FINAL REPORT

INCIDENT 2021/845

State Commission on Aircraft Accidents Investigation (PKBWL)

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FINAL REPORT

INCIDENT

OCCURRENCE NO – 2021/845

AIRCRAFT – Airplane, Diamond DA20-C1, SP-NDI

DATE AND PLACE OF OCCURENCE – 21 April 2021, EPDE

The Report is a document presenting the position of the State Commission on Aircraft Accidents Investigation concerning circumstances of the air occurrence, its causes and safety recommendations. The Report was drawn up on the basis of information available on the date of its completion.

The investigation may be reopened if new information becomes available or new investigation techniques are applied, which may affect the wording related to the causes, circumstances and safety recommendations contained in the Report.

Investigation into air the occurrence was carried out in accordance with the applicable international, European Union and domestic legal provisions for prevention purposes only. The investigation was carried out without application of the legal evidential procedure, applicable for proceedings of other authorities required to take action in connection with an air occurrence.

The Commission does not apportion blame or liability.

In accordance with Article 5 paragraph 6 of the Regulation (EU) No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation […] and Article 134 of the Act – Aviation Law, the wording used in this Report may not be considered as an indication of the guilty or responsible for the occurrence.

For the above reasons, any use of this Report for any purpose other than air accidents and incidents prevention can lead to wrong conclusions and interpretations.

This Report was drawn up in the Polish language. Other language versions may be drawn up for information purposes only.

WARSAW 2022

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Abbreviations

BKN	Cloud cover type, Broken sky (5/8-7/8)
EPDE	Dęblin Aerodrome ICAO code
ft	foot – unit of altitude
GRD	Air traffic control – ground
IFR	Instrument Flight Rules
kt	knot – unit of speed
RWY	Runway
SCT	Cloud cover type, Scattered sky (2/8-4/8)
TCU	Towering cumulus cloud
TWR	Air traffic control – tower
ULC	Polish Civil Aviation Authority
UTC	Universal Time Coordinated

General Information

Occurrence reference number:	**2021/845**			
Type of occurrence:	INCIDENT			
Date of occurrence:	21 April 2021			
Place of occurrence:	EPDE			
Type and model of aircraft:	Airplane, Diamond DA20-C1			
Aircraft registration marks:	SP-NDI			
Aircraft user/operator:	Akademickie Centrum Szkolenia Lotniczego LAW			
Aircraft Commander:	Student-pilot			
Number of victims/injuries:	Fatal	Serious	Minor	None
	-	-	-	1
Domestic and international authorities informed about the occurrence:	ULC, TSB Canada			
Investigator-in-charge:	Krzysztof Miłkowski			
Investigating authority:	State Commission of Aircraft Accidents Investigation (PKBWL)			
Accredited Representatives and their advisers:	Not appointed			
Document containing results:	FINAL REPORT			
Safety recommendations:	NONE			
Addressees of the recommendations:	Not applicable			
Date of completion of the investigation:	16.12.2022			

Synopsis

On 21 April 2021, during training for PPL(A), a student-pilot performed solo flights along the aerodrome traffic circuit under the supervision of a flight instructor. Around 12:38 hrs UTC, during landing, the student-pilot performed touch down on the nose wheel of the landing gear, which resulted in a bounced landing. The student-pilot reacted to the bounce by moving forward the control stick, which led to another bounce, the instructor ordered: "stop the stick" and "hold stick in place". The plane bounced off the runway a few more times and finally the student-pilot performed the go-around procedure. During climb, he reported intensive vibrations of the plane. The instructor ordered him to check the engine operating parameters and make a landing on a shortened circuit. After landing, the student-pilot informed about taxi problems. The instructor ordered to shut down the engine and wait on the taxiway. Then the instructor found that the propeller and nose landing gear strut were damaged.

The investigation was conducted by:

Krzysztof Miłkowski Investigator-in-charge (PKBWL).

Cause of the occurrence: Incorrect reaction to bounced landing.

Contributing factor: Tailwind during landing.

PKBWL has not proposed safety recommendations after the investigation.

