



Accident to the Sonaca S201
registered **F-HMRZ**
on 28 February 2023
at Tours-Val de Loire (Indre-et-Loire)

Time	Around 17:45 ¹
Operator	Mermoz Academy
Type of flight	Instruction
Persons on board	Student-pilot
Consequences and damage	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.

Bounced landing, nose gear failure, in solo instruction

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on statements, radio-communication recordings and data from the onboard GNSS equipment.

The student-pilot took off from runway 02 at approximately 17:30 for her second solo flight, after 45 minutes of flight with the instructor who had signed her off for solo flights two weeks earlier. The purpose was to make two runway circuits. On final, the AFIS agent called out a wind from 040° of 8 kt, with gusts up to 16 kt.

On final during the second and final circuit, in landing configuration, the approach speed was relatively stable, around 62 kt. As she crossed the threshold of runway 02, the student-pilot felt a gust that caused the aeroplane to adopt a bank angle. She brought the aeroplane back to the runway centreline. At the same time, the aeroplane passed below the approach slope. The aeroplane's speed was around 58 kt and its attitude gradually increased to 2°. Upon contact with the runway, the aeroplane made a first bounce, with a height estimated by the AFIS agent to be approximately 1 m. After this contact with the runway, the aeroplane then made a second bounce, with a height estimated to be approximately 2 m and a load factor of 2.25 g. The aeroplane came to a stop on the runway centreline approximately 260 m after the aiming point markings, with the nose gear folded (see **Figure 1**).

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



Figure 1: aeroplane's position (source: airport operator)

2 ADDITIONAL INFORMATION

2.1 Student-pilot information

The student-pilot was undergoing modular practical training to obtain the Private Pilot Licence - Aeroplanes (PPL(A)) and the Airline Transport Pilot Licence - Aeroplanes (ATPL(A)).

Experience	
Total	17 hours and 25 minutes, 47 minutes of which as pilot-in-command
In the previous 90 days	14 hours and 30 minutes, 47 minutes of which as pilot-in-command
In the previous 30 days	8 hours, 47 minutes of which as pilot-in-command
In the previous 24 hours	1 hour

The student-pilot indicated that she maintained an approach speed of approximately 62 kt to take the wind into account. At low height, she felt a gust of wind that pushed the aeroplane off-centre. She explained that she brought the aeroplane back to the runway centreline. She considered that the destabilisation in the vertical plane she experienced at low height may have led to the first (slight) bounce, then to a second bounce before three-point contact was made. The student-pilot did not remember how she dealt with the bounce. She remembered that in the simulator, an instructor told her not to move the stick forward.

The student-pilot indicated that when she lands on board the S201, she usually targets the aiming point markings first. Then when she feels close enough to the runway, she usually reduces the power before applying a nose-up input on the stick. She then looks towards the end of the runway.

2.2 Instructor information

The instructor had signed the student-pilot off to fly solo two weeks earlier. He was present at the control tower for her first solo flight. He was not at the control tower for her second solo flight, but he indicated that he was monitoring the radio frequency.

He specified that he had flown with her before approving her for solo flights and that she had a good flare management technique. He therefore felt confident in her ability.

He added that the maximum crosswind on landing for student-pilots is 12 kt.

2.3 Aerodrome information

Tours-Val de Loire airport has a paved runway measuring 2,404 m long and 45 m wide. The landing distance available on runway 02 is 2,404 m. In its section describing specific conditions, the VAC chart indicates that the airport's maximum crosswind component (derived from the average wind) is 25 kt on dry runway and 20 kt on wet runway.

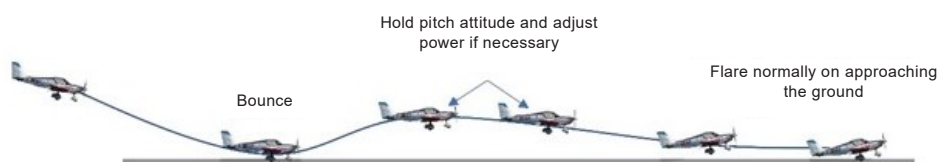
The AFIS information was made available on the afternoon of 28 February.

2.4 Aeroplane information

The approach speed with no wind to be maintained in landing configuration during the final approach (reference speed VREF) is 55 kt. The Operations Manual available to Mermoz Academy student-pilots indicates that the approach speed may be increased by 5 kt for wind speeds between 10 and 20 kt (including gusts).

For landing, the manual specifies that the power must be reduced as the aeroplane approaches the ground. Then the pilot must pull on the stick to gradually increase the attitude and align the nose of the aeroplane with the end of the runway. As the aeroplane decelerates, the pilot must maintain the nose-up input to maintain the attitude. The manual recommends that pilots look into the distance from the start of the flare to wheel touchdown. In the event of a crosswind, the manual describes the de-crab technique, which consists in reducing the drift with the rudder pedals and in making an input on the stick to bank the aeroplane into the wind.

The Mermoz Academy Operations Manual provides the following information in the event of a bounce on landing (see **Figure 2**):



*Figure 2: piloting technique in the event of a bounce
(source: Mermoz Academy Operations Manual, annotated by the BEA)*

The manual clarifies that bouncing can be explained by the following reasons:

- insufficient flare;
- touchdown on the nose gear only;
- touchdown with excessive speed;
- excessive nose-up input;
- starting the flare too high.

It also describes the possible effects of bouncing (see **Figure 3**).

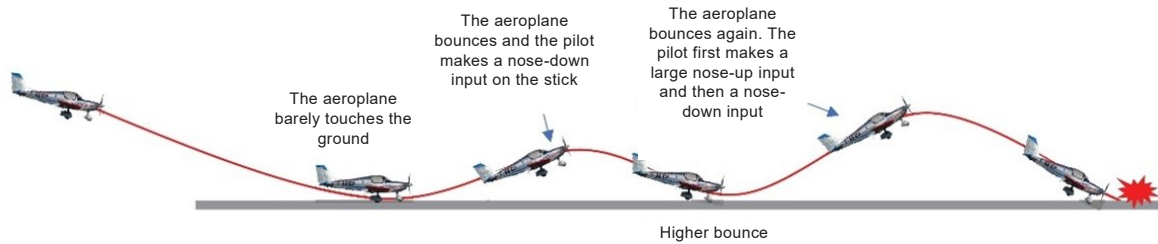


Figure 3: effects of bouncing

(source: Mermoz Academy Operations Manual, annotated by the BEA)

The manual specifies that a pilot with little experience must go around in the event of a bounce on landing.

3 CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.

Scenario

On short final, a gust of wind destabilised the aeroplane's flight path. The student-pilot corrected it by bringing the aeroplane back to the runway centreline. Nevertheless, the aeroplane passed below the approach slope. The inputs made during the flare led to a first bounce on the runway. It is likely that inputs similar to those described in the Mermoz Academy Operations Manual (see **Figure 3**) caused a second bounce with a higher load factor. The last contact with the runway occurred with a level or slightly negative attitude.

Contributing factors

The following factors may have contributed to the bounced landing and to the nose gear failure:

- the absence of a go-around when the flight path was destabilised at low height, which can be explained by the student-pilot's lack of experience;
- a flare management made difficult due to the low-height destabilisation caused by a gust of wind.

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