SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9357		
Aircraft Registration	**ZS-GVE**	**Date of Accident**	13 September 2014		**Time of Accident**	0845Z	
Type of Aircraft	Scheibe SF 25 B(Glider)		**Type of Operation**		Training (Part 141)		
Pilot-in-command Licence Type		National Pilot Licence	**Age**	62	**Licence Valid**	Yes	
Pilot-in-command Flying Experience		Total Flying Hours	833.31		Hours on Type	680	
Last point of departure	Springs Airfield (FASI): Gauteng Province						
Next point of intended landing	Springs Airfield (FASI): Gauteng Province						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
At Springs Airfield boundary to the left of Runway 03 (GPS coordinates S 26° 14' 154.86" E 028°23' 44,28"); Elevation 4495 feet							
Meteorological Information	Wind: Light and Variable; Temperature: 26° C; Visibility :CAVOK						
Number of people on board	2	**No. of people injured**	2	**No. of people killed**	0		

Synopsis

The instructor and the student pilot were conducting an introductory training flight at FASI. The flight was conducted under visual meteorological condition at day time. Good weather conditions prevailed at the time leading to the accident. The instructor stated that they took off from Runway 03, whilst on a climb overhead the threshold at 150 ft above ground level (AGL) the aircraft engine lost power and stopped. The instructor stated that he tried to restart the engine by checking fuel lock on, fuel pump on and pulling the choke. The engine restarted for few seconds and stopped again. The aircraft right hand wing dropped and the aircraft rotated to the right and faced the threshold of Runway 21. The aircraft suddenly dropped its nose and the right wing of the aircraft turned sharply right and impacted the fence and crashed.

The investigation revealed that due to fuel starvation caused by the failure of the mechanical fuel pump. The pilot then attempted to return to the airfield for a forced landing and stalled the aircraft resulting in an incipient spin. There was nothing wrong with the secondary electrical pump. It was then further concluded that fuel mismanagement contributed to the accident. Both occupants sustained serious injuries.

Probable Cause

Unsuccessful forced landing after take-off due to engine stoppage as a result of fuel starvation.

SRP Date	14 November 2017	Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner	**:** Golf Victor Echo Gliding Syndicate CC
Name of Operator	**:** East Rand Gliding Club
Manufacturer	**:** Scheibe
Model	**:** SF 25B
Nationality	**:** South African
Registration Marks	**:** ZS-GVE
Place	**:** At Springs Airfield boundary to the left of Runway 03
Date	**:** 13 September 2014
Time	**:** 0845Z

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (2011) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to establish blame or liability****.*

Disclaimer:

This report is produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On the 13 September 2014 the instructor accompanied by a student pilot took-off from Runway 03 at FASI on an introductory flight with the intention to land back at the same airfield. The flight was conducted under visual meteorological conditions at day time. Good weather conditions prevailed at the time leading to the accident.

1.1.2 The pre-flight checks were completed and the aircraft taxied to the threshold of Runway 03 without any event. The instructor stated that the take-off was normal until at about 150ft AGL overhead the threshold of runway 21 when the engine

suddenly lost power.

1.1.3 The instructor reported that after the engine lost power he reinitiated start by checking fuel lock on, fuel pump on and pulling the choke lever. The engine restarted for few seconds and stopped again. The engine then shuddered and the right hand wing dropped and the aircraft rotated to the right entering an incipient spin and faced the threshold of Runway 21. The instructor further reported that the aircraft suddenly dropped its nose and the right wing of the aircraft turned sharply right and impacted the perimeter fence and crashed. The instructor and the student sustained injuries and were attended to and taken to the hospital and the aircraft sustained substantial damage during the accident.

1.1.4 The accident happed on a day light condition at Springs Airfield with GPS coordinates S 26° 14’ 154.86” E 028°23’ 44.28”.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	1	1	-	-
Minor	-	-	-	-
None	-	-	-	-

1.3 Damage to Aircraft

1.3.1 The aircraft sustained substantial damage during the accident.

Figure 1: Shows picture of ZS-GVE courtesy of Google.

