



Accident to the CESSNA 208
registered **F-HVPC**
on Thursday 1 August 2024
at Vannes

Time	Around 14:05 ¹
Operator	École de Parachutisme Sportif de Vannes Bretagne (EPSVB)
Type of flight	Parachute drop
Persons on board	Pilot and 14 skydivers
Consequences and damage	Aeroplane slightly damaged, one skydiver injured
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.	

Untimely deployment of a parachute at aeroplane door, in climb, during a parachute drop flight

Note: the following information is principally based on statements made by the on-board skydivers and the pilot

1 HISTORY OF THE FLIGHT

The pilot took off for a parachute drop flight with jumps to be made at a height of 1,200 m and then 4,000 m. During the climb, at around 450 m, the skydiver sat on the floor and next to the door², back turned to the direction of flight, slightly opened the door by raising it ten or so centimetres in order to ventilate the cabin, due to the high temperature in the aeroplane.

The pilot chute (hand deploy) of this skydiver, partially out of its housing³, was caught by the airflow towards the outside of the aeroplane, which successively caused the main container to open, the extraction of the bag containing the main canopy, and the deployment of the canopy outside the aeroplane under the aeroplane's left horizontal stabilizer. The aerodynamic forces generated by the deployment of the canopy first pulled the skydiver backwards, towards the rear door jamb and then through the vertical sliding door slats.

During this sequence, the right-hand set of risers⁴ caught on the door frame, separated from the parachute harness and triggered the deployment of the reserve canopy. The reserve canopy deployed and rubbed against the underside of the aeroplane's left-hand horizontal stabilizer without getting caught on it.

¹ Except where otherwise indicated, the times in this report are in local time.

² Sliding door made of Plexiglas slats moved up and down by hand.

³ Elastic fabric pouch.

⁴ Parachute component which groups together and connects the suspension lines of the canopy to the parachute harness. There are two groups of risers (a left-hand and a right-hand). Each group of risers is composed of a front riser and a rear riser.

The skydiver received an injury to his leg when he was ejected and found himself flying under the deployed reserve canopy while the main canopy was still connected to the parachute harness by the group of left-hand risers. He managed to pilot his reserve canopy to the ground and landed while preventing the main canopy from interfering with the reserve canopy.

The aeroplane pilot, who heard an abnormal noise during the occurrence and felt vibrations in the stick, decided to curtail the flight. He landed a few minutes later.

2 ADDITIONAL INFORMATION

2.1 Damage observed on the aeroplane and the parachute

The following damage was observed on the aeroplane:

- the three lower slats of the vertical sliding door were damaged and had come out of the rear slide guiding the sliding door. The connection between the third and fourth slat was partially torn off;
- the aeroplane's skin at the rear door jamb was deformed over around 8 cm and around 50 cm above the aeroplane floor;



*Figure 1: damage to door (jamb and slats)
(source: skydiving school)*

- two areas of rub marks were visible on the leading edge and lower surface of the aeroplane's left-hand horizontal stabilizer. The white marks were situated in the middle of the horizontal stabilizer and the black marks close to the tip.



*Figure 2: marks on leading edge and lower surface of left-hand horizontal stabilizer.
(source: BEA)*

The main damage observed on the parachute was the following:

- the textile loop securing the 3-ring system⁵ of the right-hand riser group was severed;



*Figure 3: view of the left (bottom) and right (top) risers with the broken textile loop
(source: BEA)*

⁵ The 3-ring system connects the riser groups to the harness bag. This system also allows the skydiver, in the event of an incident, to release the main canopy from the parachute harness and deploy the reserve canopy without risk of interference between the two canopies.

- the white reserve canopy showed rub marks (transfer of black colour from the leading edge of the left-hand horizontal stabilizer of the aeroplane), burns and tears on its leading edge and right-hand tip.



*Figure 4: damage to leading edge and right-hand tip of reserve canopy
(source: BEA)*

The main canopy and its deployment bag, as well as the pilot chute and its extraction line, showed no visible damage.

The pilot chute pouch located under the parachute showed no anomalies and was in satisfactory condition.



Figure 5: position of pilot chute storage pouch on a parachute of the same type (source: BEA)



Figure 6: pilot chute and its leather ball (source: BEA)

The pilot chute handle generally consists of a piece of plastic tube or a plastic or leather ball. Most skydivers prefer a leather ball because it offers better grip and is not so fragile as a plastic ball. However, when it comes into contact with a surface, leather slides less easily with the risk of partially dragging the pilot chute out of its pouch.

2.2 Aircraft information

F-HPVC is a Cessna C208 Caravan which belongs to the École de Parachutisme Sportif de Vannes Bretagne. It is equipped with a Pratt and Whitney PT6A-42A turbine engine. The aeroplane had logged approximately 7,700 flight hours at the time of the incident.

