

PRELIMINARY REPORT



ACCIDENT 2022/6240

State Commission on Aircraft Accident Investigation (SCAAI)

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PRELIMINARY REPORT

ACCIDENT

OCCURRENCE NO. – 2022/6240

AIRCRAFT – Glider MDM-1 „Fox”, SP-3828

DATE AND PLACE OF OCCURRENCE – 23 October 2022, EPRU



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. 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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GENERAL INFORMATION

Occurrence reference number:	2022/6240			
Type of occurrence:	ACCIDENT			
Data of occurrence:	23 October 2022			
Place of occurrence:	EPRU			
Aircraft:	Glider MDM-1 „Fox”			
Aircraft registration marks:	SP-3828			
Aircraft user/operator:	Aeroklub Częstochowski/Aeroclub of Poland			
Aircraft commander:	SPL/FI			
Number of victims/injuries:	Fatal	Serious	Minor	None
	2	0	0	1
Domestic and international authorities informed about the occurrence:	ULC, EASA, BMK Austria, AMIA Slovakia			
Investigator-in-Charge:	Michał Ombach			
Investigating Authority:	State Commission on Aircraft Accidents Investigation (SCAAI)			
Accredited Representatives and their advisers:	Not applicable			
Document containing results:	PRELIMINARY REPORT			
Safety recommendations:	None			
Addressees of the recommendations:	Not applicable			

FACTUAL INFORMATION

1. History of the flight

On 23 October 2022, at 10.00 hrs. LMT¹ on EPRU aerodrome the gliding activity began - initially with winch towing.

Then, about 1.5 hours later, preparations started for flights of the aerobatic MDM-1 "Fox" using a WT-9 "Dynamic" as a towing plane. The aim was to conduct a training program for the "aerobatics" entry to the license already hold by the trainee.

The towing pilot performed a pre-flight inspection, started up the engine and taxied the aircraft to the launch place. Then the pilot performed an engine check, stating (quote) "all parameters normal".

The task of the pilot was to tow the glider to 1200 m AGL (above ground level), to the virtual aerobatic box located on the north side of the aerodrome. After release, the glider crew was to begin their program, and the towing plane was to descend out of the aerobatic box.

At 11:22 hrs. the first towed flight was made – a trainee and his instructor were in the glider cockpit. The whole flight was normal and the landing took place 19 minutes after the take-off.

The second flight was the trainee solo flight to practice maneuvers demonstrated in the first flight. The flight coordinator pointed out that that flight was made "with great care and correctness".

The third flight was performed again with the instructor.

The take-offs list of the MDM-1 "Fox" on the accident day, is given in Table 1.

No.	Crew	Take-off time	Take-off landing	Flight time	Break time between take-offs
Take-off 1	Trained pilot + instructor	11:22	11:41	19	7 minutes
Take-off 2	Trained pilot (solo flight)	11:48	12:09	17	4 minutes
Take-off 3	Trained pilots + instructor	12:13	---	01²	Flight ended with the occurrence

¹ All times in Preliminary Report are in LMT, LMT=UTC+2 hr.

² The data given in accordance with the take-off list. In fact, that flight lasted about 2 minutes.

The take-off run for the third take-off [1] (Fig. 1) began at 12:13 hrs.