1. FACTUAL INFORMATION

1.1. History of the flight

On the day of the occurrence, the student-pilot was planned to perform 14 flights in four series. In the first series it was planned to perform two enroute flights according to task III/2 of the PPL(A) Training Program with a flight instructor, in total time of 1,5 h. In the second, third and fourth series, a total of 12 solo flights along the aerodrome traffic circuit were planned, of which the first two flights according to task TS/2 were planned on the basis of the "Training Program for a different type or model of aircraft" in a total time of 20 minutes, then 10 solo flights (five circuit flights in a series) according to task I/9 on the basis of the “PPL (A) Training Program” in a total time of 1:40 h.

The student-pilot performed the first, second and third series of flights between 07:50 and 10:44 hrs UTC, making two enroute flights and seven solo circuit flights.

The fourth series of five circuit flights began at 12:11 hrs UTC and after completing 2 circuit flights, the student-pilot took off for the third flight. Around 12:38 hrs UTC, he landed on the nose wheel of the landing gear and bounced several times on the runway.

After several bounces, the student-pilot performed go-around procedure. During climb, he reported unstable engine operation and strong vibrations. The flight instructor ordered to check the engine parameters and perform a shortened circuit flight. During that phase, another instructor instructed the student-pilot to perform a low circuit flight. The landing was performed correctly on runway 30. After vacating the runway, the student-pilot reported problems with taxiing. The flight instructor ordered to stop taxiing and remain on the taxiway, and then went to that place. It was found that the propeller and nose landing gear were damaged. The student-pilot was not injured.

1.2. Injuries to persons

Injuries	Crew	Passengers	Others	Total
Fatal	**-**	**-**	**-**	**-**
Serious	**-**	**-**	**-**	**-**
Minor	**-**	**-**	**-**	**-**
None	**1**	**-**	**-**	**1**

1.3. Damage to aircraft

As a result of the occurrence the landing gear strut and damper and the aircraft propeller were damaged.

Fig. 1. Damaged propeller and nose landing gear [source: PKBWL]

Fig. 2. Damaged nose landing gear [source: PKBWL]

1.4. Other damage

None.

1.5. Personnel information (crew data)

Student-pilot, aged 22, Flight Time on 21 April 2021:

- Total Flight Time: 27:02 FH
- Accident Type Flight Time: 08:38 FH
- Accident Type Flight Time over the last 90 days: 07:17 FH

Theoretical Knowledge Exam valid until 31.08.2021.

Class II aero-medical certificate valid until 07.03.2024.

On 23 September 2019 the student-pilot started flight training for the PPL(A) on Cessna 152L aircraft. The training was carried out regularly until 11 October 2019. During that period, the student-pilot performed 70 flights in 15hrs and 20 minutes with an instructor and 3 solo flights within 18 minutes, and then began the implementation of task II. From 11 October 2019 to 27 March 2020, the student-pilot did not perform flights. Then, after approximately five-month break, on 27 March 2020, the flight training was resumed on the DA20-C1 aircraft and a different flight instructor was appointed. Due to the change of the aircraft type, the "Training Program for a different type or model of aircraft" was implemented.

On 27 March 2020, the student-pilot completed 1 flight according to exercise TS1 and 5 flights according to TS2 on the basis of "Training Program for a different type or model of aircraft".

From 27 March 2020 to 19 April 2021 the student-pilot had a break in flying. After more than a year break, on April 19, 2021, the flight training was resumed and a third instructor was appointed. Due to failure to complete the training for the DA20-C1 aircraft in the previous period, the " Training Program for a different type or model of aircraft " was re-implemented.

In the period from 23 September 2019 to 21 April 2021 the student-pilot was trained by three different instructors on two different types of aircraft and on the basis of two separate training programs.

From 19 to 21 April 2021 the student-pilot performed 21 flights with the instructor in a total time of 05:06 FH.

1.6. Aircraft information

Diamond DA20 is a light, general-purpose aircraft with two seats. The airplane is constructed in a composite low wing structure with a fixed-pitch two-bladed propeller. The aircraft has a three-point fixed landing gear with a nose wheel and a T-shaped tail. The cockpit has two side-by-side seats and is equipped with a double controls that allows the aircraft to be used for pilot training.