The aeroplane is configured for skydiving. It can carry up to 15 skydivers. Two benches can seat five and seven skydivers. The other skydivers sit on the floor of the aeroplane between the two benches and on the floor next to the aft door.



Figure 7: layout inside the airframe in skydiving activity configuration
(source: BEA)

2.3 Organisation of jump and positioning of skydivers on-board aircraft information

On the day of the accident, the distribution of the skydivers in the aeroplane (see figure below) and the planned jump order were as follows:

- 1st series at height of 1,200 m
 - three experienced skydivers (PA1 to PA3) to practice precision landing,
 - two students OA1 and OA2 (automatic deployment of the parachute) under the supervision of a skydiver instructor in charge of the students' jump,
- 2nd series at a height of 4,000 m for the eight other skydivers and the instructor.

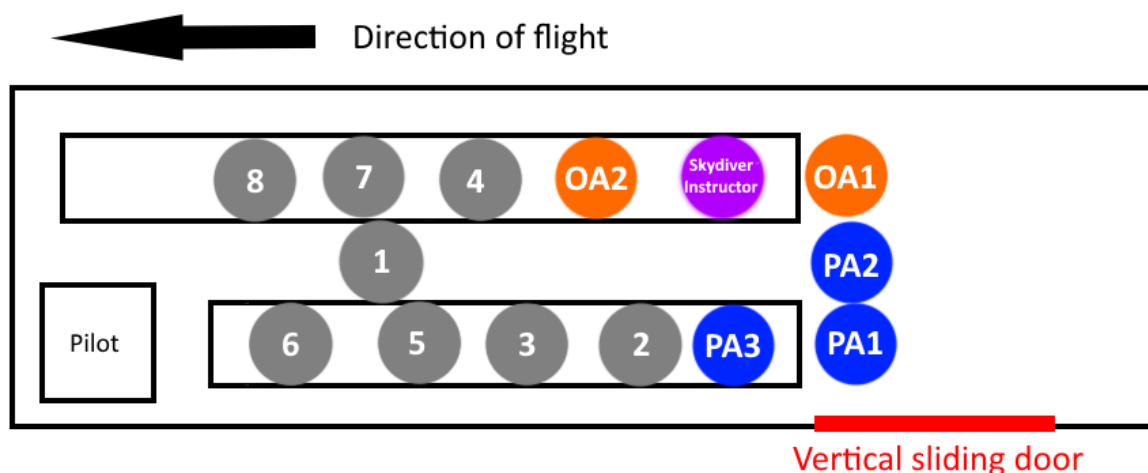


Figure 8: position of skydivers on board the aeroplane (source: BEA)

All the skydivers on board the aeroplane were seated with their backs to the direction of flight. Given the width of the aeroplane, the three skydivers seated side by side on the floor of the aeroplane are generally seated shoulder to shoulder, depending on their size.

In a skydiving session, while climbing, before reaching the jump altitude, the skydivers check⁶ their equipment. In the case of students, this check is carried out by a skydiver instructor. This verification consists of checking:

- the harness is properly locked and tightened (at the front);
- the handles are correctly positioned in their housings (at the front);
- the position of the needles or ripcord closing the two compartments of the two canopies (main and reserve) (at the rear);
- in the case of an automatic deployment jump, the correct attachment of the static line and its route.

The skydiver instructor may have to move around in order to carry out the various checks on the parachutes.

During a skydiving activity, equipment checks are carried out on the ground before boarding and again during the climb before reaching the jump altitude. Certain components, such as the main canopy deployment handle, the reserve canopy deployment handle, and the main canopy cutaway handle, are susceptible to unexpected snagging or friction, which can cause them to become partially or completely dislodged from their housings, even with minimal movement of a few centimetres. In addition to standard checks, it is good practice to check the position of the handles when there has been movement in the aeroplane and before approaching the aeroplane door to jump.

2.4 Parachute information

The parachute was composed of:

- a Javelin Odyssey J7NK harness (serial number 45679) certified for a maximum weight of 136 kg and manufactured in 2017;
- a Performance Designs – PD-Reserve 143 reserve parachute (serial number PR143-056998) certified for a maximum weight of 115 kg and manufactured in 2017;
- a Performance Designs – Zero 285 main canopy (ZE285-000645) manufactured in 2017;
- a VIGIL 2+ automatic activation device (serial number 51107) manufactured in November 2016 and valid until November 2026 (date of next inspection).

The main canopy is deployed by the skydiver during the freefall phase using a pilot chute stored in an elastic fabric pouch located under the parachute, which opens on the right-hand side. The skydiver extracts the pilot chute from the pouch and places it in the relative wind⁷. The chute inflates and, via an extraction line, opens the parachute compartment containing the main canopy. The chute then extracts the deployment bag in which the main canopy is folded, releases the suspension lines, and pulls the main canopy out of the container, which deploys once exposed to the relative wind.