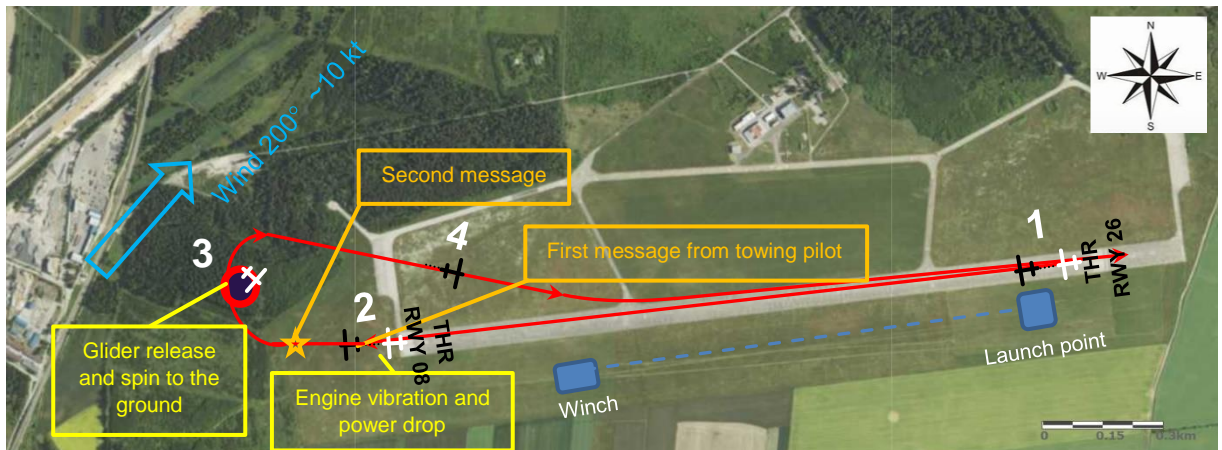


Fig. 1. Trajectory of the flight, place of the glider collision with the ground, approach and landing of the towing plane [source: SCAAI]

After a correct acceleration and lift-off, the climb was normal. About 80÷90 m AGL [2], after passing the threshold of RWY08, the plane "got into vibrations, began to shake" (quote from the statement of towing pilot). The pilot immediately informed via radio the glider crew (the first message): "Fox, I have got the problems with the engine!".

At the same time the pilot was checking parameters of the powerplant, making sure that the carburetor heating was turned off. The engine was losing power and the pilot had the impression that "the plane was getting stuck". The flight trajectory was still straight forward.

The towing pilot transmitted the second message, suggesting the glider crew releasing, if possible. At the same time, to turn back to the aerodrome, the pilot began a turn to the right (to the north). While turning the crew released the glider [3].

The towing pilot felt the release, he did not see the glider in the mirror and completed the turn to the aerodrome, then reduced engine power and landed "downwind" [4], stopping the aircraft near the threshold of RWY26, on the east side of the aerodrome.

After release, the glider entered the right spin, disappeared from witnesses view and collided with the ground.

The witnesses notified emergency services and reached the scene in about 3 minutes. The glider wreckage with both pilots in the cockpit was found in the forest (Fig. 2). The pilots showed no signs of life. Their deaths were confirmed by emergency services.



Fig. 2. The wreck of the glider at the crash site.[source: SCAAI]

2. Injuries to persons

Injuries	Glider crew	Towing pilot	TOTAL
Fatal	2	0	2
Serious	0	0	0
Minor	0	0	0
None	0	1	1

3. Damage to aircraft

Due to the collision with the ground the glider was destroyed (Fig. 3, 4, 5).

The cockpit broke in the area of the front seat, was crushed and torn. There was a destruction of composite structures, including the nose, floor, sides, instrument panels, all control systems and canopy.

The wings were destroyed but did not separate from the fuselage, like the horizontal stabilizer. The fuselage broke in the rear part and in the area of its transition into the vertical stabilizer.



Fig. 3. Damage to the cockpit [source: SCAAI]



Fig. 4. Wreckage at the crash site – view from the right wing [source: SCAAI]



Fig. 5. Crushed and broken tail and torn right wing [source: SCAA]

4. Other damage

None.

5. Personnel information (crew data)

5.1. Glider Instructor (PIC)

Male, aged 58, holder of the:

- valid SPL license with instructor (FI) rating and „aerobatic” entry;
- medical certificate class 2 & LAPL with VML³ limitation;
- valid PPL(A) licence with SEP(L) and „night” entries;
- LKE/ULC examiner’ authorization in FE(S) and FIE(S)⁴ categories, expired in 2021.

The instructor had almost 30-year experience as a glider pilot. In 2003 he obtained the II class glider instructor qualification and, in 2007, the I class qualification. He regularly conducted glider trainings in a wide range: basic, license, perfecting and check flights as well as advanced aerobatics.

³ VML limitation – limitation requiring distant, intermediate and near vision correction.

⁴ FE(S) – concerns the duty of the flight examiner of check the students applying for SPL license, FIE(S) – concerns the check of the glider instructors.

He performed flights on 22 types of gliders, including 4 types dedicated to advanced aerobatics.

He flew advanced glider aerobatic since 2000, and since 2004 – unlimited.

For several years he took part in national and international aerobatic competitions as a pilot of MDM-1 "Fox", S1 "Swift" and SZD-59 "Acro" gliders. He trained and supervised trainings of many glider pilots, perfecting their qualifications and aspiring to obtain their aerobatic ratings.

In his personal logbook he noted 527 aerobatic flights.

Instructor's Total Time (TT) on gliders was approx. 1390 FH with 4295 take-offs, including:

- as PIC - 940 hrs.;
- as flight instructor - 450 hrs.

The list of the last 10 flying days prior to the occurrence is shown below.

