

*The original of the Final Report was issued in the Slovak language.
In case of inconsistency original version in Slovak language is applicable.*



AVIATION AND MARITIME INVESTIGATION AUTHORITY
Námestie slobody 6, P.O.BOX 100
810 05 Bratislava 15

FINAL REPORT

on Investigation of a Serious Incident
of aircraft type **PS-28 Cruiser**
registration number **OM-STR**

Ref. No.: SKS2016002

The investigation of occurrence has been conducted pursuant to Art. 18 of the Act No. 143/1998 on Civil Aviation (Civil Aviation Act) and on Amendment of Certain Acts and in accordance with the Regulation (EU) No. 996/2010 of the European Parliament and of the Council on investigation and prevention of civil aviation accidents and incidents, governing the investigation of civil aviation accidents and incidents.

The final report is issued in accordance with the Regulation L 13 that is the application of the provisions of ANNEX 13 Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation.

The exclusive aim of investigation is to establish causes of accident, incident and to prevent their occurrence, but not to refer to any fault or liability of persons.

This final report, its individual parts or other documents related to the investigation of occurrence in question have an informative character and can only be used as recommendation for the implementation of measures to prevent occurrence of other accidents and incidents with similar causes.

A. INTRODUCTION

Operator / Owner:	Aviation Trading s.r.o. / VÚB Leasing, a.s.
Type of operation:	Sport and recreational flying
Aircraft type:	PS-28 Cruiser
Registration number:	OM-STR
Take-off:	Sládkovičovo/ LZSLAD, ultra light aircraft runway, non-public
Flight phase:	Landing
Location of incident:	LZSLAD
Date and time of incident:	14/08/2016, 17:55

Note: All times in this report are in UTC time.

B. INFORMATIVE SUMMARY

On 14/08/2016 at about 17:55, during landing and after a three-point touchdown, the aircraft bounced several times successively, which resulted in the breaking of the front landing gear and propeller.

The following person was nominated to investigate the cause of the serious incident:

Ing. Zdeno BIELIK	- Chairman of the Investigation Committee
Ing. Juraj GYENES	- Member of the Investigation Committee

The report was issued by:

The Aviation and Maritime Investigation Authority
The Ministry of Transport, Construction and Regional Development
of the Slovak Republic

C. MAIN PART OF THE REPORT

1. FACTUAL INFORMATION
2. ANALYSIS
3. CONCLUSIONS
4. SAFETY RECOMMENDATIONS

1. FACTUAL INFORMATION

1.1 History of the flight

The pilot started the flight at 17:20 from LZSLAD Airport. The flight proceeded without problems until the approach phase when, after approaching at high speed, the pilot touched down on three points and after the front landing gear touched down, the aircraft bounced several times, while the front landing gear leg broke off and the propeller was subsequently damaged. No one was injured during the incident.

Daytime: day
Flight rules: VFR

1.2 Injuries to persons

Injury	Crew	Passengers	Other persons
Fatal	-	-	-
Serious	-	-	-
Minor	-	-	-
None	1	1	-

1.3 Damage to aircraft

The front landing gear and propeller were damaged in the incident, the exhaust and the heating pipes were deformed, the engine mount was cracked, the cabin floor and the coating in the bottom of the fuselage were deformed.





1.4 Other damage

The Aviation and Maritime Investigation Authority has not been notified of any circumstances with potential claims for other compensation to third parties.

1.5 Personnel information

Pilot:

Slovak citizen, 18 years of age,

Holder of a private pilot license (aeroplane) PPL(A) issued by the Civil Aviation Authority of the Slovak Republic, with marked validity until 30/06/2017.

Medical certificate class 1 with marked validity until 03/05/2017.

Medical certificate class 2 with marked validity until 03/05/2021.

Qualification: SEP(L)

Flight experience:

Total flight hours: 57 h 48 min

1.6 Aircraft information

Type: PS-28Cruiser

Registration number: OM-STR

Serial number: C0517

Manufacturer: Czech Sport Aircraft a.s. Kunovice, Czech Republic

Certificate of airworthiness No. 1227/02, issued by the authorised organization HERBST AERO, a.s. Karkulínova 27, Brno.

