



# **Havarikommissionen**

Accident Investigation Board Denmark

## **Bulletin 2020-260**



**Accident to OY-RUX (PZL-Bielsko SZD-59 ACRO) at Vesthimmerland (EKVH) on 9-7-2020.**

**ISSUED JUNE 2021**

# INTRODUCTION

This bulletin reflects the opinion of the Danish Accident Investigation Board regarding the circumstances of the occurrence and its causes and consequences.

In accordance with the provisions of EU Regulation 996/2010, the Danish Air Navigation Act and pursuant to Annex 13 of the International Civil Aviation Convention, the safety investigation is of an exclusively technical and operational nature, and its objective is not the assignment of blame or liability.

The safety investigation was carried out without having necessarily used legal evidence procedures and with no other basic aim than preventing future accidents and serious incidents.

Consequently, any use of this bulletin for purposes other than preventing future accidents and serious incidents may lead to erroneous or misleading interpretations.

A reprint with source reference may be published without specific permission.

# CONTENTS

<b>GENERAL .....</b>	<b>4</b>
<b>SYNOPSIS .....</b>	<b>5</b>
<b>FACTUAL INFORMATION .....</b>	<b>6</b>
History of flight.....	6
Injuries to persons .....	7
Damage to aircraft .....	7
Other damage .....	8
Personal information .....	8
License and medical certificate.....	8
Flying experience.....	8
Aircraft information .....	8
General information.....	8
Mass and balance .....	9
Retraction and extension of the landing wheel: .....	9
Batteries .....	10
Meteorological information.....	11
Low Level Forecast (Extract) .....	11
Terminal Aerodrome Forecast (TAF).....	11
Aviation Routine Weather Report (METAR).....	11
Aftercast valid for EKVH at 13:18 .....	11
Communication .....	12
Aerodrome information.....	12
General information .....	12
Technical investigation.....	12
Additional information .....	14
<b>ANALYSIS.....</b>	<b>15</b>
General .....	15
<b>CONCLUSIONS.....</b>	<b>16</b>
<b>APPENDIX 1 .....</b>	<b>17</b>

**GENERAL**

State file number:	2020-260
UTC date:	9-7-2020
UTC time:	13:18
Occurrence class:	Accident
Location:	Vesthimmerland (EKVH)
Injury level:	None
Aircraft registration:	OY-RUX
Aircraft call sign:	4W (in use for competition flying)
Aircraft make/model:	PZL-Bielsko SZD-59 ACRO
Current flight rules:	Visual Flight Rules (VFR)
Operation type:	Private
Flight phase:	Landing
Aircraft category:	Glider
Last departure point:	Vesthimmerland (EKVH)
Planned destination:	Vesthimmerland (EKVH)
Aircraft damage:	Substantial

**SYNOPSIS****Notification**

All time references in this bulletin are Coordinated Universal Time (UTC).

The Aviation Unit of the Danish Accident Investigation Board (AIB) was notified of the accident by the Danish Gliding Federation (DSvU) on the 9-7-2020 at 13:48 hours (hrs).

On the 10-7-2020 at 12:59 hrs, the AIB notified the Polish State Commission on Aircraft Accident Investigation (SCAAI), the European Aviation Safety Agency (EASA), the Directorate General for Mobility and Transport (DG Move) and Danish Transport, Construction and Housing Authority (DTCHA).

The SCAAI accredited a non-travelling representative to the AIB safety investigation.

**Summary**

A technical malfunction of the landing wheel retraction and extension system forced the pilot to make a wheel-up landing leading to the accident.

The accident occurred during day light and under Visual Meteorological Conditions (VMC).

## FACTUAL INFORMATION

### History of flight

At 09:43 hrs, the pilot made a winch launch from Vesthimmerland (EKVH) runway 29 grass. If thermal activity allowed, the pilot intended to do a cross country soaring flight.

To the pilot, the winch launch was normal. However, the pilot experienced that it was harder than normal to retract the landing wheel.

The thermal activity was good, and the pilot gained sufficient altitude before leaving the EKVH area.