Table 2. Last 10 flying days⁵

No.	Date (day - month)	Place (aerodrome)	Glider type	Flight character	Flight time (hrs.: min.)	Notes	
1	12 June	Turbia (EPST)	KR-03	INS	0:04	1 TO (take-off), winch	
			SZD-50-3		4:16	24 TO, winch	
2	02 July		SZD-9 bis	INS	1:05	9 TO, winch	
			SZD-50-3		0:28	4 TO, winch	
3	03 July		SZD-9 bis	INS	0:15	2 TO, winch	
			SZD-50-3		2:00	1 TO, winch	
4	06 August		Rudniki (EPRU)	Fox	INS ⁶	0:17	1 TO, towing plane
5	07 August			Fox	Solo flight	0:14	1 TO, towing plane
		SZD-50-3		INS	1:07	2 TO, towing plane	
6	03 September	SZD-9 bis		INS	0:13	1 TO, towing plane	
		SZD-50-3			1:38	6 TO, towing plane	
7	04 September	SZD-9 bis		INS	0:36	4 TO, winch	
		Fox			0:49	3 TO, towing plane	
8	08 October	Turbia (EPST)		SZD-50-3	INS	0:17	1 TO, towing plane
			SZD-32 Foka 5	INS	0:13	1 TO, towing plane	

⁵ Drawn up on the basis of the instructor's personal logbook.

⁶ The times and nature of flights on 6 and 7 August were reconstructed on the basis of the list of take-offs received from the regional aeroclub.

			SZD-50-3	INS	0:40	7 TO, towing plane
9	09 October		SZD-50-3	INS	0:35	6 TO, towing plane
			SZD-50-3		0:47	6 TO, towing plane
			KR-03		1:01	3 TO, towing plane
10	23 October 2022	Rudniki (EPRU)	Fox	INS	0:20	2 TO, towing plane. Second tow ended in accident

From May to October 2022, at the EPRU aerodrome, the instructor conducted 30 take-offs on the following types: MDM-1 "Fox", SZD-50-3 "Puchacz" and SZD-9 bis Bocian 1E, in TT of 9 hrs. 12 min.

5.2. Trainee

Male, aged 17, holder of the:

- valid SPL license with TMG⁷ entry;
- medical certificate class 2 & LAPL with no limitations;
- valid PPL(A) licence.

His TT on gliders was approx. 120 hrs.

Prior to the accident flight the trainee made 7 flights on MDM-1 "Fox" glider (including one solo flight on the accident day) in a TT of 1 hr. 57 min.

All those flights were a part of the training for the "aerobatics" rating and in accordance with the training program of local DTO⁸. The trainee was qualified for training by a decision of Head of Training (HT), which assigned him a responsible instructor.

The program of theoretical course was developed, implemented and confirmed in the Theoretical Training Chart by the assigned instructor on 6 Aug 2022.

A protocol of this course covered the following topics:

- human factor (1 hr.);
- technical subjects (1.5 hr.);
- limitations of the respective aircraft (1.5 hr.);
- aerobatic maneuvers and recovering (1.5 hr.);
- upset prevention and recovery (1 hr.).

⁷ TMG – touristic motogliders

⁸ DTO – Declared Training Organization

On the same day, i.e. 6 August 2022, the pilot was approved by the HT to flight training, what was confirmed by an entry in the Practical Training Chart.

Prior to the first aerobatic flight the trainee's TT on gliders was 107 hours.

The last entry in the Training Chart was made on 04 September 2022.

In the period from August to October 2022, as part of "aerobatics" training, the trainee made 19 take-offs on SZD-50-3 "Puchacz" and MDM-1 "Fox" types, in TT of 6 hrs. 14 min.

Due to the age of the trainee (underage), the consent to the training was given by a parent.

5.3. Towing pilot

Male, aged 45, holder of the:

- valid PPL(A) with SEP(L), glider towing and night flying entries;
- valid SPL license with instructor (FI) rating and an „aerobatics” entry;
- medical certificate class 2 & LAPL with VDL⁹ limitation.

The pilot declared his TT on aeroplanes as 123 hrs. and approx. 36 hrs. on WT-9 „Dynamic”.

He has had the rating for glider towing since September 2020 with some experience on 3 types of aircraft: MS893E Morane, Socata Rallye 235 and WT-9 „Dynamic”, on the latter several dozen towings¹⁰.

The list of towings in 2022 is presented below.

Table 6. Set of towings done by the towing pilot during last 10 flying days

No.	Date (d.m.y)	Aircraft type	No. of towings / Notes
1	19.07.2022	WT-9	1
2	24.07	WT-9	2
3	14.08	WT-9	2
4	21.08	Socata	12
5	25.08	Socata	4
6	27.08	WT-9	4
7	7.09	Socata	4
8	9.10	WT-9	3

⁹ VDL – limitation requiring correction for defective distant vision.

