDITIONAL INFORMATION

### 2.1 Pilot experience

<b>Age</b>	42 years
<b>Licence(s) (type and date of issue)</b>	ATPL (A) issued on 4 March 2019
<b>Ratings</b>	Skydiving since 2007 PC6 CR obtained in 2002 PC6 SET valid until 31 March 2027
<b>Medical fitness certificate</b>	Valid

<b>Total experience</b>	8,800 flight hours, including 6,200 hours as pilot-in-command 4,720 flight hours on the PC6
<b>Experience in last 30 days</b>	1.5 h

### 2.2 Aircraft information

The aeroplane registered F-GEBS is a PILATUS PC6 B2H2 equipped with a Pratt & Whitney PT6A-34 engine and configured for skydiving. This PC6 model is equipped with a manual elevator trim control.

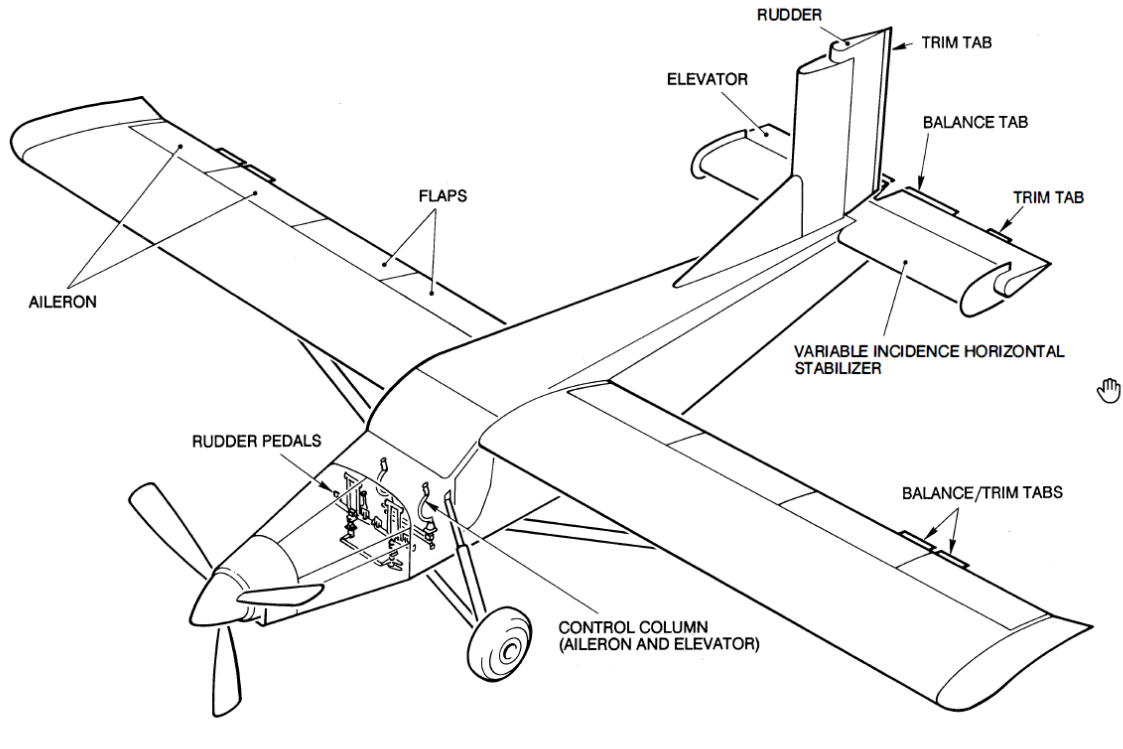
The aeroplane had logged around 25,530 flight hours and the engine 2,775 operating hours.

### 2.3 Description of tail plane

#### 2.3.1 Overview

The tail plane is composed of an elevator, a variable incidence horizontal stabilizer and a trim tab. The tail plane control system is entirely mechanical:

- the movement of the elevator is controlled by the longitudinal movement of the control column via a set of rods, bellcranks and cables;
- the variable incidence horizontal stabilizer is adjusted using a handle situated in the cockpit. When the pilot operates the handle, this causes, via a cable, the actuator body to rotate around its axis, making the actuator rod extend or retract and modify the setting of the variable incidence horizontal stabilizer;
- the balance tab reduces the force required to move the control column, its movement is automatic.