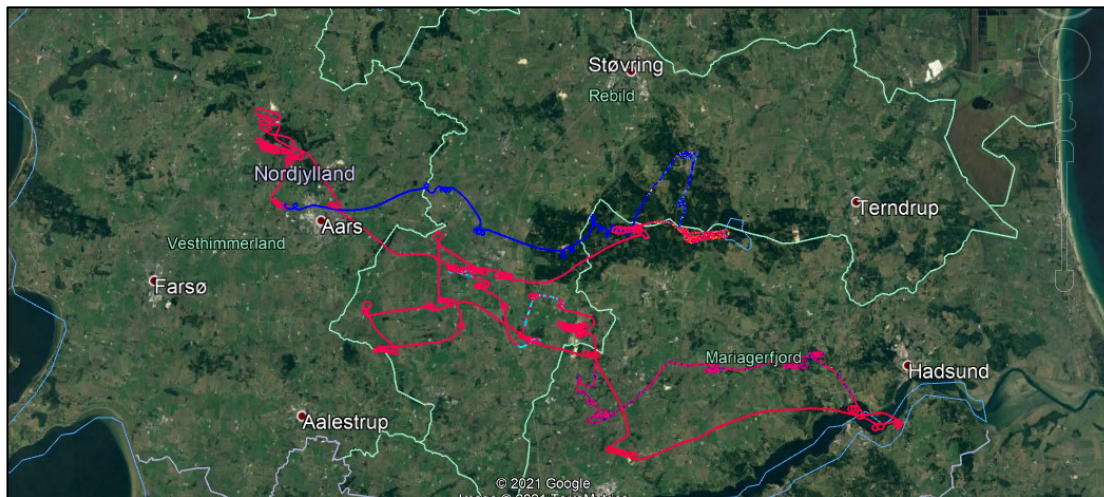


Photo no.1: Flown cross-country track in red.

After approximately 3 hours and 20 minutes of flying, the glider at 3000 feet (ft) returned to the area close to EKVH and started descending.

During the last part of the flight, the pilot realized that the battery was flat.

Approaching the traffic circuit for landing on runway 29 grass (south of the asphalted runway), the pilot started extending the landing wheel. It was only possible to move the landing wheel handle approximately 25% of full movement, before it was stuck.

The pilot turned the glider 180° and transmitted: *4W can't take the wheel out – Can't take the wheel out landing on runway 29 grass - Can't take the wheel out – Can't take the wheel out.* The pilot unsuccessfully tried to use both hands to move the landing wheel handle forward.

During this period, two gliders had landed on runway 29 grass and now occupied the grass runway south of the asphalted runway. In the far end of runway 29 grass, a tractor cut the grass. North of the asphalted runway two other gliders occupied runway 29 grass. It was the perception of the pilot, that these two gliders were ready for winch launches.

As the altitude got critical low, the pilot decided to land on runway 29 asphalt and transmitted : *4W landing on runway 29 asphalt can't get the wheel out – can't take the wheel out.*

The glider made a wheel-up landing on runway 29 asphalt.



Injuries to persons

Injuries	Crew	Passengers	Others
Fatal			
Serious			
None	1		

Damage to aircraft

The wheel-up landing resulted in severe abrasive damage to the skin and frames of the lower part of the fuselage just forward of the wheel doors. Further abrasive damage was found on both landing wheel doors. There were no damages to the wings or the tail.



Photo no. 2: Abrasion damage to the lower part of the fuselage skin, frames and wheel doors.

**Other damage**

Photo no. 3: Scrape marks on the asphalt surface of runway 29.

There were no damages to the asphalt surface of runway 29. Paint and fibreglass from the glider caused white scrape marks on the asphalt.

**Personal information**License and medical certificate

The pilot – male 23 years old – was the holder of a valid Sailplane Pilot Licence (SPL/S) issued by the Romanian CAA (Civil Aeronautical Authority) on the 24-4-2019.

The medical certificate (class 2) was valid until 24-4-2024. The medical certificate held the limitation *correction for defective distant vision (VDL)*.

Flying experience

	Last 24 hours	Last 90 days	Total
All types	4:10	7:25	57:40
This class/type	4:10	4:40	4:40
Landings class/type	2	20	310

**Aircraft information**General information

Manufacturer:	PZL- Bielsko
Type:	SZD-59 ACRO
Serial number:	590.A.06.007
Airworthiness Review Certificate:	Valid until 16-7-2021
Empty weight:	271 kilograms (kg)



Maximum take-off mass (MTOM):	390 kg
Center of gravity (CG) range	145 to 275 mm
Aircraft total flight hours:	586:20
Latest maintenance:	7-5-2020

#### Mass and balance

The pilot stated that the actual take-off mass was 350 kg.

The pilot stated that based on the latest weighing report and the mass of the pilot (including a parachute), the actual Center of Gravity (CG) was calculated to be 239, 9 mm.