¹⁰ The exact value will be established.

9	14.10	Socata	3
10	23.10	WT-9	2
	23.10.2022	WT-9	Towing ended in the accident

6. Aircraft information

6.1 Glider

Design description

MDM-1 „Fox” (Fig. 6) is a two-seater glider, fully aerobatic mid-wing design with classic “cross-tail”. The structure is made of glass-fiber and carbon-fiber composites.

The glider was certified in aerobatic category as per JAR-22 regulations, then transferred to EASA system under the Type Certificate no. EASA.A.039¹¹. The Type Certificate Holder is Zakłady Lotnicze Margański & Mysłowski Sp. z o.o.

The Type-Certificate Data Sheet (TCDS) records two deviations from the regulations that the glider did not comply with:

1. Stall speed with two-person crew exceeded 80 kph (requirement of JAR 22.49) and;
2. Airbrakes operating force on the handle in cockpit exceeded 20 daN (requirement of JAR 22.143).

Maximum Take Off Mass (MTOM) is 530 kg and the empty weight around 350 kg.



Fig. 6. MDM-1 „Fox” in flight [source: JetPhotos.net]

¹¹ In 2005, on the basis of the recognition of the national (Polish) certificate number BG-197, EASA issued a European (EASA type) certificate, previously in accordance with JAR-22.

The glider is of a compact shape, zero degrees wing dihedral, low aspect ratio and a high wing loading.

In flight it is characterized by high maneuverability and with two pilots on board the range of g-loads is +7/-5.

Basic data:

- type (class) of the aircraft – aerobatic glider (Fig. 7);
- design – full composite mid-wing;
- designation – advanced aerobatic training, competition;
- number of seats – 1+1;
- registration marks – SP-3828;
- model – MDM-1 „Fox”;
- year of manufacture – 2012;
- serial no. – 243;
- owner – Aeroclub of Poland;
- user – Aeroklub Częstochowski.

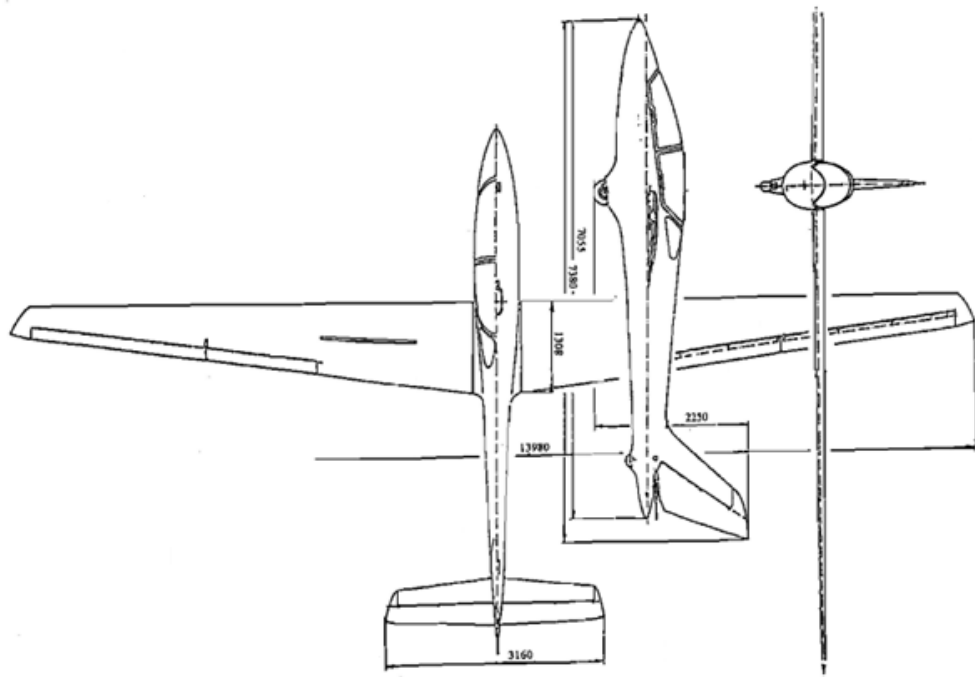


Fig. 7. MDM-1 „Fox”, 3D view [source: Flight Manual]

Certificate of Registration (CofR) – valid on the day of occurrence:

- no. in registry – 3828 (registry of civil aircraft of Poland);
- date of entry – 08 February 2022.