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Figure 1: Pilatus PC-6 flight controls (source: Pilatus maintenance manual)

### 2.3.2 Control system

The schematic diagram below illustrates the control system:

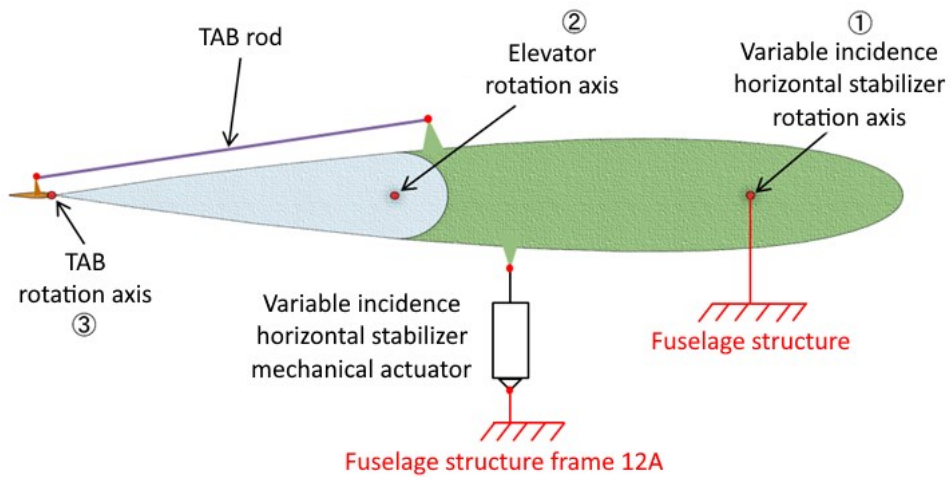
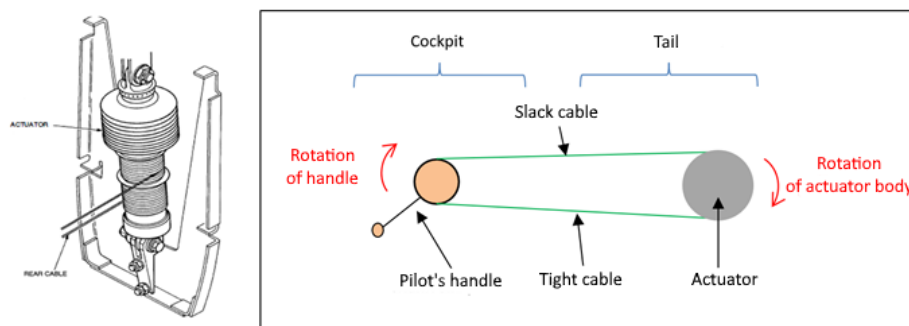


Figure 2: variable incidence horizontal stabilizer control system (source: BEA)

- the variable incidence horizontal stabilizer pivots around axis ① with respect to the fuselage and is moved by a mechanical actuator situated on the lower surface;
- the elevator pivots around axis ② with respect to the variable incidence horizontal stabilizer and is moved by cables (not shown in **Figure 2**) connected to the control column by a set of rods and bellcranks;
- the tab pivots around axis ③ with respect to the elevator. Its deflection is automatically combined with that of the elevator.

### 2.3.3 Description of variable incidence horizontal stabilizer control system

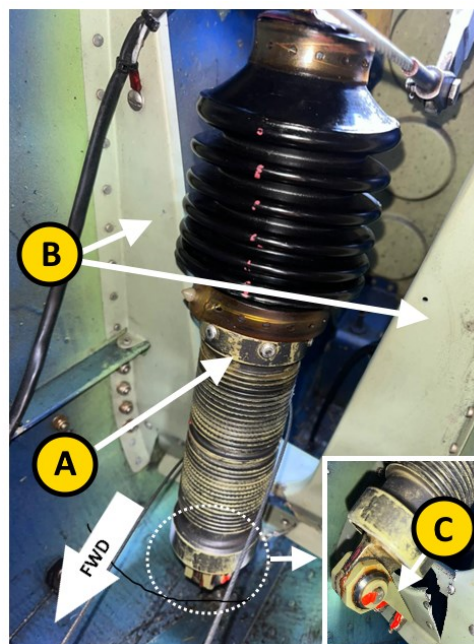
**Figure 3** below illustrates the operation of the elevator trim control system situated in the cockpit and the operation of the associated actuator.



