Accident to the LEOPOLD DIDIER - Pti'Tavion identified 03AEG on Thursday 18 July 2024 at Isle-Saint-Georges

Time	Around 12:00[1]
Operator	Private
Type of flight	Instruction
Persons on board	Instructor and student pilot
Consequences and damage	Instructor and student pilot fatally injured, microlight destroyed
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.	

Mid-air rupture of a wing, loss of control, collision with ground, in instruction

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on statements, radio-communication recordings and radar data.

An instructor and a student pilot, owner of the microlight, took off from Vénus chateau private microlight base LF3357 at approximately 11:30 for an instruction flight. They then very probably carried out a touch-and-go at Saucats[2] before flying east and joining the Garonne river which they then flew along. The wreckage of the microlight was found at Isles-Saint-Georges, on the banks of the river, at 7 NM north of Vénus chateau microlight base and 5 NM east of Saucats aerodrome.

2 ADDITIONAL INFORMATION

2.1 Meteorological information

The meteorological conditions estimated by Météo-France at Isles-Saint-Georges at the time of the accident were the following: CAVOK, wind direction varying between 110° and 140° with speeds of 5 to 10 kt. The temperature was 30°C.

2.2 Pilot information

The 46-year-old microlight instructor held a microlight pilot certificate obtained in December 2016 along with microlight helicopter (class 6) and fixed-wing (class 3) ratings, the fixed-wing instructor rating obtained in June 2019 and passenger carrying privileges. The instructor's microlight experience could not be determined.

[1] Except where otherwise indicated, the times in this report are given in local time.
[2] Several statements indicated that the pilot of 03AEG had been heard on the A/A frequency.

The instructor also held an aeroplane PPL with a valid SEP land rating at the time of the accident. On 24 February 2024, he had totalled 94 aeroplane flight hours, including 47 hours as pilot-in-command.

The 42-year-old student pilot held an FFPLUM licence as a fixed-wing microlight student pilot.

2.3 Microlight information

2.3.1 General information

The Pti'tavion is a fixed-wing microlight made of tubing covered in aircraft fabric with a tricycle landing gear and high wings. It features a system whereby the wings can be folded along the fuselage, making it easier to store or transport (see **Figure 1**).

Figure 1: Pti'tavion with wings folded along fuselage to be transported in a trailer (source: owner of a Pti'tavion)

Figure 2: Pti'tavion with wings deployed (source: owner of a Pti'tavion)

Five fastening points that can be disassembled, ensure the rigidity of each wing with respect to the fuselage. Four of these directly connect the wing to the fuselage. They are shown in the diagram below.

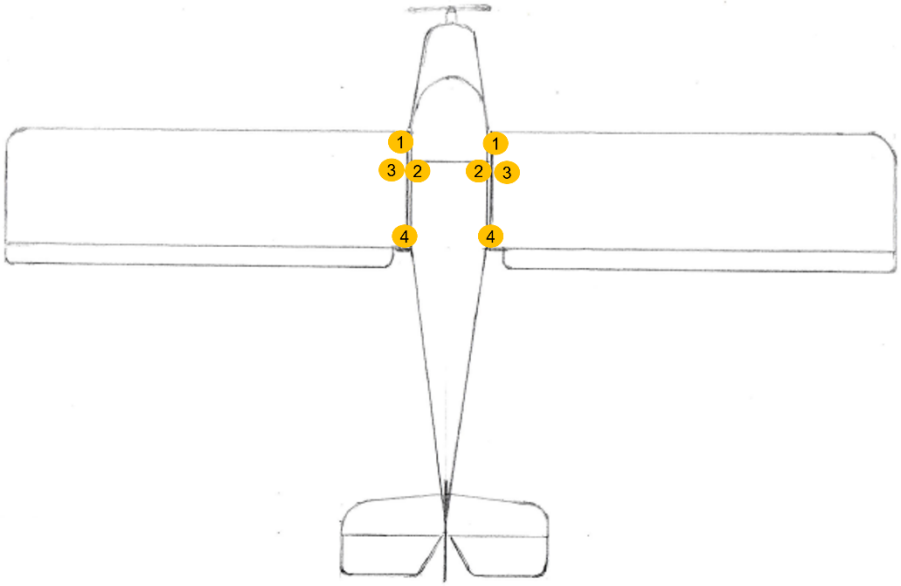

Figure 3: diagram showing position of wing fastening points to fuselage, top view (source: technical file for the Pti'tavion VI prototype; BEA annotations)

In addition to these four points, the wing-fuselage connection is also partially ensured by two pairs of struts, attached to the wing structures and the landing gear.