Certificate of Airworthiness (CofA) – valid on the day of occurrence:

- date of issue – 23 June 2012;

- limitations – entry in certificate „for training purpose”.

Airworthiness Review Certificate (ARC)¹² – valid on the day of occurrence:

- date of issue – 19 April 2022;
- date of expiration – 18 April 2023.

Confirmation of release to service (CRS)¹³ – 50 FH check:

- date of issue – 9 September 2022.

Radio Certificate:

- date of issue – 08 July 2019;
- date of expiration – 08 July 2029.

Certificate of insurance (CofI) – valid on the day of occurrence.

Life cycle data¹⁴

TTSN (Total Time Since New)	809 hrs. 31 min.
No. of take-offs	3025
Time since the last maintenance	34 hrs. 32 min.
No. of take-offs since last maintenance	116
Date of last maintenance (50 FH)	09.09.2022 r.
– done at TTSN / no. of take-offs	774 hrs. 59 min. / 2909;
– effected by Part CAO.	

Maintenance

The maintenance was carried out by approved Part CAO.

It was established that:

- scheduled maintenance was carried out on-time;
- the applicable airworthiness directives and service bulletins were implemented;
- the equipment in the instrument panels complied with the requirements of the TCDS and the Flight Manual;
- life-limited parts were properly maintained and/or replaced in accordance with their service life and requirements;
- replacement of seat belts (on both seats) took place in June 2022 with a new service life of 15 years (until 2037);
- the overhaul of the towline release hook was carried out in May 2019. On the day of the accident 970 cycles were left.

¹² Issued by Part-CAO.

¹³ Issued by Part-CAO. The CRS from the last maintenance included stabilization of the glider as well.

¹⁴ Based on the maintenance status provided by Part-CAO.

6.2 Towing plane

Design description

WT-9 "Dynamic" (Fig. 8) is a two-seat, single-engine tourist aircraft, low-wing design, approved for operation in VMC (according to VFR regulations). It was built using carbon composites. It is produced in Slovakia as an ultralight (like SP-SHEL) and in LSA (Light Sport Aircraft) versions. The retractable landing gear is optional and was used on the SP-SHEL aircraft.

WT-9 is recognized as stable in flight with no tendency to stall or spin. SP-SHEL is equipped with a BRP Rotax 912 ULS engine 100 HP (using unleaded gasoline) with a built-in composite, three-blade, variable-pitch Woodcomp SR-2000/DN propeller.

The aircraft received type certificate No. 61179 issued by the German Aviation Authorities (LBA) in accordance with the German certification and airworthiness regulations for ultralights, and type certificate No. V-80/2004 issued by the aviation authorities of Slovakia.



Fig. 8. Towing plane WT-9 „Dynamic”, SP-SHEL [source: SCAAI]

In Poland, the aircraft type was approved¹⁵ based on Aerospool (manufacturer) documentation and released for operation in the "ultralight" category, in accordance with the Regulation of the Minister of Infrastructure of 25 April 2005 on the exclusion of the application of certain provisions of the Aviation Law to certain types of aircraft (...), Annex 5 (Journal of Laws No. 107, item 904).

In 2021, on request of the owner, the SP-SHEL was reclassified to the category of K4 "flying devices", subcategory UL-A and received the Polish CAA (ULC) certificate of evidence (no. 0654).

¹⁵ Based on the record in the Flight Manual of WT-9 „Dynamic” aircraft.

According to the related Flight Manual the maximum take-off weight is 472,5¹⁶ kg and the empty weight is 323,2 kg¹⁷.

A TOST type tow release and a USH-52 S Softpack parachute rescue system were mounted on the aircraft.

The airworthiness of SP-SHEL was confirmed by an entry in the aircraft logbook (in “Permit to fly” chapter) with an expiration date of 23 May 2023. The entry was made by a maintenance organization.

According to the documentation presented by the owner, after receiving the permit to flight, the following scheduled maintenance works were carried out on the aircraft:

- on 23 May 2022 – „aircraft maintenance 100 FH/annual” – done after TTSN 1296:55 FH¹⁸ and;
- on 18 July 2022 – „engine, propeller check 100 FH/annual” – done after TTSN 1345:30 FH.

The Radio Certificate for ICA-210E and the GTX-327 Garmin transponder were valid. Both devices were installed in the aircraft instrument panel.

The Radio Certificate was accompanied by another ULC document allowing the derogation from 8.33 kHz channel spacing - valid until the date of expiry of the Radio Certificate.