*Figure 3: elevator trim control system  
(source: Pilatus maintenance manual, diagram BEA)*

### 2.4 Examination of the aircraft

The examination of the aeroplane principally concentrated on the tail section where the elevator trim actuator is situated (see **Figure 4**, detail **A**) and in particular, on structural frame FR12A (detail **B**) holding the lower connecting piece (detail **C**) of the elevator trim actuator.

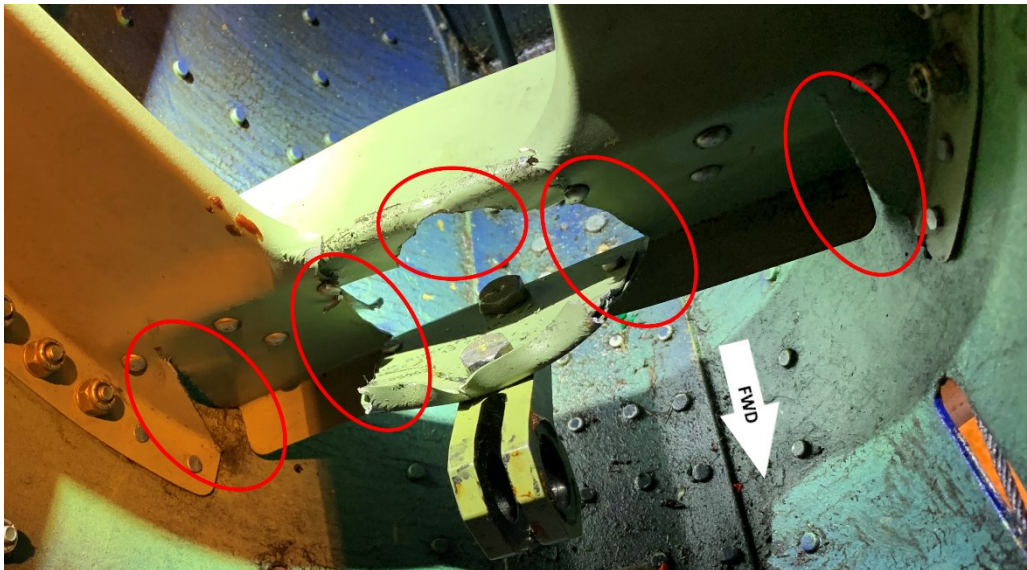


*Figure 4: view of frame FR12A, elevator trim actuator and connecting piece (source: BEA)*

Tests moving the elevator trim control, carried out on the ground, before the actuator was removed, showed that:

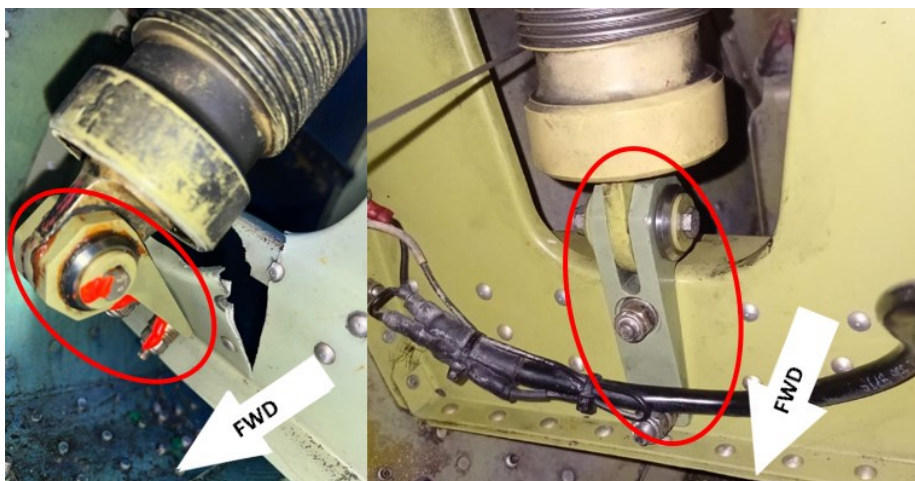
- the control handle could be turned freely and easily in both directions<sup>4</sup>;
- the actuator rod extended and retracted normally;
- the movement of the actuator rod was transmitted to the connecting piece and caused the frame wall to deform by pushing it forward.

The elevator trim actuator was no longer correctly fastened to frame FR12A and had moved forwards and downwards, resulting in the slackening of the cable which controls the actuator. The structural frame was damaged and torn in several places (see **Figure 5**).



*Figure 5: view of frame FR12A and damage (actuator removed) (source: BEA)*

The examination found that the lower connecting piece of the elevator trim actuator was incorrectly positioned. This connecting piece had been installed in the wrong direction.