#### Retraction and extension of the landing wheel:

In the cockpit on the right hand side there was a landing wheel handle, which by the pilot, after release of a tap, could be moved rearwards (landing wheel retraction) and forwards (landing wheel extension).

The landing wheel handle was welded to a tube, named landing wheel handle tube, which at the forward position ran in and was supported by another tube. At the aft position, the landing wheel handle tube was connected, by a rod end, to a lever arm, which was connected directly to the landing wheel. The landing wheel handle tube was connected to the rod end by a nut and tap washer, which should secure the rod end to the landing wheel handle tube.

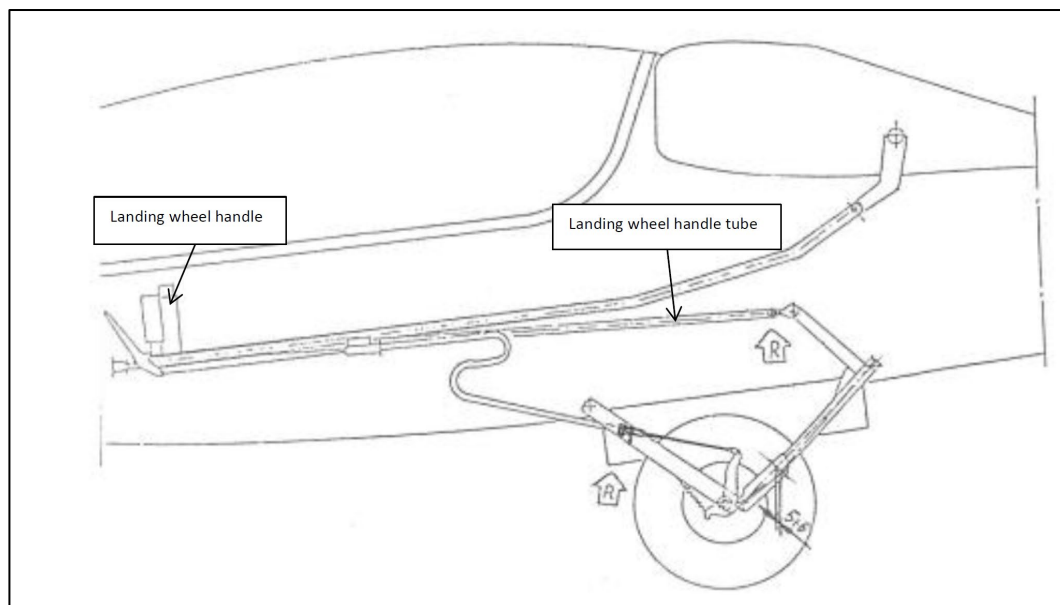


Photo no. 4: Landing wheel retraction and extension system.

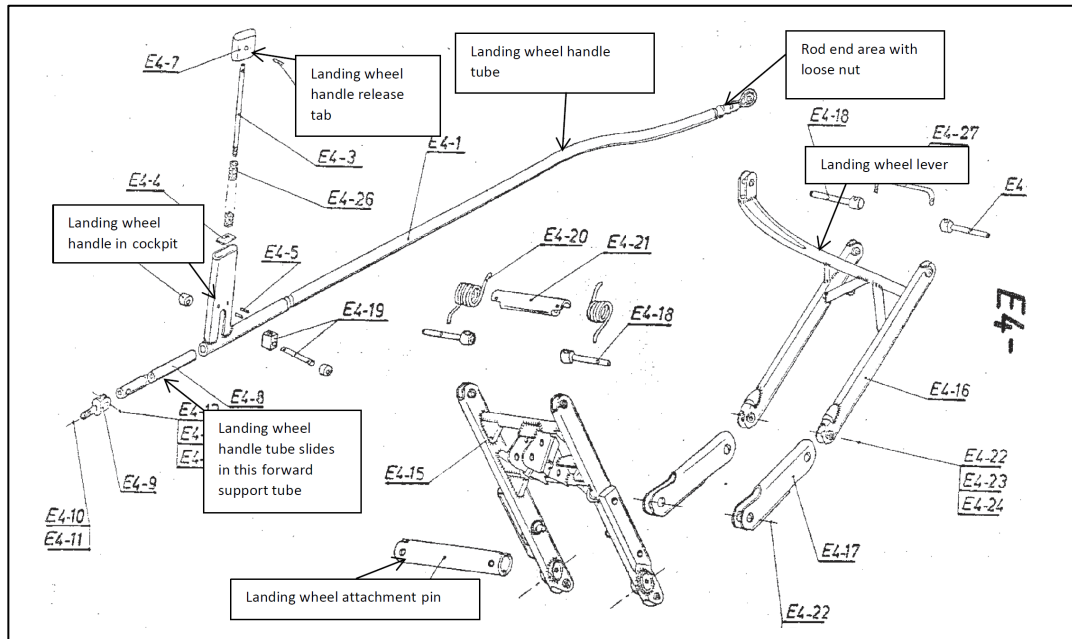


Photo no. 5: Landing wheel retraction and extension system.

