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

MINISTRY OF TRANSPORT, CONSTRUCTION AND REGIONAL DEVELOPMENT OF THE SLOVAK REPUBLIC

Aviation and Maritime Investigation Authority
Námestie slobody 6, P.O.BOX 100, 810 05 Bratislava 15

Reg. No.: SKS2013007

F I N A L R E P O R T

on investigation of serious incident

of aircraft type **WT-9 Dynamic**

Registration No. **OM-AKM**

Place: 22.08.2013

Place: Airport Martin / LZMA

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

Type of aircraft:	WT-9 Dynamic
Registration No:	OM-AKM

Owner:	AKB Martinská kaliareň, s.r.o. ČSA 3/1697, 036 57 Martin
Operator:	SNA, ul. Pri Rajčianke 49, Žilina
Take-off site:	LZMA
Planned landing site:	LZMA
Type of operation:	general aviation / sport and recreational flying
Flight phase:	glider towing at the Airport LZMA
Date and time of serious incident:	22.08.2013, 15:30

Note: All time data in this report are stated in the UTC time.

B. INFORMATIVE SUMMARY

On 22.08.2013 at 15:30 the pilot with aircraft WT-9 Dynamic towed a glider from the grass runway ("RWY") 36 of airport LZMA. During the flight the pilot noticed vibrations of the engine and the cockpit being filled with smoke. The pilot made a forced landing on RWY18 of the airport LZMA.

The aircraft was not damaged and the pilot was not injured during the forced landing.

The commission composed of the following members was appointed for investigation of the incident:

Ing. Juraj GYENES
Jaroslav JUSZCZUK

The report is issued by:
Aviation and Maritime Investigation Authority
of the Ministry of Transport, Construction and Regional Development
of the Slovak Republic

C. MAIN PART OF REPORT

1. FACTUAL INFORMATION

1.1 History of the flight

On 22.08.2013 the pilot with aircraft type WT-9 Dynamic, Registration No. OM-AKM, conducted several glider towing operations. During the last towing operation at 15:30 in a altitude of 350-400 AGL, the pilot observed engine vibrations and the cockpit being filled with smoke, showing signs of fire. The pilot decided to terminate the towing operation and signalled his decision to the glider pilot who disconnected the cable. The pilot then managed the situation in accordance with the engine fire fighting procedures. Having received the information about aircraft fire through the radio communication, the pilot increased the flight speed, successfully extinguished the fire and made a forced landing. The pilot landed with aircraft on RWY18 of the airport LZMA without further damage to the aircraft.

Daytime: day
Flight rules: VFR

1.2 Injuries to persons

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

1.3 **Damage to aircraft**

No damage was detected on the airframe other than pollution of the aircraft surface from a large oil leak. The following inspection detected a destruction of the engine caused by puncturing the engine block.

Fig. 1 Oil leak

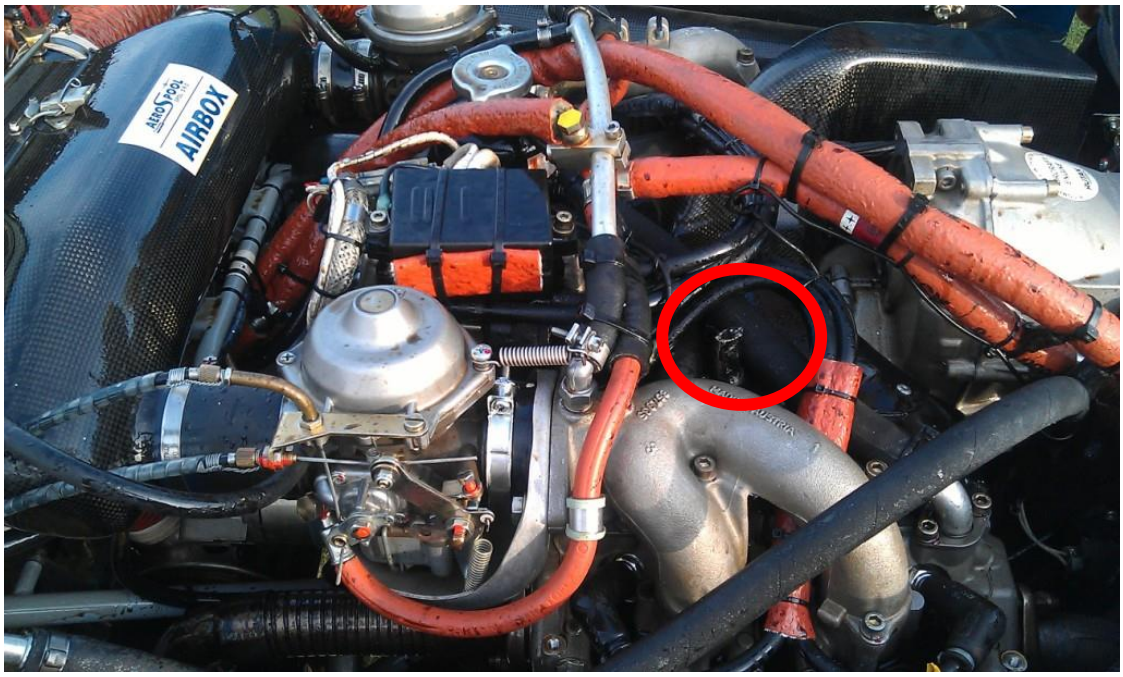

Fig. 2 Punctured engine block

Fig. 3 Punctured engine block, fragment of connecting bar No 3 of the engine cylinder

1.4 Other damage

No circumstances with potential claims for compensation of other damage toward a third party were notified to the Aviation and Maritime Investigation Authority.