7. Meteorological information

15 min. before the occurrence, at 12:00 hrs., a METAR was issued for Katowice-Pyrzowice airport (EPKT), located 47 km away, with the following content:

METAR EPKT 231000Z 20011KT 9999 BKN006 12/10 Q1020=

- date: 23.10.2022;
- time: 10:00 UTC;
- wind direction: 200°;
- wind speed: 11 kt;
- visibility: over 10 km;
- clouds 5÷7/8 at 600 ft AGL;
- ambient temperature: 12°C;
- dew point: 10°C;
- QNH 1020 hPa.

¹⁶ As per the Flight Manual, with the USH-52 S "Softpack" rescue system built-in, the maximum take-off weight of the aircraft is 472.5 kg.

¹⁷ Empty weight as per weighing protocol for SP-SHEL, dated 15.10.2014.

¹⁸ As per the aircraft logbook maintenance entries.

At the time of the occurrence on EPRU aerodrome the sun was shining: CAVOK¹⁹ with high, a few cirrus clouds. A moderate wind was blowing from the SW directions.

The weather is illustrated by a photo taken at the aerodrome in the afternoon (Fig. 9).



Fig. 9. The weather around EPRU on the day of occurrence [source: Dziennik Zachodni, webpage]

8. Aids to navigation

Not applicable.

9. Communications

Both the glider and its towing plane were equipped with radios operating on the frequency of 122.8 MHz.

The towing pilot declared that just before the accident flight, he made a radio check.

The ground station received the messages of the towing pilot directed to the crew of the glider.

During the flight on tow and after releasing, the glider crew did not transmit any messages.

10. Aerodrome information

EPRU aerodrome – Częstochowa Rudniki (Fig. 10), general information:

- a) ARP – WGS-84 coordinates: 50°53'05"N; 019°12'11"E;
- b) Permitted air traffic: VFR;
- c) Operator: Aero Partner Sp. z o.o.;
- d) Working hours: Monday-Friday, 07.00÷15.00 or to be established with operator;
- e) Air traffic services (ATS): – none, contact Rudniki Radio 122,800 MHz;
- f) Rescue and firefighting service: none.

¹⁹ CAVOK - a weather status when visibility is at least 10 km, there are no clouds below 5000 feet, e.g. CB (Cumulonimbus) or TCU (towering cumulus), no precipitation, thunderstorms etc.

Meteorological information provided by Central Bureau of Meteorological Forecasts in Krakow.

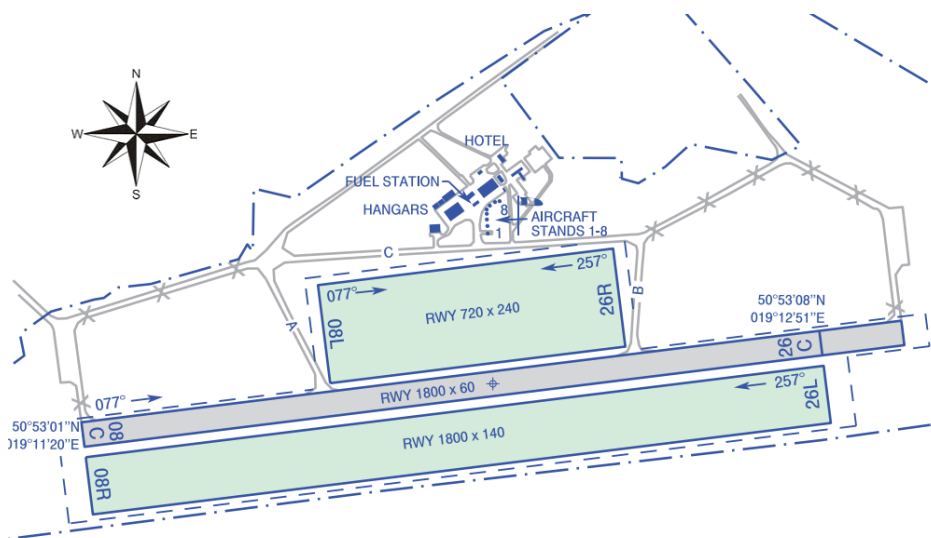


Fig. 10. EPRU aerodrome – runway positioning [source: AIP Poland]

11. Flight recorders

MDM-1 Fox, SP-3828

The glider was not equipped with flight recorders since none of them was required under applicable law.

AM-10 g-meter (Fig. 11) with an indication range of +10g/-5g was installed in the nose cockpit. This instrument is a part of the minimum equipment of the glider as required by the TCDS EASA. A.039 and the Flight Manual. During the collision the g-meter detached from the instrument panel.