### Batteries

The glider was equipped with two batteries. By using a switch in the cockpit, it was possible to switch battery source between the two batteries. The label identifying the switch was missing.



Photo no. 6: Battery switch.

## Meteorological information

### Low Level Forecast (Extract)

The location of EKVH was in area 52d.

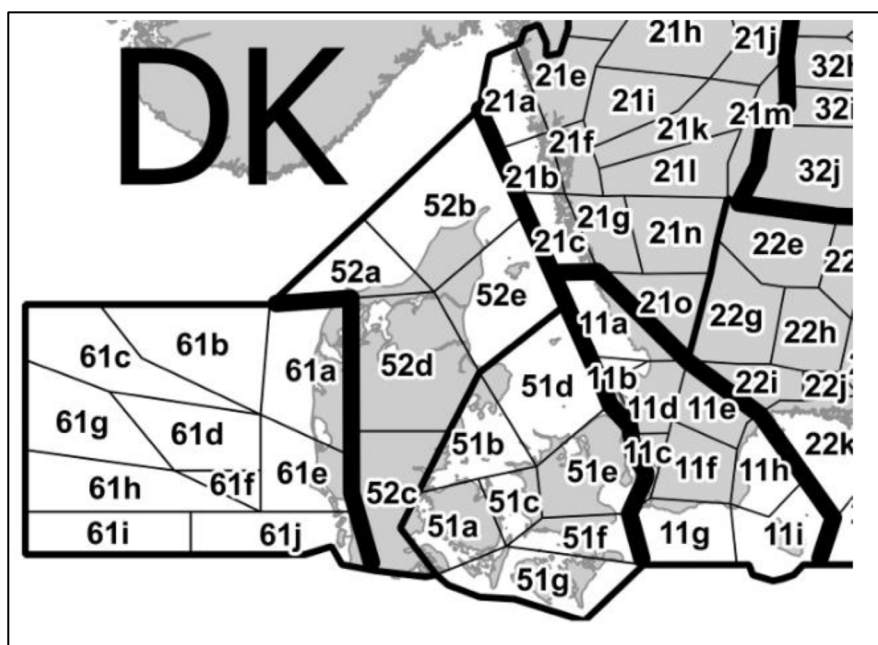


Photo no. 7: Meteorological regions.

FBDN 22 EKCH 091100 forecast for area dk 52d Jutland issued 09:11:49 valid on 9-7-2020 between 12:00 and 20:00.

General: West/north-westerly flow of cold and somewhat unstable air. Frontal zone just south of area is moving east, later northeast.

Visibility: More than 8 kilometres (km) cloudbase >4000 ft, locally 2000 ft-4000 ft.

Icing: Not expected.

Surface: West/north-westerly/4-14 knots (kt), gusts up to 22 kt.

### Terminal Aerodrome Forecast (TAF)

No TAF was issued for EKVH.

Aalborg Airport (EKYT) was located approximately 35 km northeast of EKVH.

TAF EKYT 091111Z 0912/1012 27008KT 9999 FEW040=

### Aviation Routine Weather Report (METAR)

No METAR was issued for EKVH.

METAR EKYT 091320Z AUTO 27009KT 240V310 9999 FEW180/// 17/09 Q1011=

METAR EKYT 091350Z AUTO 27009KT 240V320 9999 FEW034/// 16/08 Q1011=

### Aftercast valid for EKVH at 13:18

General: West/northwesterly flow of cold and somewhat unstable air over northern Jutland.

Visibility: Visibility more than 10 km, presumably 30-60 km. No weather phenomena.

Clouds and Few/Scattered cumulus base approximately 3500 ft, top up to 5000-6000 ft.

icing:

Surface wind: 290°/09 kt with gusts up to 16 kt.

### Communication

The pilot was in radio contact with Vesthimmerland radio on 122.225 MegaHertz (MHz).

During the last part of the flight, the pilot noticed that the battery was flat.

Due to the emergency, the pilot forgot that radio transmissions were not possible and transmitted blind.

Nobody on the ground or in the air noticed any distress transmissions by the pilot.