The annual parachute inspection was carried out on 4 April 2024, and the reserve canopy was folded by a certified packer. The parachute had been declared worthy for use until 4 April 2025. No anomalies or restrictions had been noted during this inspection.

⁶ In addition to the equipment verification already carried out on the ground before boarding the aeroplane.

⁷ Wind experienced by an object (or person) in motion and observed in relation to that object (or person).

2.5 Experience

2.5.1 Pilot

The 56-year-old pilot held an aeroplane commercial pilot licence (CPL(A)) obtained in 2005 and a class 1 medical fitness certificate valid until 30 September 2024. He held SEP (single-engine piston) and SET (single-engine turbine) ratings on the Pilatus PC6 and the Cessna 208. He had logged 6,600 flight hours, including 5,500 hours as skydiving activity pilot.

2.5.2 Skydiver ejected from aeroplane (PA1)

The 46-year-old skydiver held C and D licenses⁸ as well as a federal instructor rating. He held a medical fitness certificate for skydiving and had logged 3,600 jumps.

The skydiver suffered a fractured tibia upon contact with the aeroplane structure and fractures to five lumbar vertebrae upon landing.

2.5.3 Skydiver instructor responsible for student jumps

The 40-year-old skydiver held C and D licenses. He was in training to obtain the federal instructor rating. He held a medical fitness certificate for skydiving and had logged 3,900 jumps.

2.6 Regulatory framework and risk management

The skydiving school, École de Parachutisme Sportif de Vannes Bretagne (EPSVB) is a non-profit association under the French law of 1901. The operation of the aeroplane complied with the requirements of Commission Regulation (EU) No 965/2012, known as “AIR OPS”⁹ Part NCO, in particular with regard to specific procedures related to skydiving activities and the associated identified risks (requirement NCO.SPEC.PAR.100).

The skydiving school also has a document for assessing and managing safety risks in skydiving activities (requirement NCO.SPEC.105(a)).

These specific procedures are described in the document, Pilot Checklist NCO.SPEC. PAR.100 Skydiving Operations in the Cessna C208 No 208-00247 F-HVPC drawn up by the school. The normal procedures in Part A of this document, paragraph 14, concerning the configuration of the aeroplane for skydiving, deal with measures taken to reduce identified risks.

The role of skydivers¹⁰ is defined in Part E: crew responsibilities, paragraph 3: Task specialist, and is the subject of a circular containing safety instructions for skydivers in an aeroplane.

In the absence of any previous occurrences, the risk of untimely opening of the canopy when the skydiving door was partially open during the climb had not been identified.

⁸ Licenses certifying a skydiver's autonomy, ability to supervise other skydivers, and perform demonstration jumps.

⁹ Commission Regulation of 5 October 2012 laying down technical requirements and administrative procedures related to air operations ([Version in force on the day of the accident](#)).

¹⁰ The AIR OPS regulations specify that skydivers have the status of task specialists.

The procedure for partially opening the door during the climb, required, as for opening the door before jumping, the pilot's approval. This task was assigned to an experienced skydiver who had attended a briefing to learn about the specific features and precautions to be taken when operating the door.

2.7 Summary of statements

The aeroplane pilot indicated that as it was hot on the ground (between 28°C and 30°C) at that time of the day, the skydivers had got into the habit¹¹ of partially opening the vertical sliding door while the aeroplane was flying to create a flow of fresh air inside the airframe. He explained that he heard a loud noise at around 2,000 ft as the aeroplane was climbing at full power. He simultaneously felt strong vibrations on the stick. He stated that he thought it was a mechanical failure of the elevator, reduced power and started to descend. He added that the vibrations disappeared and that as a precautionary measure, he decided to land. He explained that he learnt that a skydiver had been ejected from the aeroplane in flight once he arrived at the parking stand. He immediately alerted the control services in order to activate search operations for the skydiver. He specified that the skydiver was quickly found by the rescue services.

The skydiver in position PA3 (see **Figure 8**), sat just behind¹² the skydiver that was ejected (PA1), indicated that he heard a noise from the door. He turned his eyes towards the door and saw the pilot chute of the skydiver (PA1) sat in front of him fly out of the aeroplane. He then looked at the parachute and saw that the main canopy container was open and that the bag containing the main canopy was being dragged outside. He tried to hold it back by the suspension lines but the load was too high, forcing him to let go. He indicated that he saw the skydiver being pulled towards the rear of the aeroplane and then through the vertical sliding door. He then saw that the skydiver was under the reserve canopy with the main canopy still partially connected to the harness by the left-hand riser. He specified that he did not think of informing the pilot of what had happened as, perceiving that the aeroplane was in descent, he supposed that the pilot was aware of the situation.