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information (The glider instructor)

Nationality	South African	Gender	Male	Age	62
Licence Number	0279005094	Licence Type	National pilot license		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Grade B flight Instructor				
Medical Expiry Date	01 June 2015				
Restrictions	Corrective lenses				

1.5.1 Flying Experience:

Total Hours	833.31
Total Past 90 Days	10.16
Total on Type Past 90 Days	9.1
Total on Type	680

1.6 Aircraft Information

1.6.1 Airframe:

Type	Scheibe SF 25B	
Serial Number	4687	
Manufacturer	Scheibe	
Date of Manufacture	1972	
Total Airframe Hours (At time of Accident)	391.01 (hobb meter last entry of flight folio)	
Last MPI (Date & Hours)	16 June 2014	1413
Hours since Last MPI	Unknown	
Authority to Fly (ATF) (Expiry Date)	15 June 2015	
C of R (Issue Date) (Present owner)	18July 2007 Golf Victor Echo Gliding Syndicate CC	
Operating Categories	NTCA Commercial	

Engine

Engine Part number	VW LIMBACH 1800CC	
Engine Serial number	SFAS567008	
Total hours	1413 (At the time of ATF renewal)	
Last MPI (Date & Hours)	16 June 2014	1413

1.7 Meteorological Information

1.7.1 The weather report (METAR) was obtained from the Braam Fischer International Airport tower.

Wind direction	Variable	Wind speed	Light and variable	Visibility	CAVOK
Temperature	26° C	Cloud cover	CAVOK	Cloud base	Nil
Dew point	Unknown				

1.8 Aids to Navigation

1.8.1 The glider was equipped with standard navigational equipment as per Equipment list approved by the Regulator. There were no recorded reported defects to navigational equipment prior to the flight.

1.9 Communications.

1.9.1 The aircraft was equipped with VHF transmitter communication equipment as per equipment list approved by the Regulator. There were no recorded defects to communication equipment prior to the flight.

1.10 Aerodrome Information

1.10.1

Aerodrome Location	Springs Aerodrome		
Aerodrome Co-ordinates	S 26° 14’ 154.86” E 028°23’ 44,28”		
Aerodrome Elevation	5340ft		
Runway Designations	03/21	04/22	14/32
Runway Dimensions	1600X18	500X20	554X20
Runway Used	03		
Runway Surface	Asphalt		
Approach Facilities	No		

1.11 Flight Recorders

1.11.1 The glider was not fitted with a Flight Data Recorder (FDR) or Cockpit Voice Recorder (CVR) nor was it required by the regulator.

1.12 Wreckage and Impact Information

1.12.1 During take-off from Runway 03 at FASI was normal and climbed to 150feet (AGL) when the aircraft experienced engine power loss and stopped. The pilot restarted

the engine for few seconds and then it shuddered and stopped again. The pilot turned to the left to avoid the built up area on the right hand side. The aircraft then entered an incipient spin at or below 150ft AGL with insufficient altitude to recover the aircraft dropped its nose and the right wing of the aircraft turned sharply to the right and impacted the fence and crashed.

1.12.2 The right wing was completely detached and partially destroyed about 1.5m from the root. The left wing had impact damage on the leading edge near the tip. The canopy was shattered and pieces of it were laying in the direction of impact.

1.12.3 The propeller was damaged and the damages revealed signs of no rotation on propeller blade tips caused by impact forces.

1.13 Medical and Pathological Information

1.13.1 The pilot and a passenger sustained serious injuries.

1.14 Fire

1.14.1 There was no evidence of pre or post impact fire.

1.15 Survival Aspects

1.15.1 The accident was considered survivable because the cockpit structure was still intact and both the occupants made use of the safety harness. The damages were limited to the destruction of the nose section and wings.

1.16 Tests and Research

1.16.1 After the accident the aircraft engine was taken to the approved person (AP) for tests and analysis. The following findings were discovered by the AP.

Observation:

Prior to removing the engine from the wreck, it was noted that the pilot reported that after the initial power loss he applied choke and the engine picked up power for a short time. This led me to believe the failure occurred some were within the fuel system. There was about 20 litres in the tank enough fuel for about 2 hours flight time with the engine running.