### Aerodrome information

#### General information

Aerodrome Reference Point: 56 50 49.28N 09 27 30.74E

Elevation: 119 feet

Runway directions: 11/29

Runway dimensions: 1212 x 23 meter (m)

Runway surface: Asphalt

Additional information: Gliders took off from the grass area, north and parallel to the asphalt runway and landed on the grass area, south and parallel to the asphalt runway. Alternatively, the asphalt runway could be used.

Runways 17/35 were not used.

[See appendix 1.](#)

### Technical safety investigation

Shortly after the accident, the AIB several times, with the glider placed in a jig at EKVH, tested the retraction and extension of the landing wheel.

When the landing wheel handle was approximately 90 degrees to the horizontal plane, the landing wheel handle could be moved forward and aft without any jamming or binding.

The landing wheel handle could be turned some degrees to the left and right, and if so the landing wheel handle could only be moved approximately 25-30% of the complete forward travelling length, before the landing wheel handle jammed and was stuck.

During the emergency, the pilot used both hands to move forward the landing wheel handle. However, by this pilot action, the landing wheel handle was turned even more, which made the jamming worse.

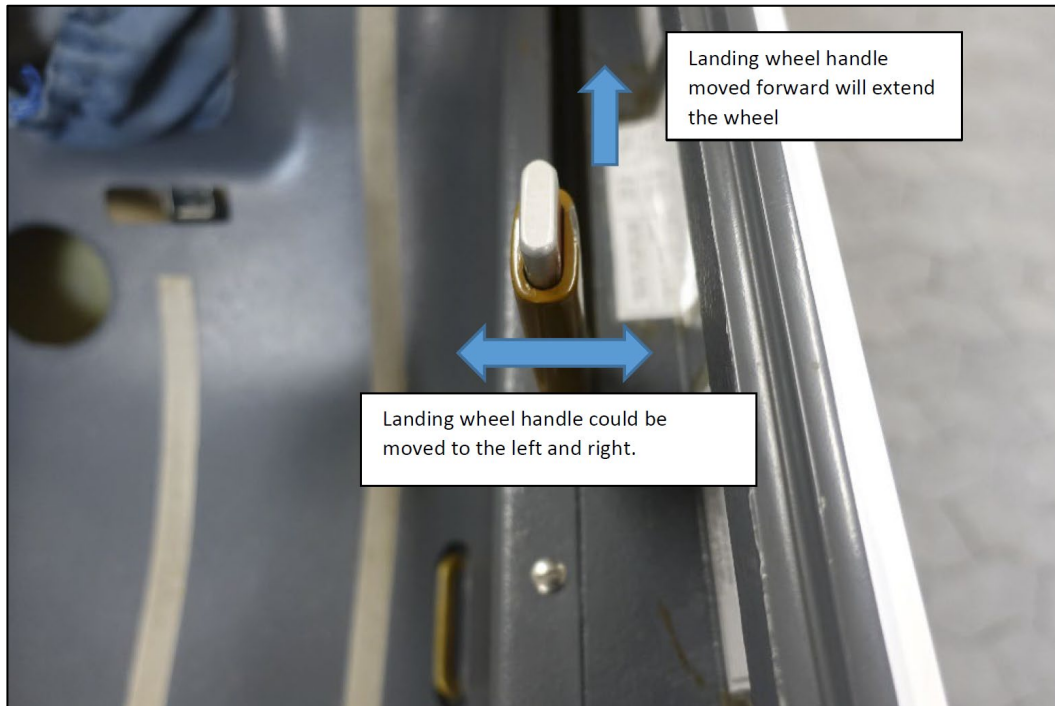


Photo no. 8: Movement of the landing wheel handle in the cockpit.

A detailed inspection of the landing wheel handle tube aft area, where the rod end was screwed into the landing wheel handle tube, revealed that the nut, securing the rod end to the landing wheel handle tube, was loose and there was a small gap between the nut/tab washer and aft face of the landing wheel handle tube. Further, the bend of the tab washer was not securing/locking the nut.

For that reason, the landing wheel handle/landing wheel handle tube could be turned to the left and right and thus restricted forward movement of the landing wheel handle.

When the nut was tightened to the landing wheel handle tube and the nut secured, the landing wheel handle tube and landing wheel handle could no more be rotated to the left and the right allowing the landing wheel to be retracted and extended without any problems.