*Figure 6: installation observed (on LH side), correct installation (on RH side) (source: BEA)*

<sup>4</sup> On the ground, the aerodynamic forces exerted on the elevator and transmitted to the elevator trim actuator are not present.

## **2.5 Maintenance of aeroplane and reference documentation**

### **2.5.1 Maintenance history**

The aeroplane had undergone a 100-hour overhaul and an annual inspection between 9 December 2024 and 4 February 2025 in a Part-145 approved aircraft maintenance workshop. It had flown seven hours after this inspection.

The job file associated with the maintenance operations showed that an inspection of frame FR12A holding the lower connecting piece of the elevator trim actuator had been carried out. This inspection consists in disassembling the connecting piece, inspecting the frame to check that there are no cracks and re-assembling the connecting piece.

This task had not been identified as a critical task in the Aircraft Maintenance Manual (AMM) and was therefore not the subject of a specific check.

### **2.5.2 Reference documents**

The applicable documentation for this maintenance task is AMM 27-45-11 (removal of elevator trim actuator) and AMM 53-30-00 which describes the operations for installing and removing the lower connecting piece of the elevator trim actuator, along with the inspections of frame FR12A.

The title of the chapter which covers the connecting piece installation operation refers to Figure 601 (see Figure 7) which identifies the components and includes the three possible configurations according to the trim control (one for the electric trim, two for the manual trim). In the case of F-GEBS, it was configuration 2A.

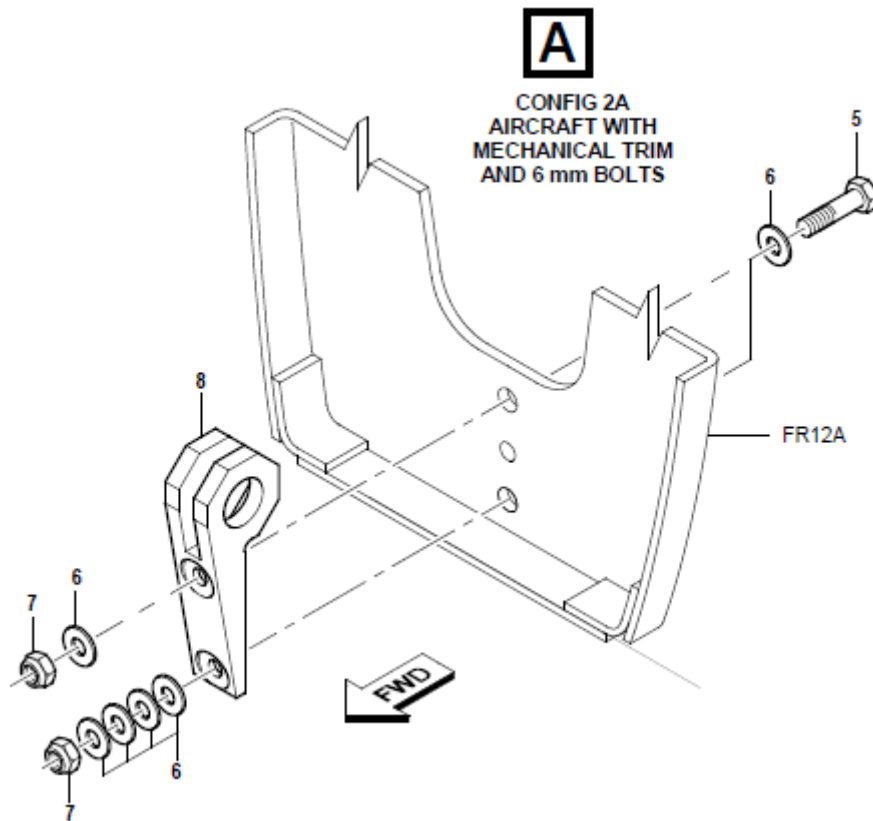


Figure 7: excerpt from Figure 601 of AMM 53-30-00 (source: Pilatus)

The text associated with the operation to install the connecting piece on frame FR12A (see **Figure 8**) does not specify the installation direction and does not warn of the possibility of inverting the direction.