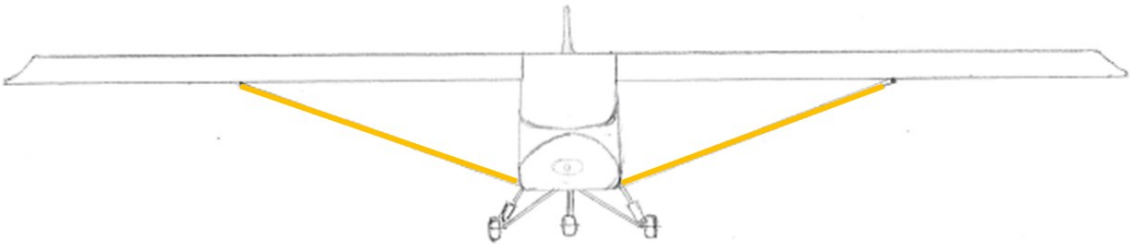

Figure 4: diagram showing position of struts (in yellow), view looking aft (source: technical file for the Pti'tavion VI prototype; BEA annotations)

2.3.2 Structural differences on Pti'tavions

LEOPOLD DIDIER designed and built the Pti'tavion from 1998 to 2014. 03AEG was built by this company in 2012.

The Pti'tavion patent was acquired by Pti'tavion Lille Metropole in 2014. This latter company ceased trading in May 2022.

In parallel, from 2014, the designer of the LEOPOLD DIDIER microlights built the "DIDL" microlights with a wing structure similar to that of the Pti'tavion. The last DIDL was manufactured in 2023.

The BEA's discussions with the DSAC and the former head of Pti'tavion Lille Metropole revealed that the diameter of certain structural elements, the arrangement of the spacers, and the position of the wing strut fastenings could vary between Pti'tavion aircraft.

2.4 Analysis of site and wreckage

2.4.1 General information

The wreckage was found complete and grouped together. The position of the wreckage and the absence of marks in the environment indicate that the aeroplane very probably struck the ground with a steep nose-down attitude. Furthermore, the extent of the damage to the nose showed there was high energy at the time of the collision with the ground.

The examination of the flight controls, which was only partial due to the extent of the damage, revealed no pre-impact damage.

The structure surrounding the cockpit, including the wing fastening points to the fuselage, had to be cut away by emergency responders during their intervention before the BEA arrived on site.

2.4.2 Wings

The right wing was complete, still connected to the fuselage and showed relatively little deformation. The broken structural elements had fracture faces indicating sudden failure. Signs of soil, indicating points of contact between the wing and the ground, were present on the lower surface and along the leading edge of the wing.

A weld, associated with a reduction in the diameter of the steel tubes forming the front spar, was observed on the right wing of 03AEG.

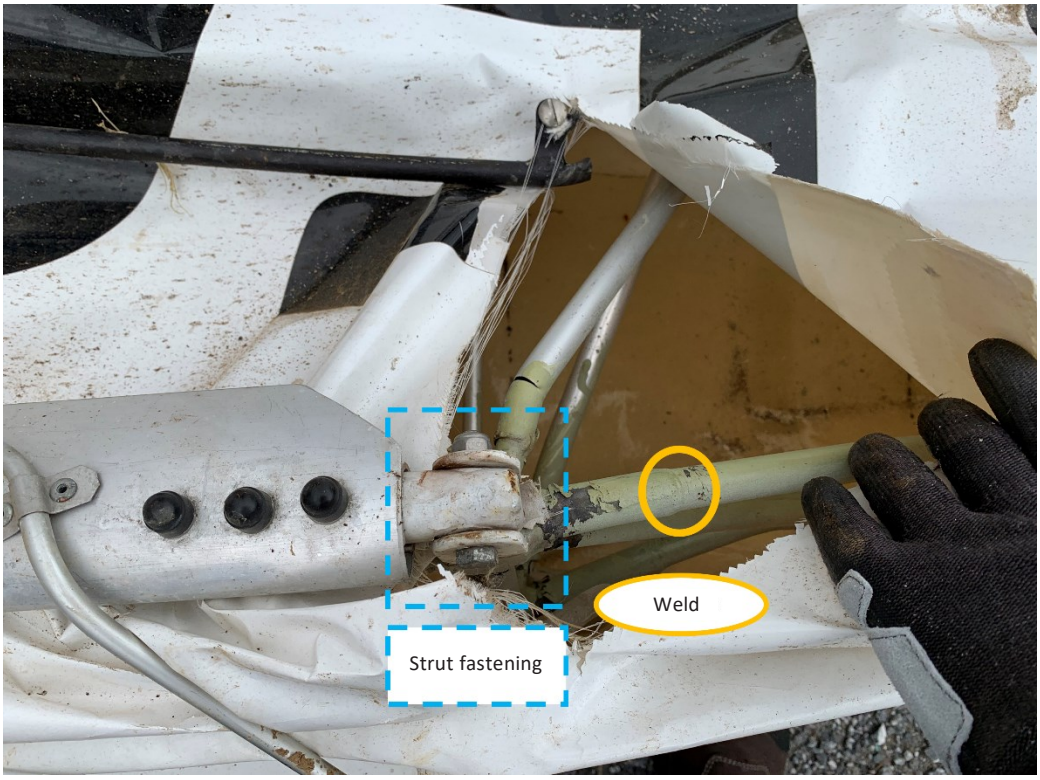

Figure 5: reduction in diameter of forward spar observed on 03AEG (source: BEA)