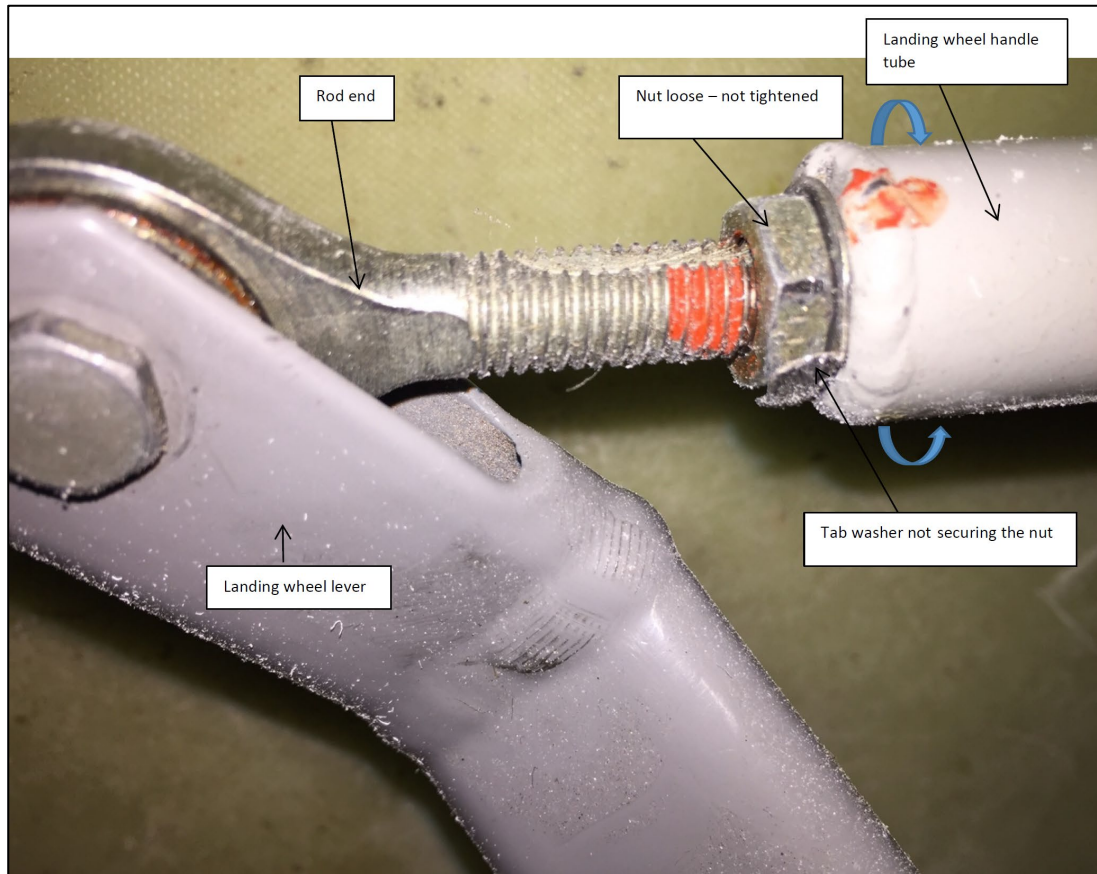


Photo no. 9: Landing wheel handle tube rod end connection to landing wheel lever with the loose nut.

### Additional information

In the morning, when arriving at the glider, the pilot noticed that the battery had not been removed from the glider for charging the day before. After the last flight of the day, the battery was normally removed from the glider and charged overnight.

The pilot removed the battery for charging. Another pilot told him that a 2 to 3-hour battery charging should be sufficient.

The battery charger only presented either a green or a red light and not specific charging values.

After the 2 hours of charging, the green light was on. The pilot then assumed that the battery had been charged enough and reinstalled the battery in the glider.



## ANALYSIS

### General

The pilot was properly licenced.

The Airworthiness Review Certificate was valid.

The take-off mass and CG were within the allowable limits.

The landing wheel could not be extended, because the landing wheel handle tube could rotate around its longitudinal axis causing the landing wheel handle tube to jam/get stuck during the forward movement, if the landing wheel handle was slightly turned.

The ability of the landing wheel handle tube to rotate was caused by a loose and not secured nut used to attach the rod end to the aft end of the landing wheel handle tube.

A discharged battery in combination with probably insufficient pilot knowledge of switching battery source limited the pilot decision making process on available landing runways.

## CONCLUSIONS

A technical malfunction of the landing wheel retraction and extension system forced the pilot to make a wheel-up landing leading to the accident.

## APPENDIX 1

[Return to aerodrome information.](#)

