

## Synopsis



*Figure 1: The aircraft after the event*

Preparing for revalidation of her rating, the pilot (hereinafter: „Pilot”) and her flight instructor (hereinafter: „Flight Instructor”) were flying traffic patterns with touch-and-go’s. After the third touch-and-go, the Flight Instructor took over control for the purpose of a brief detour and then he carried out the landing as well. Descending continuously after the second turn from 3500 feet height, he reached the base leg of the traffic circuit with an engine power of 30%, and set idle only before the flare. Then the gear warning horn sounded, but no time was left to fully extend the landing gears anymore,

and the aircraft carried out belly landing. No one was injured in the event and the aircraft suffered repairable damage. The Investigating Committee of Transportation Safety Bureau, Hungary (hereinafter: “IC”) attributes the cause of the event to human factors. The IC identified no circumstance which would warrant the issuance of a safety recommendation.

## Factual information

<b>Occurrence category:</b>	Serious incident			
<b>Date of occurrence:</b>	24 January 2021, 15:35LT <sup>1</sup>			
<b>Location of occurrence:</b>	Tököl aerodrome (LHTL)			
<b>Aircraft model and registration:</b>	Diamond DA42 Twin Star, HA-DAJ			
<b>Year of manufacture, serial number:</b>	2006, S/N: 42.139			
<b>Type and number of engines:</b>	Twin-engine, Thielert TAE 125-02-99			
<b>Purpose of flight:</b>	Training flight			
<b>People</b>	<b>Number:</b>	<b>Crew</b> 2	<b>Passenger</b> 1	<b>Other</b> 0
	<b>Injured:</b>	0	0	0
<b>Damage to property:</b>	<b>Aircraft:</b> considerably damaged			
<b>Licence and ratings of Flight Instructor:</b>	PPL(A) <sup>2</sup> , IR(A) <sup>3</sup> , SEP(land) <sup>4</sup> , MEP(land) <sup>5</sup> , FI(A) <sup>6</sup>			
<b>Age and citizenship of Flight Instructor:</b>	64 years old, Hungarian			
<b>Flight experience of Flight Instructor</b>	<b>Total</b>	<b>On the type</b>	<b>Last 90 days</b>	<b>Last 7 days</b>
<b>Flying hours:</b>	6583 hours	70 hours	4 hours 45 minutes	2 hours 41 minutes

<sup>1</sup> Local Time

<sup>2</sup> Private Pilot Licence (Aeroplane)

<sup>3</sup> Instrument Rating (Aeroplane)

<sup>4</sup> Single Engine Piston (Land)

<sup>5</sup> Multi Engine Piston (Land)

<sup>6</sup> Flight Instructor (Aeroplane)

<b>Licence and ratings of Pilot:</b>	PPL(A), IR(A), Night (A) <sup>7</sup> , SEP(land), MEP(land)			
<b>Age and citizenship of pilot:</b>	37 years old, Dutch			
<b>Flight experience of PIC:</b>	<b>Total</b>	<b>On the type</b>	<b>Last 90 days</b>	<b>Last 7 days</b>
<b>Flying hours:</b>	268 hours	N/A	N/A	1 hour 26 minutes
<b>Sources of information:</b>	Notification, site survey, witness interviews, radar data			

### Flight summary

On 24 January 2021, in the afternoon, the Pilot and the Flight Instructor were flying traffic patterns with touch-and-go's on RWY 32 at Tököl aerodrome (LHTL). On the day before the event, the Pilot successfully completed the check flight needed due to a longer break, but she thought she needed more practice to revalidate her ME(IR)<sup>8</sup> rating due on the day after. A novice student pilot of the Flight Instructor occupied one of the back seats of the 4-seated aircraft. According to the Pilot, she did all of the checklist items during her flight. After the third touch-and-go, the Flight Instructor found that the Pilot had successfully corrected her earlier mistakes, and asked the Pilot to let him take over control in order to check the cloud base which was at 3500 feet. Following the takeover, the Flight Instructor left the traffic pattern westward, and after checking the cloud base, he made a radio call about his intention to land then rejoin the base leg of RWY 32 (Figure 2).