The instrument pointers are designed to stop at the maximum values of g-load obtained in flight: positive and negative. The pointer stopped at +9g. This is an unreliable value because the g-load when colliding with the ground was several times greater and could not be recorded by the instrument.

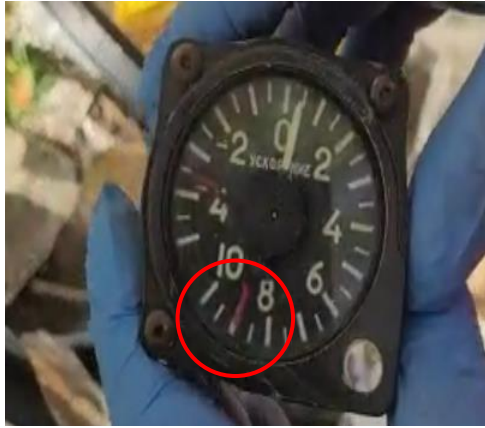


Fig. 11. G-meter found in the wreck – frame from the video recording made at the crash site [source: SCAAI]

WT-9 „Dynamic”, SP-SHEL towing plane

The plane was not equipped with flight recorders since none of them was required under applicable law.

The aircraft was equipped with GPS Garmin 296 and the FlyDat device to monitor the Rotax engine parameters (Fig. 12).

During the accident flight GPS did not contain a memory card and the FlyDat recording has not been retrieved yet.



Fig. 12. Towing plane instrument panel: (a) GPS Garmin 296, (b) FlyDat to monitor Rotax engine [source: SCAAI]

12. Wreckage and impact information

The glider collided with the ground along almost vertical track with a right-wing slip. This was evidenced by a witness statement and the lack of traces of the glider's movement on the ground. The energy of the collision was absorbed by the pilots' cabin and the right wing as evidenced by the destruction.

13. Medical and pathological information

The pilots were killed on the spot due to acceleration acting on their bodies. Both pilots sustained external and internal injuries.

14. Fire

Did not occur.

15. SCAAI activities done

1. The following documents were secured: accident site documentation, the glider and towing plane records, records of the pilots involved in the accident, organization records (take-off lists, on-board technical log of the glider, Operation Manual, others), recording from the aerodrome CCTV;
2. The statements of witnesses were collected and analyzed;
3. The glider wreckage and the towing aircraft were secured for further investigation;
4. Fuel samples from the tanks of the towing aircraft were secured for testing;
5. A detailed inspection of the towing plane powerplant was carried out, including a borescope examination of the engine cylinders. Some of the components were disassembled for their further examination.

In addition, the following findings were established:

SP-3828 Glider

Due to the destruction of the glider, including the rupture of the control systems, it was not possible to confirm the kinematic continuity of the drives.

The trajectory from take-off to the release of the glider was determined based on recordings of the aerodrome CCTV cameras, the statements of the towing pilot and witnesses as well as on the basis of the practices of towing the MDM-1 "Fox" by the WT-9 "Dynamic".

SP-SHEL Towing aircraft

The WT-9 "Dynamic", SP-SHEL, performed an emergency landing with the engine running and then taxied to a hangar about 700 meters away.

It was determined that:

- the hour-meter recorded the TTSN of 5584 mth;

- the entries in the logbook did not include the take-offs made on the day of the occurrence and earlier;
- the aircraft was insured against third party liability and Aero Casco. The policy covered, among other things, glider towing operations and contained family names of the pilots authorized to tow. The name of the pilot involved in the accident was on the list;
- the maximum take-off mass of the aircraft was not exceeded;
- preliminary examination of the engine showed a lack of compression in cylinder no. 1 and the presence of a significant amount of carbon deposits on both spark plugs of that cylinder (Fig. 13);
- the electrodes of spark plugs removed from the cylinders no. 2, 3 and 4 were clean, all in light gray colour.