- |  |
|--|
| <p>(b) Install the connecting piece (8) with the bolts (5), washers (6) and nuts (7). Install the same quantity of washers (6) under the lower nut (7) that you recorded in the removal procedure.</p> |
|--|

Figure 8: excerpt from AMM 53- 30 -00 (source: Pilatus)

## 2.6 Examination of frame, connecting piece and failure mode

Frame FR12A is in the shape of a U. It is made up of:

- the main wall **1** in the shape of a U;
- a riveted angle **2** to strengthen the frame;
- a riveted reinforcement **3** (extra thickness) in the area holding the lower connecting piece of the elevator trim actuator.

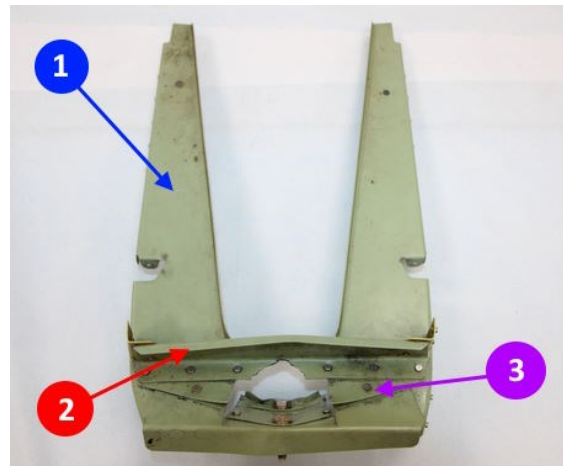


Figure 9: rear view of frame FR12A  
(source: BEA)

The following points describe the connecting piece and its attachment to the frame:

- the connecting piece is attached to frame FR12A by two bolts (see **Figure 7**);
- the upper attachment passes through three thicknesses: the vertical part of the angle, the reinforcement and the skin of the frame. The lower attachment passes through two thicknesses: the reinforcement and the skin of the frame;
- the two attaching holes in the connecting piece are perpendicular to the surface which is in contact with the frame;
- the opposite surface is bevelled and the two spotfacings accommodate the washers and nuts to ensure the parallelism between the contact surface, the washer/nut seat and the screw head seat.

The incorrect assembly of the connecting piece of the trim actuator led to the application of out-of-plane loads, corresponding to a mode of stress for which frame FR12A has lower mechanical strength than under normal conditions (attaching part installed in the correct direction). The introduction of an unintended stress component in the sheet metal elements caused deformation and then tearing of part of the frame which then propagated.

## 3 CONCLUSIONS

*The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation.*

### Scenario

During the annual or 100-hour inspection, in order to inspect a structural frame, the elevator trim actuator and the associated lower connecting piece were removed by the maintenance workshop mechanic according to the AMM job card.

At the end of this inspection during which no anomaly was identified, the mechanic attached the connecting piece to the frame without realising that he had positioned it in the wrong direction. The elevator trim actuator was then attached to the connecting piece. As it is a hinged connection and the actuator is movable, it was possible to position the actuator on the connecting piece.

This task was not considered a critical task and did not give rise to a specific check and the operation was validated as it was. On completion of all the maintenance operations, the aeroplane resumed flights.

In the following seven flight hours, the aerodynamic loads applied to the tail plane were transmitted to frame FR12A in an adverse stress mode linked to the non-compliant installation of the connecting piece of the trim actuator and made it possible for the frame to collapse.

During the incident flight, while descending with the elevator trim set to "full nose down", the frame tore in several places, causing the elevator trim actuator to collapse. This collapse modified the setting of the variable incidence horizontal stabilizer and jammed the elevator trim control, which was felt by the pilot.

The pilot's actions (increasing power and extending the flaps) allowed him to regain limited but sufficient control of the aeroplane to make a precautionary landing at a nearby aerodrome.

### **Contributing factors**

The following factors may have contributed to the incorrect assembly of the connecting piece:

- maintenance documentation that contains no mention warning of the possibility of incorrectly positioning the connecting piece, this risk not having been anticipated;
- a maintenance task that was not identified as critical and that did not give rise to any specific check.

### **Measures taken following incident**

The maintenance workshop added a supplement to the job card to illustrate the correct positioning of the connecting piece and put the task on the list of critical tasks requiring a specific check

The maintenance workshop manager also had the aeroplanes that had undergone an inspection of frame FR12A in the preceding months in the maintenance workshop checked for the correct installation of the connecting piece. No anomalies were found on the aeroplanes inspected.

The aeroplane manufacturer decided to modify the maintenance documentation for this operation to better document the positioning of the connecting piece and to warn of the possibility of its incorrect installation.

These modifications were introduced with the publication of Revision No 40 of the Aircraft Maintenance Manual of 30 November 2025.

***The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.***