I. The fuel system

The fuel supply from the tank, including the vent in the cap was checked for

obstruction, no fault was found. The fuel gravitated on test at 1.0 litre per minute from the tank out through the tap and fuel filter. The glass bowl filter had no sediment in it. Power was connected to the electrical circuit of the pump and switched on. The pump did not run. After the engine was removed and excess to the electric fuel pump was possible, I noted that the earth wire from the pump had been broken off. There was little doubt that the earth wire had been broken in the accident as the wire was too short to reach the pump in the position it had ended up in after the accident. The outlet from the pump had also been snapped off. It was also noted that the pump switch had power through it on the initial test. The pump switch was found in the on position as was the turn and bank switch right next to it. The pilot could not confirm he heard the pump running prior to take off. The mechanical fuel pump was found accident damaged & broken. The pivot pin (critical to its function) for its rocker was missing this certainly would have stopped it from working. There was evidence that it had gone missing prior to the flight as there was dust in the appalure where it should have been. These pins are pressed in and peened over at the time of manufacturing of the pump. A test revealed that fuel did gravitate through the pump at significant rate to taxi the air craft. This would not have been the case in the climb out as the nose of the aircraft is raised in relation to the fuel tank. This would allow the a/c to be taxied bit would fail on the climb. The carburetor was dismantled and inspected. The diaphragm was found in good order. There were no obstructions found. It was noted that there was no fuel in it but consideration must be given to the fact it laid horizontal after the accident which would have caused it to drain.

II. *Ignition system*

Magneto was found intact, tested and found to be operational. It had not disengaged from the engine. The electronic ignition system independently driven was found to be intact and operational. Its coil was destroyed in the accident and could not be tested. All wiring connection were intact no reason found to cause its failure. There for both systems were fully operational.

III. *Engine mechanical*

Although the engine sustained some accident damage prior to the stripping compression on all cylinders were checked and found correct. This could not be measured as it was only possible to turn the engine by hand. This ruled out any possible failure in the valve train cam systems and pistons and cylinders. The cylinder heads were removed, it is noted there were no abnormalities found.

IV. *Conclusion*

The engine failed to produce power due to fuel exhaustion. Primary cause failure of the mechanical fuel pump. Why the secondary electrical pump failed to provide fuel, we will never know as there were no faults found.

1.17 Organizational and Management Information

1.17.1 This was an introductory flight for the Ab-initio training for the student on his first flight.

1.17.2 According to the available records, the last annual inspection was carried out on 16 January 2014 by an approved aircraft maintenance organisation (AMO) and was in possession of a valid AMO approval.

1.18 Additional Information

1.18.1 None.

1.19 Useful or Effective Investigation Techniques

1.19.1 None

2. ANALYSIS

2.1 Man

2.1.1 The instructor was demonstrating introductory flight to the student when the accident occurs. The instructor stated that after take-off while climbing the engine stopped. He tried to restart the engine by checking fuel lock on, fuel pump on and pulling the choke. The engine restarted for few seconds and stopped again. He then opted to turn back to land on runway 21 which was eventful.

2.2 Machine

2.2.1 The pilot take-off from Runway 03 at FASI was normal and climbed to 150 feet (AGL) when the aircraft experienced engine power loss and stopped. The pilot restarted the engine for few seconds and then it shuddered and stopped again. The pilot turned to the left to avoid the built up area on the right hand side. The aircraft then entered an incipient spin at or below 150ft AGL with insufficient altitude to recover the aircraft dropped its nose and the right wing of the aircraft turned sharply to the right and impacted the fence and crashed.

The aircraft engine was recovered and subjected to teardown inspection by the AP and the AP concluded that the engine failed to produce power due to fuel starvation which was caused by the failure of the mechanical fuel pump. The reason for the

mechanical fuel pump failure was undetermined. There were no recorded snags on the flight folio prior to the flight.

2.3 Environment

2.3.1 The weather information was extracted from the pilot questionnaire. The weather at the time of the accident was reported as light and variable and did not contribute to the accident.

3. CONCLUSION

3.1 Findings

3.1.1 The pilot held a valid national pilot licence with the aircraft type endorsed on it.

3.1.2 The pilot was the holder of a valid class 4 medical certificate with restrictions.

3.1.3 The aircraft had a valid Authority to fly and a Certificate of Registration at the time of the accident.

3.1.4 The aircraft was maintained by an approved AMO with a valid approval from by the regulator.

3.1.5 After take-off while climbing the engine stopped due to fuel starvation.

3.2 Probable Cause/s

3.2.1 Unsuccessful forced landing after take-off due to engine stoppage as a result of fuel starvation.

4. SAFETY RECOMMENDATIONS

4.1 None.

5. APPENDICES

5.1 None