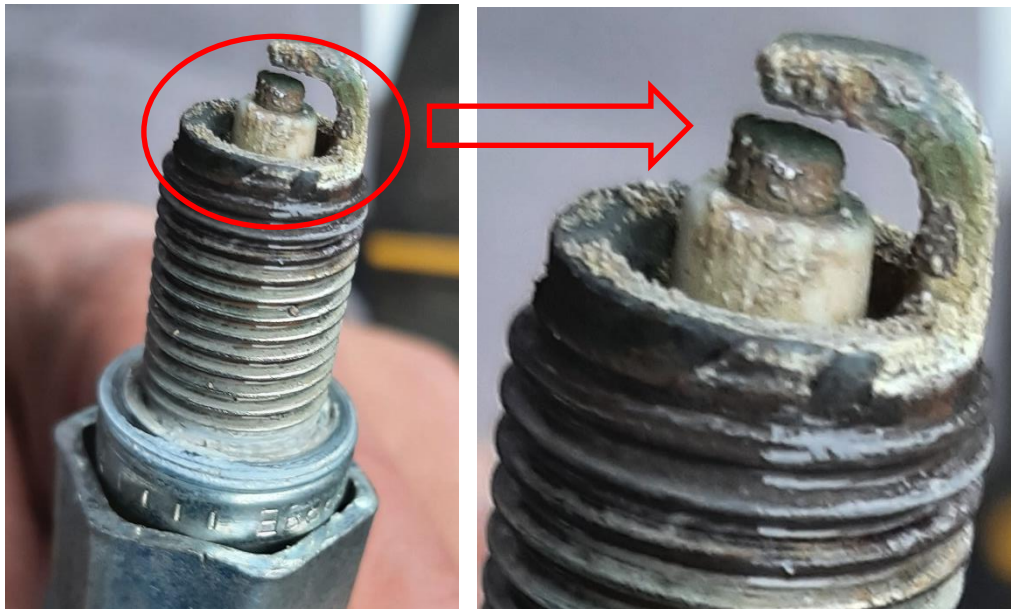


Fig. 13. Spark plug and its contamination on the electrodes after removal from the head of cylinder no. 1 [source: SCAA]

Moreover:

- borescope inspection of each cylinder revealed significant amount of carbon deposit in each cylinder. Cylinder head no. 1 was removed from the engine to check the combustion chamber and the piston;
- the condition of the piston crown (left) and valves (right) is illustrated in Fig. 14.

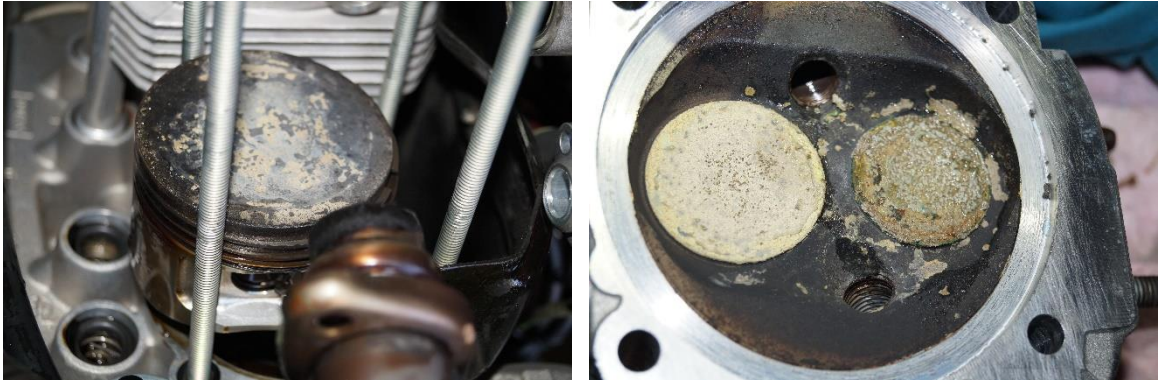


Fig. 14. The piston and the valves of the cylinder no. 1 [source: SCAAI]

- the condition of the cylinder no.1 interior was inspected with a borescope (Fig. 15);



Fig. 15. Internal corrosion of the cylinder no. 1. Pictures were taken with the borescope camera [source: SCAAI]

- the fuel samples, taken twice from drainage, were clean, clear and without water inclusions;
- the fuel filter on the engine was filled with fuel (Fig. 16);
- samples of fuel from the aircraft tanks were taken for further examination.



Fig. 16. The outer fuel filter on the engine [source: SCAAI]

16. SCAAI planned actions

- 1) An attempt to read out and analyze the recording from the FlyDat.
- 2) Analysis (possibly) of fuel samples taken from aircraft tanks.
- 3) Analysis of the towing plane airworthiness, assessment of the condition of the aircraft engine.
- 4) Any further actions of the SCAAI regarding the towing plane will depend on the results of the actions referred to items 1÷3.
- 5) Analysis of the take-off of the towing plane and the glider.
- 6) Analysis of the course of the occurrence since glider release.
- 7) Analysis of survival aspects.
- 8) Preparation of the draft Final Report.
- 9) Consultation of the draft Final Report.
- 10) Publication of the Final Report.

END

*Signature on original
Investigator-in-charge*