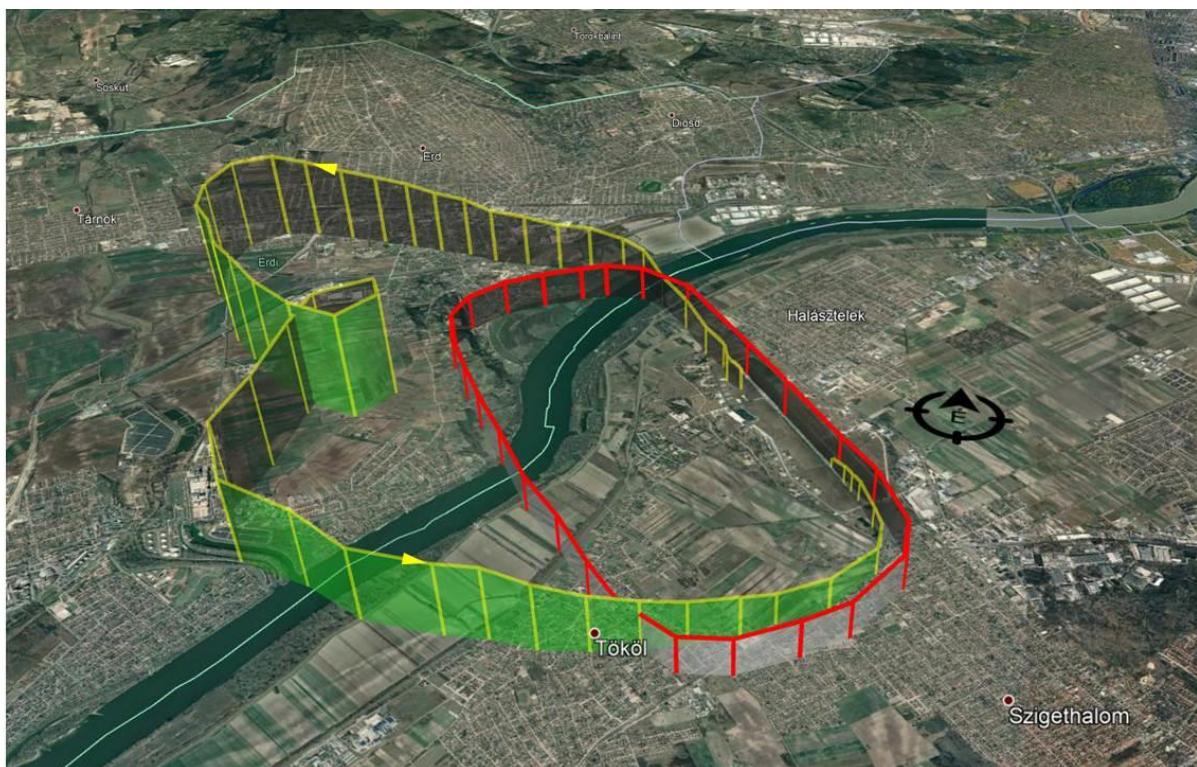


Figure 2: Flight track of the HA-DAJ

According to the Flight Instructor, he usually radios his further intent at 1700 feet, before base leg and at the same time he extends the landing gear as well. But that time he intended to reach the runway by continuous descent from cloud base. He set the flaps to the usual *approach* position but, because of the relatively long final, he reduced thrust to 30% only. The required checklist items were not done before landing. According to the Flight Instructor, he did not usually follow the required checklist. On base leg, the Flight Instructor set the flaps to the *landing* position. On final of RWY 32, he set 30% thrust and he was not carried out the 'final check' items either. The Flight Instructor reduced thrust just before the flare, as a result of which the landing gear warning horn sounded, but he thought it was the stall-

<sup>7</sup> Night (Aeroplane)

<sup>8</sup> Multi Engine (Instrument Rating)

speed warning. During flare, the Flight Instructor suddenly realised the gear's up position and he started to extend the landing gear reflexively, but then aborted the process deliberately, because full extension was not possible anymore. Accordingly, the aircraft touched down with its steps and engine cowls, and skidded on those and the partly extended nose landing gear until it halted.

### Site and Wreckage

After the touch-down, the aircraft skidded ca. 250 metres on the concrete runway. As a consequence, the lower plates of the engine cowls got damaged, the propellers and the steps were destroyed, and the exhaust pipe got damaged, as well as the flaps (the latter to a small extent only).

### Flight Crew

The aircraft was flying by the Pilot and then by the Flight Instructor. Both of them had the required licences and ratings for flying the aircraft and their documents were valid at the time of the event.

The Pilot had less, while the Flight Instructor had extended flight experience, although he logged 70 hours on DA42.

### Aircraft

The Diamond DA42 Twin Star is a low-winged, four seat twin-engine aircraft with Diesel engines, with Full Authority Digital Engine Control (FADEC<sup>9</sup>) and equipped with retractable landing gear. Its flaps can be extended in two stages: approach and landing. Take-off is carried out with the flaps retracted.

Conditions of the activation of the gear warning horn:

- flaps are in the landing position,
- thrust of at least one of the engines is below 20%.

According to the Flight Manual, the following checklists must be carried out during approach and before landing:

#### DESCENT / APPROACH CHECK

1. Landing data.....RECEIVED
2. Altimeters (3)..... SET
3. COM / NAV / FMS.....SET
4. Seatbelts.....FASTENED
5. Fuel selectors (2).....CHECKED ON
6. Parking brake.....CHECKED RELEASED
7. Gear warning horn.....CHECKED

#### FINAL CHECK

1. Flaps.....LDG
1. Gear.....3 GREENS CHECKED

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<sup>9</sup> Full Authority Digital Engine Control

## **Aerodrome**

Tököl Aerodrome is north of Tököl town. Its elevation (above sea level) is 100 m / 328 feet. It has a concrete runway (orientation: 14/32) and a grass airstrip parallel to and north of the concrete runway. The dimensions of the concrete runway (taking into account the relocated runway thresholds) are 799 m (length) by 60 m (width), while the grass airstrip is sized 1100 m by 50 m. The traffic pattern is 14 RH or 32 LH, altitude above sea level is 1700 feet.