Certificate of registration in the Aircraft Register No. 1227/01 issued by the Transport Authority of the Slovak Republic on 10/07/2015.

Mandatory insurance: ALLIANZ Slovenská poisťovňa, a.s. No.411022165, valid until 01/04/2017.

1.7 Meteorological information

Clear, clouds 3-4 / 8, visibility over 10 km.

1.8 Aids to navigation

Not applicable.

1.9 Communications

Not applicable.

1.10 Aerodrome information

LZSLAD Airport - UL area, non-public.

Runway / VPD 14/32.

Dimensions 800 x 80 m grass.

ELEV 120 m.

1.11 Flight recorders and other recording devices

The plane was not equipped with devices recording flight parameters. CCTV footage from an industrial camera, which recorded the course of the landing, was available to the Committee.

1.12 Wreckage and impact information



1.13 Medical and pathological information

No crew member was injured during the incident.

1.14 Fire

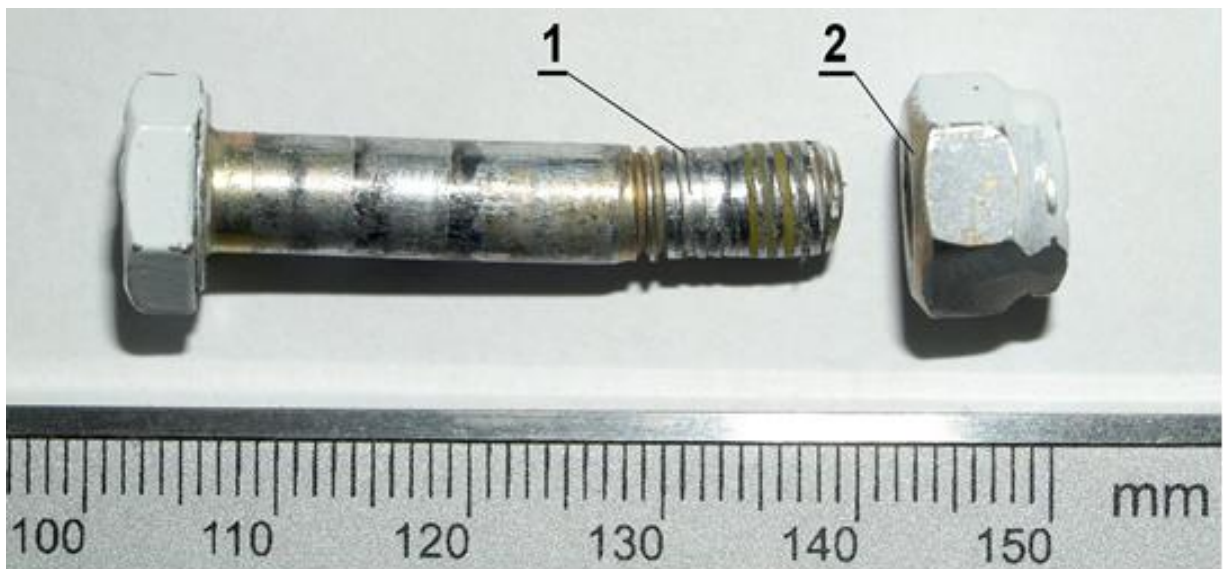
None.

1.15 Survival aspects

Search and rescue using SAR equipment was not necessary.

1.16 Tests and research

The self-locking nut and bolt connecting the landing gear leg and front landing gear wheel underwent investigation at the Institute of Forensic Science.