1.5 Personnel information

Pilot:

National of the Slovak Republic aged of 58 years
Holder of the CPL(A) commercial pilot licence issued by the issued by the Civil Aviation Authority of the Slovak Republic on 20.06.1986.
Medical certificate of 2nd class with marked validity until 01.10.2013.

Qualifications:

FI(A)	with marked validity until	31.03.2016
SEP(L)	with marked validity until	28.02.2014

Glider towing with aircraft type WT-9 Dynamic with marked validity from 09.09.2005

Flying experience:

Total flight hours:	3558:39 h	19 276 flights
For the last 90 days:	12:37 h	61 flights
On the critical day:	0:56 h	6 flights

1.6 Information about aircraft

a) Airframe

Type:	WT-9 Dynamic
Registration No:	OM-AKM
Serial No:	DY-267/2008
Year of manufacture:	2008
Manufacturer:	Aerospool Prievidza, SR
Total operating hours:	913:46 h
Total number of takeoffs:	4165

Release to service: CRS No. 02M/SGC/13 of 26.07.2013, at 899:28 h.

The certificate of airworthiness No. 0937, issued by the Civil Aviation Authority of the Slovak Republic on 30.7.2008, with marked validity until 18.10.2013.

b) Engine

Type:	ROTAX 912 S2
Serial No:	4.923.710
Year of manufacture:	2008
Manufacturer:	ROTAX Aircraft Engines

1.7 Meteorological situation

N/A.

1.8 Aids to navigation

N/A.

1.9 Communication

The aircraft was equipped by radiocommunication equipment enabling two-way radio communication with all air stations at every moment of flight.

1.10 Information about airport

LZMA is a public domestic airport with irregular traffic and RWY 18/36 with dimensions 800x50 m and grass surface. The airport was suitable for the flight operation of the respective aircraft type.

1.11 Flight recorders

N/A.

1.12 Wreckage and impact information

N/A.

1.13 Medical and pathological information

N/A.

1.14 Fire

The puncturing of the engine block and oil leak from the engine caused fire in the aircraft, which was extinguished by the pilot during the flight.

1.15 Aspects of survival

N/A.

1.16 Tests and research

Engine condition assessment

The aircraft engine was subject to an expert examination at the manufacturer of engine ROTAX for assessment of its overall condition. The engine manufacturer in report No. 501 of 11.04.2014 stated the following:

"Findings"

- Insufficient pressure oil lubrication, damaged crankcase bearings, connecting rod bearings No 1, 3 and 4 and magnet bearing
- Insuffucient engine lubrication – low oil pressure
- Oil pump without apparent functional abnormalities, working with required pumping efficiency.

"Conclusions"

- Rupture of the connecting-rod eye of gudgeon pin No 3 – puncturing of the engine block due to the insufficient lubrication of the gudgeon pin bushing No 3,
- The engine pressure lubrication system showing no apparent defects
- No possibility of detection of the cause of insufficient engine lubrication
- Estimated causes of insufficient engine lubrication:

  Inssufficient quantity of oil

  Incorrectly installed oil hoses

  Hose blocking, oil leak.

Engine oil analysis

The oil sample taken from the engine was tested by the company for production, distribution and servicing of lubrications MOL-LUB, s. r. o. - laboratory WEARCHECK.
The analysis detected oil contamination by fuel of viscosity class SEA 10W-40, type AERO SHELL Sport Plus 4. The lead content stemming from a foreign substance or indicating abrasion of bearing.

Oil level assessment

A petrol sample was sent for analysis to EUROFINS BEL/NOVAMANN s.r.o – accredited test laboratory in Bratislava. The fuel analysis showed that the destillation test and the octane number of fuel were conforming the standard STN EN 228.

Engine overhaul

The engine overhaul was conducted within the required scope in accordance with recommendations of the engine manufacturer at the authorized organization L-3-055/SK SGC s.r.o Martin.

The engine overhaul with oil replacement was conducted on 26.07.2013 pri 899:28 hod.

On 31.07.2013 the engine repair was conducted at company TEVESO, s.r.o., CR, CZ145-0045, replacement of starter overruning clutch.

Subsequently, the engine was mounted on the frame of aircraft L-3-055/SK SGC s.r.o Martin.

1.17 **Organizational and management information**

The flight of the aircraft was conducted in accordance with the licence and procedures of the aircraft operator.

1.18 **Additional information**

N/A.

1.19 **Useful or effective investigation techniques**

Standard investigation techniques were used.

2. ANALYSIS

The airworthiness of the aircraft was controlled by the aircraft operator who controlled the continuing airworthiness and maintenance of the aircraft in accordance with recommendations of the aircraft manufacturer – holder of the type certificate and issued service bulletins (SB) and orders for continuing airworthiness (AD).

The aircraft operator used the recommended type of petrol and engine oil. The checks were conducted at an authorized organization and recorded in the technical file/aircraft documentation.

The investigation and the engine condition assessment did not detect the causes of insufficient engine lubrication, which resulted in destruction of the engine and fire on the aircraft.

3. C O N C L U S I O N S / CAUSE OF SERIOUS INCIDENT

3.1 Findings

Aircraft

- The aircraft had valid certificate of airworthiness.
- The maximum take-off weights were not exceeded.
- The aircraft operator controlled the continuing airworthiness and maintenance of the aircraft in accordance with recommendations of the aircraft manufacturer.
- The aircraft was in good condition and fulfilled the airworthiness conditions for the critical flight.

Crew of aircraft

- The pilot had valid qualifications for the critical flight.

3.2 Causes of serious incident

The probable cause of the serious incident was insufficient engine lubrication.

4. SAFETY RECOMMENDATIONS

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

Bratislava, 30.06.2014