The left wing was complete, but part of it was folded upwards, bent along a line located slightly after the strut fastenings in the direction of the wing tip (see **Figure 6**). Signs of soil were visible on the lower surface of the half of the wing on the root side and on the upper surface of the half of the wing on the tip side.

Based on the signs of soil on the wings and the very different damage observed between the right and left wings, the left wing most probably ruptured in flight, unlike the right wing.

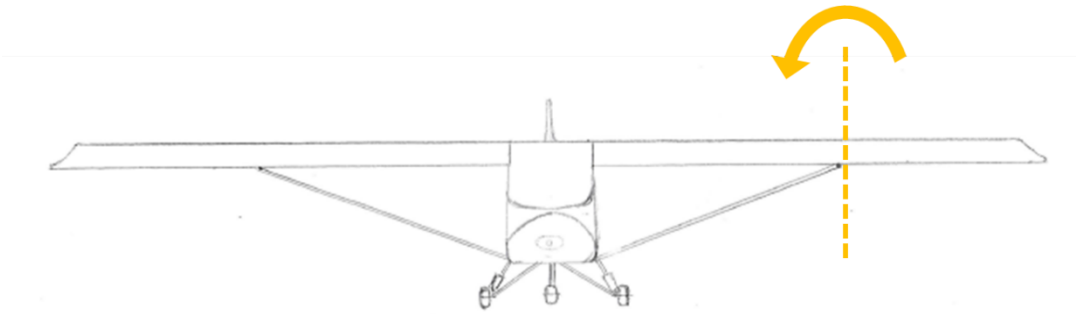

Figure 6: diagram showing the line of bending of the left wing (yellow dashes) (source: technical file for the Pti'tavion VI prototype; BEA annotations)

Figure 7: view of left wing of 03AEG with partial separation of aircraft fabric (source: BEA)

All the fastening points of the left wing were found and examined by the BEA. The damage observed on these components was most likely the result of the impact with the ground or the intervention by the emergency responders. This damage did not indicate any defect in the wing's fastening to the fuselage.

The structure of the left wing was examined, and no signs of fatigue were observed. In particular, all the ruptures observed where the wing had bent exhibited a fracture face characteristic of a sudden failure and were thus most likely due to the exceedance of the maximum permissible load on the wing structure before impact with the ground.

The left wing aileron was found dislodged from its housing on the wreckage. The absence of deformation at the interface between the aileron and the wing structure suggests that the aileron was disconnected at the time of the impact with the ground. However, the BEA was unable to determine whether this disconnection was prior to or a consequence of the rupture of the wing.

2.5 Analysis of audio data

Video footage from a security camera belonging to a house near the accident site was analysed.

The images show no view of the sky or the horizon, and no movement was detected within the camera's field of vision. The camera's sound recording contained a continuous signal coming from a propeller or engine, probably that of the 03AEG.

At 11:57:52[3], the continuous signal was covered by a loud noise, probably of aerodynamic origin. This noise stopped at 11:57:58 with a sound similar to the noise of a collision.

2.6 Statement

An eyewitness without any aeronautical experience, indicated that he had seen "an aeroplane" at a height he thought was between 20 m and 30 m, with a nose-down attitude which then collided with the ground. According to this eyewitness, the aeroplane was not whole before the collision with the ground.

3 CONCLUSIONS

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

Scenario

A few minutes into the flight, the left wing of the microlight ruptured close to the strut fastenings. It is probable that the bending damage and the sudden ruptures observed were due to the exceedance of the maximum permissible load on the wing structure. The BEA was not able to determine if this rupture was the result of high load factors, a weakness in the wing structure or a combination of these two factors.

Measures taken following accident

The DSAC informed the BEA that it would be shortly publishing:

- a bulletin addressed to all Pti'tavion and DIDL owners informing them of the accident to 03AEG and recommending they avoid any situation that could lead to high load factors;
- an airworthiness directive prohibiting flights with paying passengers on Pti'tavion and DIDL aircraft.

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

[3] Times indicated by the camera.