

## Synopsis

The foreign national pilot completed her flight training in the scope of a pilot training program provided by a Hungarian training organisation. Upon getting certified she was performing a solo flight at Esztergom airfield, which ended in a botched landing during which the nose gear separated from the fuselage and the aircraft came to a halt on its nose on the turf strip. No personal injury ensued. The Investigating Committee of Transportation Safety Bureau (further on referred to as IC) have attributed the event to human factors as detailed in the following. While on short final the pilot released the control stick to be able to operate the flap handle with both hands, the untightened friction knob allowed the throttle lever to creep forward and the engine revved up. The unexpected change in flight parameters and the subsequent deviation from the glide path confused the pilot who got distracted from her usual routine approach procedures. The rapid succession of unforeseen events quickly saturated her mentally and narrowed her focus on forcing touchdown without considering alternative options. Commitment on landing in this mental overload situation led to a hot approach followed by a bulked landing and a crash.

## Factual information

|  |  |                      |                     |                    |
|--|--|----------------------|---------------------|--------------------|
| <b>Occurrence category:</b>                | Accident   |                      |                     |                    |
| <b>Date of occurrence:</b>                 | 7 December 2018, 10:11LT <sup>1</sup>  |                      |                     |                    |
| <b>Location of occurrence:</b>             | Esztergom airfield (LHEM)  |                      |                     |                    |
| <b>Aircraft model and registration:</b>    | AT-3R100, HA-BHL   |                      |                     |                    |
| <b>Year of manufacture, serial number:</b> | 2017, AT3-081  |                      |                     |                    |
| <b>Type and number of engine(s):</b>       | Single, Rotax 912 S2   |                      |                     |                    |
| <b>Purpose of flight:</b>                  | Non-commercial (private, local)  |                      |                     |                    |
|  | <b>Crew</b>  |                      |                     |                    |
| <b>Persons</b>                             | <b>Number:</b>   | 1                    |                     |                    |
|  | <b>Injured:</b>  | none                 |                     |                    |
| <b>Damage to property:</b>                 | <b>Aircraft:</b> substantially damaged<br><b>3<sup>rd</sup> party:</b> no damage           |                      |                     |                    |
| <b>Licence and ratings of PIC:</b>         | PPL(A) <sup>2</sup> , SEP (Land) <sup>3</sup> , LPE LEVEL <sup>4</sup> ,                   |                      |                     |                    |
| <b>Age and citizenship of PIC:</b>         | 28, Turkish  |                      |                     |                    |
| <b>Flight experience of PIC:</b>           | <b>Total</b>   | <b>In this model</b> | <b>Last 90 days</b> | <b>Last 7 days</b> |
|  | <b>Flight hours:</b>   | 62:38                | 6:54                | 14:48              |
| <b>Sources of information:</b>             | Report, on-site investigation, witness interviews, radar data, recorded engine parameters. |                      |                     |                    |

## Flight Summary

The pilot took off from the grass strip 20 at LHEM for a ca. 50-minute flight in the vicinity of the airfield at 3,000 feet AGL or thereabouts, to build hours. For flight reconstruction the IC relied on the aircraft's digitally recorded engine parameters along with flight radar data provided by local air traffic service. The take-off, climb and cruise sections of the flight were uneventful up until short approach, where the recorded engine parameters indicate a 16-second engine rev-up to 4,100 RPM. In her account the pilot reported that she had to let go of the yoke and throttle to be able to move the flap lever with both hands. Meanwhile, the unguarded throttle lever crept forward and the engine revved up to a regime that corresponds to cruise power setting, to which the pilot failed to react for as long as 16 seconds.

<sup>1</sup> Local Time

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

<sup>3</sup> Single Engine Piston (Land)

<sup>4</sup> Language Proficiency Examination, English, Level 4

After throttling back the engine ran for another 23 seconds at idle until it quit on impact, in which the nose gear separated and the propeller blades got damaged from ground contact. The aircraft came to a halt tipped on its nose as shown in *figure 1*.

### Site and Wreckage

The aircraft sustained substantial damage in the accident. The nose gear separated on impact, all three propeller blades got bent, the spinner and the cowling, as well as the engine mount were damaged. The aircraft came to a halt on the turf 260 metres past the 20 airstrip threshold.



*figure 1. The aircraft after the accident (HA-BHL)*

### Aircrew

The 28-year-old female pilot started her training flights in May 2018 within the scope of a training agreement she concluded with a Hungarian training organisation. She passed her CAA licence test in June 2018. During her training she logged 11:30 solo flight time while the rest of her flights was with a flight instructor. She held a valid Class 2 medical certificate at the time of the accident.

### Aircraft

The Polish design AT-3R100 model is an aluminium hull, low-wing, light two-seater, fixed tricycle gear single engine aircraft. The aircraft length is 6.15 metres with a wing span of 7.55 metres. Maximum take-off mass is 582 kg. The fuselage, wings and stabilizers are made of an aluminium alloy. Its elevator and ailerons are push rod operated and the rudder is cable controlled. The mechanically operated floor flap lever between the seats has a ratchet mechanism release knob on the tip.

The pilot sets the throttle lever's resistance by a friction knob at its pivot. Leaving the knob too loose may allow the throttle lever to move against the pilot's will.

The maximum 100 HP that the engine puts out at 5,800 RPM is limited for 5 minutes of continuous use. The maximum allowable continuous power is at 5,500 RPM.