Bolt and self-locking nuts submitted for investigation



Detail view of the damaged bolt thread



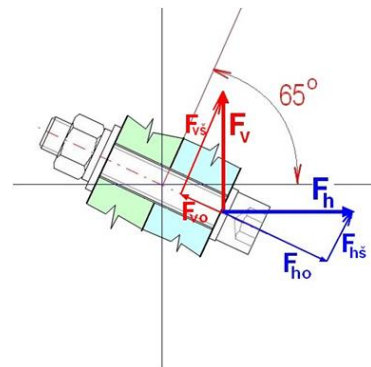
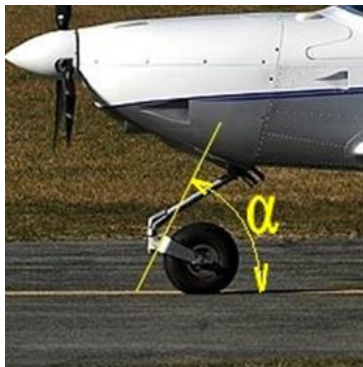
"Smoothed" internal nut thread

According to the technical specifications of the relevant joint in the front landing gear leg system in aircraft type PS-28 Cruiser, AN174-12A bolts and AN365-428 self-locking nuts should have been used in the joint.

AN174-12A bolts are standard steel bolts used in aviation. They are made of Steel Comp 4140, Steel Comp 8740, Steel Comp 8630, Steel Comp 8735, Steel Comp 4130 or Steel Comp 4037. Their Rockwell hardness should have a value within the interval $HRC = 26$ to 32 (depending on the material used). The Rockwell hardness test (method C) was carried out on the hexagonal head of the provided bolt with the result being $HRC = 26$, i.e. the hardness (and thus strength) of the relevant bolt falls within the specified interval.

AN365-428 self-locking nuts are made of Steel AISI 1137 with a tensile strength of $R_m = 585$ MPa and a prescribed hardness of $HB = 174$ (Brinell hardness). It follows from the steel hardness conversion table that such hardness corresponds to the Rockwell hardness $HRC \approx 9$. It was found using a laboratory durometer that the hardness of the examined nut was $HRC = 13$. The hardness testing showed that the investigated nut complied with the declared hardness (and thus also strength), and even slightly exceeded it.

From the perspective of strength, the investigated bolt and nut complied with the declared hardness for AN174-12A bolts and AN365-428 nuts. Damage to the relevant bolted connection between the landing gear leg and the fork therefore did not occur due to insufficient strength of the materials of the bolts and nuts (provided that the remaining five bolts and nuts had comparable mechanical and strength properties), but due to overloading the relevant joint with an excessive load.



At the time of damage, the relevant bolted joint was overloaded with horizontal backward force as demonstrated by the actual bending of the landing gear leg backwards.



1.17 Organizational and management information

The flight activity was carried out in accordance with aviation regulations applicable in the Slovak Republic.

1.18 Additional information

The pilot underwent a breathalyser test with negative results.

1.19 Useful or effective investigation techniques

Conventional methods of investigation were used.

2. ANALYSIS

Pilot action

The pilot flew the aircraft by bringing it to approach phase for landing at a higher speed and, despite being aware of this and trying to reduce the speed by extending the landing flaps to the maximum level possible, he underestimated the situation due to lack of experience, did not realise the potential consequences and tried to land the aircraft on three points. After the front landing gear touched the runway, the aircraft bounced up several metres, which was immediately followed by several more bounces that ended in breaking the front landing gear. After the landing gear broke, the nose of the aircraft dropped onto the runway surface, the propeller broke and the plane slid on the grass surface. After the aircraft stopped, the crew left the plane with no injuries.

3. CONCLUSIONS / Cause of Serious Incident

3.1 Findings

Pilot

- Had valid qualifications for flights in the given aircraft category according to the documentation submitted;
- Had little flight experience;
- At the time of the incident was not under the influence of alcohol, drugs or conventional drugs that could reduce attention during the flight.

Aircraft

- Had valid documentation and did not show any defects before the incident;
- In terms of strength, the screw and nut complied with the declared values of hardness and strength.

3.2 Causes of serious incident

Improper calculations for landing and higher approach/landing speed combined with little flight experience.

4. SAFETY RECOMMENDATIONS

The final report of the investigation of the serious incident does not contain any recommendations.

Bratislava, 22/11/2016