## **Malfunctioned Equipment**

No information emerged during the investigation on malfunction of the structure or any system of the aircraft prior to the occurrence, thus contributing to the occurrence or influencing the course of events.

## **Maintenance**

According to information available to the IC, the aircraft was in properly maintained and airworthy state before the event.

## **Weather and Visibility**

At the time concerned, the sky was moderately cloudy and there was no rain at the scene of the event. There was a moderate northwest wind (from 320°).

## **Organisations**

The training organisation concerned uses the aircraft concerned exclusively for training and practice flights with a flight instructor. The aircraft cannot be used without a flight instructor of the organisation. Other characteristics of the organisations had no effect on the event therefore need no discussion in detail.

## Analysis

The IC found no acceptable reason why the Flight Instructor had taken over control of the aircraft during the practice flight when the circumstances did not require so, and the Pilot performing practice flight did not ask him either. The IC assumes that otherwise the Pilot would have landed uneventfully, following the procedure as earlier.

The Flight Instructor tended to fly as a matter of routine instead of observing the instructions of the Flight Manual. During the flight leading to the event, he did not compose the descent and the landing in the way usual to him (following the traffic pattern). As a result, the radio communication was omitted before base, as well as the extension of the landing gear usually related to it.

The elements of the 'DESCENT / APPROACH CHECK' items prior to commencing the descent were not carried out. The checklist includes also the checking of the gear warning horn which may remind the pilot to extend the landing gears.

By keeping the engine thrust above 20% during the approach till the flare, the Flight Instructor prevented the activation of the gear warning horn. Although not deliberately, but he disabled one of the safety elements of a multiple protection system by doing so. Other elements of the protection are the green or red landing gear position lights and the required checklist. While carrying out the 'FINAL CHECK' items, the pilot must check the three green lights which indicate the extended position of the landing gear, i.e., if they have not extended the landing gear yet, they still have a chance to do so. In this case, however, the Flight Instructor did not fully carry out the items of the 'FINAL CHECK' either.

## Conclusions

It is known from the Flight Instructor that he does not use the required checklists during flights. The IC supposes that this routine-based error based on the Flight Instructor's overconfidence due to his extensive flight experience. Prior landing, the Flight Instructor deviated from his usual approach procedure, therefore he missed to extend the landing gear.

In the IC's opinion, the following factor also contributed to the event:

- The engine thrust was over 20% till the flare during the approach and the landing therefore the gear warning horn was not activated.

Instinctive landing gear extension, which could have caused more damage was immediately reversed, therefore no further damage occurred. The serious incident could have been avoided by observing the requirements therefore the IC finds it unnecessary to issue a safety recommendation.

Gábor Torvaji  
Investigator-in-Charge

Miklós Ferenci  
IC Member

The sole objective of the safety investigation is to reveal the causes and circumstances of aviation accidents or incidents and to initiate the necessary safety measures, as well as make recommendations in order to prevent similar events in the future. Safety investigations shall not be conducted to apportion blame or liability by any means.

### General information

**This investigation is being carried out by Transportation Safety Bureau on the basis of the following.**

- Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC,
- Act XCVII of 1995 on aviation,
- Annex 13 identified in the Appendix of Act XLVI. of 2007 on the declaration of the annexes to the Convention on International Civil Aviation signed in Chicago on 7<sup>th</sup> December 1944,
- Act CLXXXIV of 2005 on the safety investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbv.),
- NFM Regulation 70/2015 (XII.1) on safety investigation of aviation accidents and incidents, as well as on detailed investigation for operators,

In the absence of other relevant regulation in the Kbv., in accordance with Act CL of 2016 on General Public Administration Procedures.

The competence of the Transportation Safety Bureau of Hungary is based on Government Regulation № 230/2016. (VII.29.) on the assignment of a transportation safety body and on the dissolution of Transportation Safety Bureau with legal succession.

**Pursuant to the aforesaid legislation,**

- Transportation Safety Bureau Hungary shall investigate aviation accidents and serious incidents.
- Transportation Safety Bureau Hungary may investigate aviation and incidents which – in its judgement – could have led to more accidents with more serious consequences in other circumstances.
- Transportation Safety Bureau Hungary is independent of any person or entity which may have interests conflicting with the tasks of the investigating body.
- In addition to the aforementioned laws, the ICAO Doc 9756 and the ICAO DOC 6920 Manual of Aircraft Accident Investigation are also applicable.
- This Report shall not be binding, nor shall an appeal be lodged against it.
- The original of this report was written in the Hungarian language.

Members of the IC are in no conflict of interest. Persons participating in the safety investigation do not act as experts in other procedures concerning the same case and shall not do so in the future.

The IC shall retain the data and information obtained in the course of safety investigations. Furthermore, the IC shall not disclose for other authorities such data and information, whose holder would have been legally entitled to withhold them.

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### Translation

The present document is a translation from Hungarian. Although efforts have been made to provide a translation as accurate as possible, discrepancies may occur. In such eventuality, the Hungarian version is considered overriding.