### Aerodrome

Esztergom Airfield (LHEM), lying between the Daube and the western foot of the Visegrád Mountains at 111 metres AMSL<sup>5</sup>, is a Class IV, privately operated, non-public aerodrome. Its single, grass 1,000 by 30-meter airstrip is of 02/20 orientation. The IC inspected the accident aircraft's landing path and found nothing on the surface that alone could cause a nose gear separation.

### Visibility and Weather Conditions

High altitude cirriform coverage was constantly changing due to the volatile weather front situation on the day, which was still predominantly sunny throughout. Lowest reported night temperature was 1 to 6°C at night, averaging at 3°C during daytime. Wind was southerly at 6 kts, gusting 9 kts (170/3 m/s gusting 4.6 m/s).

### Flight Parameters and Flight Data Recorders

According to ATS<sup>6</sup> radar information, the flight was about 50 minutes long, carried out in the vicinity of Esztergom, more or less at 3,000 ft. above sea level. An integrated MVP-50 flight data recorder provided usable timeline data of engine RPM. These data reveal that the pilot was cruising at 4,000 to 4,200 RPM and commenced approach at 2,300 RPM. 39 seconds prior to touch-down the engine speed increased to 4,100, which was kept for 16 more seconds during a continued descent. At that point the pilot throttled back to reduce engine power to 2,200 to 2,300 RPM. The engine was running at this regime for another 23 seconds until it cut on ground impact.

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<sup>5</sup> Above Mean Sea Level

<sup>6</sup> Air Traffic Service

## Analysis

Late in the morning on 7 December 2018 the pilot started a southwesterly approach to Esztergom airfield's turf strip 20. While she was setting the flaps for landing the engine RPM started to increase to reach values corresponding to cruise power, as recorded by the FDR<sup>7</sup>.

In this aircraft model the pilot in the left hand seat has their throttle lever on the left side. In normal operation the pilot is supposed to handle the yoke with their right and guard the throttle with their left. For setting the flaps with their right they will change hands and steer with their left hand while leaving the throttle unguarded for this instant. This will also involve the prior tightening of the friction knob so the throttle lever will not move while left unguarded.

In her testimony the pilot stated that she needed both hands to set the flaps, as she was unable to do so with her right hand alone. She let go of the yoke and throttle lever, leaving both unguarded during this time. Meanwhile the throttle lever, whose friction knob she had failed to tighten, crept forward and the engine RPM started to climb. The increasing power and airspeed threw the aircraft out of trim, inducing a deviation from the approach path. The extending flaps further increased this deviation, which would have called for an immediate intervention by the pilot. She failed to react and cut the throttle, letting the engine run at 4,100 RPM for as long as 16 seconds, during which the aircraft covered as much as 575 meters or more in flight, with continuously building airspeed. The pilot got so much above the glide path that safe recovery became impossible, even by eventually throttling back and introducing a very steep nose down descent. According to FDR data, in the last segment of the approach the engine was running at 4,100 RPM for 16 seconds, followed by 23 seconds of hot and high approach at idle with the aircraft covering 1,400 metres altogether. In retrospect, the outcome could have somewhat been mitigated by using the few hundred meters of runway remaining ahead, but the adequate response to handle the situation must, by all means, have been to call off the approach and initiate a go-around.

## Conclusions

During approach, in one of the most critical phases of flight, the pilot failed for too long to react to the increasing engine power and the resulting change of flight parameters, which caused an escalating deviation from the approach path. As she most probably missed to promptly recognise the increasing RPM and the cause thereof, she got confused by the flight parameters slipping out of hand and the rapid succession of unexpected events quickly overwhelmed her. In this mental overload situation her level of experience did not allow her to properly prioritise and handle the problems in a timely and efficient manner, much less to consider alternative options such as going around. Her focus must have narrowed on aiming for her usual touchdown spot, in disregard both her excessive airspeed and too high altitude. The resulting crash is attributed to high airspeed at touchdown causing a bounce and a botched landing, which the pilot could not properly handle due to her low level of experience and the momentary saturation of her mental capacity. The IC attribute the causes of the accident to human factors and have found no grounds to issue a safety recommendation.



József Mezei  
Investigator-in-Charge



Ákos Hanczár  
Member of IC

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<sup>7</sup> Flight Data Recorder

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 and make recommendations in order to prevent similar cases in the future. Safety investigation is not aimed at apportioning blame or liability.

### General information

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

- 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 Kbt.),
- NFM <sup>8</sup> Regulation 70/2015 (XII.1) on safety investigation of aviation accidents and incidents, as well as on detailed investigation for operators,

In absence of other relevant regulation in the Kbt., 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 of Hungary shall investigate aviation accidents and serious incidents.
- Transportation Safety Bureau of Hungary may investigate aviation and incidents which – in its judgement – could have led to accidents of more severe consequences in different circumstances.
- Transportation Safety Bureau of 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 legislation, 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 have been in no conflict of interest. The persons participating in the safety investigation did not act as experts in other procedures concerning the same case and shall not do so in the future.

The IC shall retain all data having come to their knowledge in the course of the safety investigation. Furthermore, the IC shall not be obliged to make the data – regarding which the owner of the data could have refused its disclosure pursuant to the relevant act – available for other authorities.

#### 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 shall prevail.

<sup>8</sup> Ministry for National Development