Table 1. DA-20-C1, SP-NDI registration marks aircraft data.

Type	DA20-C1
Manufacturer	Diamond Aircraft Industries - Canada
Registation marks	SP-NDI
Serial number	C0641
Date of manufacturing	2013
Engine	Continental IO 240, four-cylinder, four-stroke, fuel-injected, air-cooled, counter-cylinder flat engine. Direct propeller drive from the engine shaft. Displacement: 239.8 cu. in (3.9 liters) Shaft horse-power: 125 HP (93.2 kW) at 2800 rpm
Propeller	Two-blade fixed-pitch, Model MT 175 R 150-2Ca, Diameter 5 ft 8,9 in (1,752 m), S/N 12042
Registration certificate issue date	05.11.2018
Airworthiness certificate issue date:	28.10.2013
Total flight time until 21 April 2021:	3468,7 FH
Last maintenance date:	18.03.2021
Maintenance validity date:	17.07.2021
Airworthiness review certificate validity date:	23.10.2021

1.7. Meteorological information

From 12:32 hrs UTC, during the accident solo flight, information “D” was in force, which contained the following weather conditions:

- RWY in use: RWY30;
- Wind: direction - 260°, speed - 8 kt;
- cloud cover - 3-4/8 (SCT) with a base of 4000 ft with TCU clouds;
- cloud cover - 5-7/8 (BKN) with a base of 10000 ft;
- temperature and dew point 12/07°C,
- pressure was 1010 hPa.

Based on radio communication between the crews and TWR, the PKBWL determined, that between 12:10 hrs UTC and the time of the incident, the direction and speed of the wind was different than the forecast in the information "D”:

- 12:10 – wind 140°/5 kt, tailwind component of 4,7 kt;
- 12:14 – wind 150°/6 kt, tailwind component of 5,2 kt;
- 12:18 – wind 150°/5 kt, tailwind component of 4,3 kt;
- 12:21 – wind 140°/8 kt, tailwind component of 7,5 kt;

- 12:25 – wind 160°/9 kt, tailwind component of 6,9 kt;
- 12:32 – wind 140°/9 kt, tailwind component of 8,5 kt;
- 12:34 – wind 140°/9 kt, tailwind component of 8,5 kt;
- 12:36 – wind 140°/8 kt, tailwind component of 7,5 kt;
- 12:42 – wind 140°/6 kt, tailwind component of 5,6 kt;
- 12:43 – wind 160°/6 kt, tailwind component of 4,6 kt;

The tailwind could have affected the course of the occurrence.

1.8. Aids to navigation

Not used.

1.9. Communications

The plane was equipped with standard radio and navigation equipment.

During solo flights, the student-pilot maintained communication with Dęblin GRD, TWR and with the pilot-flight instructor supervising the solo flights from the ground.

1.10. Aerodrome information

EPDE, Dęblin;

Status - Military Unit Aerodrome;

Coordinates - N51°33'04" E21°52'31", RWY centre line: 12/30;

Elevation - 394 ft;

Permitted traffic - IFR/VFR;

RWY 12 -dimensions: 2500x60 m;

RWY 30 - dimensions: 2500x60 m;

Radio:

- ATIS - 140.350 MHz,
- Dęblin GRD - 121.750 MHz,
- Dęblin TWR - 122.750 MHz,
- Dęblin APP - 128.250 MHz.

1.11. Flight recorders

The airplane was not equipped with flight recorders.

1.12. Wreckage and impact information

As described in items 1.3.

1.13. Medical and pathological information

The student-pilot did not suffer any injuries.

1.14. Fire

Fire did not occur.

1.15. Survival aspects

The student-pilot had his seat belts fastened correctly, which protected him against injuries.

1.16. Tests and research

PKBWL secured the records of the aircraft and recordings from radio communication and the aerodrome CCTV cameras. The student-pilot, flight instructor and witnesses statements were collected. The photographic documentation of the aircraft was collected and the meteorological conditions were analysed.

1.17. Organizational and management information

The training organization had the required certificate for aviation training. The aviation training was carried out on the basis of the "PPL(A) Training Program" and the "Training Program for different type or model of the aircraft" approved by the Civil Aviation Authority.