The skydiver instructor, responsible for the student jumps, indicated that during the climb, after the door had been partially opened, he checked the parachutes of the two students with automatic activation OA1 and OA2 who were to jump at 1,200 m. He stated that in order to check the parachute of the first student OA1, skydivers PA1 and PA2 sat on the right-hand side of this student moved a few centimetres (towards the door) in order to give him some room. He added that he saw the skydiver being ejected from the aeroplane without being able to give precise details about the sequence.

The skydiver who was ejected from the aeroplane indicated that at a height of 450 m, he partially opened the door of the aeroplane as had been agreed with the pilot before boarding, as it was very hot. He raised the door approximately ten centimetres and then positioned his foot to act as a door stop. He specified that he checked the position of the pilot chute in its pouch before and after partially opening the door and that he had not noted any anomaly.

¹¹ This action had been authorized by the pilots before the first flight of the day.

¹² In this statement, in front/behind should be understood as with respect to the skydivers sat with their backs to the direction of flight.

He added that when the instructor started checking his students, the skydiver on his left-hand side moved and pressed against him. He specified that even though he had not moved, he had moved his chest (turning and leaning).

He indicated that he was quickly pulled towards the rear of the aeroplane due to the load exerted by the canopy deployed outside the aircraft and was then ejected. He added that on passing over the sill of the door, he struck the aeroplane structure¹³ and felt a sharp pain in his leg. Once outside the aeroplane, he observed that the reserve canopy was deployed and that the main canopy was still partially connected to the harness. He kept the two canopies away from each other (so that they would not get tangled together) down to the ground where he landed.

The head of the skydiving centre indicated that partially opening the door during the climb outside the parachute drop phases was a common practice when the ground temperature was high (summer period) in order to ventilate and cool down the air inside the aeroplane. As the aeroplane was certified with the “skydiver kit” supplement to fly with the door open, there was no restriction to opening the door in flight. However, during the take-off phases (at a flight height of less than 500 m), the door must be closed in order to prevent occupants from falling out at a height that is too low for remedial action.

3 CONCLUSIONS

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

Scenario

During the climb, after the door had been partially opened, the skydiver instructor started checking the equipment of the two students who were to be dropped when passing 1,200 m for the first time. The skydiver sat in the middle, on the right-hand side of the first student, moved to the right-hand side and was then touching the skydiver sat next to the partially-open door. The latter, although he had not moved to one side, had moved his chest by bending sideways and turning.

During these chest movements, as the parachute harness is a close fit, the parachute had followed these actions. The leather ball of the pilot chute of the skydiver sat next to the door was probably squashed between the floor of the aeroplane and the parachute. This rubbing against the aeroplane floor probably led to the pilot chute partially coming out of its housing. The airflow then caused it to completely come out of its housing and dragged it to the outside of the aeroplane, thus activating the deployment sequence of the main canopy.

As the skydiver was pulled to the rear, the right-hand riser caught on and deformed the skin of the aeroplane. On snagging, the system connecting the riser to the parachute was severed while the skydiver was pulled outside the aeroplane through the door. The separation of the riser caused the deployment of the reserve canopy which came into contact with the aeroplane’s left-hand horizontal stabilizer.

The ejected skydiver was, nevertheless, able to control his reserve canopy and land. The aeroplane pilot who have not perceived the situation but had observed an anomaly in the aeroplane’s behaviour, decided to return to and land on the aerodrome.

¹³ The skydiver does not know what part of the aeroplane he touched.

Measures taken by the skydiving centre

Following this occurrence, the skydiving centre has prohibited the opening or partial opening of the door during the flight, outside of the drop phases.

The document, Pilot Checklist NCO.SPEC. PAR.100 and in particular the part relating to the task specialist and the management of the skydiving door was updated to show this measure.

Safety lessons

The untimely opening of a parachute at the door of an aeroplane in flight presents a major risk of the parachute canopy interfering with or snagging on the horizontal stabilizer or elevator which could lead to the total loss of control of the aeroplane. Although this risk had been identified and was the subject of specific procedures (position of skydiver at door of aeroplane, verification of material both on the ground and before the jump), the risk of the untimely opening of a parachute when the door was partially open during the climb had not been envisaged.

The orifice in the pouch allowing the pilot chute to be extracted from its housing is situated on the right-hand side of the parachute. The position of a skydiver in line with the aeroplane door and according to the direction in which they are sat and the side on which the aeroplane door is situated, may directly expose the pilot chute to the airflow generated by the partially open door. The risk of an undesirable occurrence is thus increased.

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