1.18. Additional information

On 27 April 2022, the Draft Final Report was sent to the training organisation for comments. The organisation made one comment, which was included in the report.

1.19. Useful or effective investigation techniques

Standard investigation techniques were applied.

2. ANALYSIS

The student-pilot was planned to perform, 14 flights divided into four series on 21 April 2021.

The first series of the flights (two enroute flights) was performed by the student-pilot in accordance with the planned flight schedule between 07.50 and 09.20 hrs UTC.

The second series of flights was performed by the student-pilot between 09:50-10:08 by performing 2 independent circuit flights according to TS/2 task of the “Training Program for different type or model of the aircraft”. The instructor supervised the solo circuit flights, maintaining radio communication with the student-pilot, GRD and TWR.

The take off for the first circuit of the fourth series took place from RWY30 at 12:32 hrs UTC with tailwind with 8.5 kt speed. The first two circuits were performed correctly by the student-pilot. At around 12:36 hrs UTC in the third turn before landing, the student-pilot was cleared to perform touch&go on RWY30 and was informed about the current wind blowing from the direction of 140° at 8kt speed, with 7.5 kt tailwind component. Around 12:38 hrs UTC the plane touched down on the nose strut, which caused

a bounce. After the first bounce, the student-pilot reacted by moving the control stick forward, which led to consecutive bounces.

While the airplane was bouncing on the runway, the supervising instructor did not order the student-pilot to go-around, but said; "stop the control stick" and "hold the stick in place".

After five bounces, the student-pilot took off to for GO AROUND. During climb to the circuit altitude, at around 12:39 hrs UTC the student-pilot reported problems with the engine and intensive vibrations of the plane and problems with reading the engine parameters. At that time, another instructor, who had heard the communication, advised the student-pilot to perform a low circuit flight. Communication from another instructor disrupted the communication between the student-pilot and the supervising instructor. The student-pilot stated that he did not know who was communicating with him and whose instructions were to be carried out. The supervising instructor ordered the student-pilot to fly in accordance with the previous instructions and to control the engine and flight parameters. At approximately 12:4 hrs UTC in the third turn before landing, the student-pilot was cleared to land on RWY30. The landing that ended with a stop occurred around 12:43 hrs UTC. Then the plane vacated the RWY via taxiway "C", where the student-pilot reported a problems with taxiing. After arriving at the site, propeller and front landing gear damage was found by the Instructor.

The student-pilot did not suffer any injuries due to the occurrence.

The flight training of the student-pilot lasted from 23 September 2019 to 21 April 2021 on two different types of aircraft with three different instructors and according to two separate training programs. During that period, the student-pilot had two breaks in the flight training, the first lasting about 5 months and the second over twelve month.

During the incident flight, tailwind during landing could have an impact on the occurrence, as well as the lack of landing skills with tailwind and the inability to correct the error after the first bounce. The flight instructor supervising the student-pilot from the ground did not instruct the student-pilot to abort the task and to perform go-around procedure after the first bounce, but ordered to hold the control stick in place. The instructor did not analyse the weather conditions during the flights. TWR controller issued a clearance to perform take-offs and landings.

3. CONCLUSIONS

3.1. Findings

1) The aircraft was fit for flight, and its airworthiness and maintenance were properly documented.
2) No evidence of airframe or system failure prior to the occurrence was found.
3) The mass and center of gravity were within permissible range.
4) The student-pilot was not under the influence of alcohol.
5) The student-pilot did not have sufficient skills to perform a safe landing in tailwind conditions.
6) The student-pilot was not able to react properly to the first bounce of the aircraft.

7) The student-pilot had long breaks in flight training.
8) The flight training was carried out on two different types of aircraft.
9) Wind speed and direction during the flight were different from those given in the forecast prior to the flight.

3.2. Causes of the accident

Incorrect reaction to bounced landing.

3.3. Contributing factors

Tailwind during landing.

4. SAFETY RECOMMENDATIONS

PKBWL has not proposed any safety recommendation after completion of the investigation.

5. ANNEXES

None.

THE END

Investigator-in-Charge

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(Signature on original)