AIRCRAFT INCIDENT SHORT REPORT

CA18/3/2/1265: The aircraft failed to rotate due to overweight; the take-off was aborted but the aircraft could not stop and it overshot the runway before impacting a parameter fence.

Date and time	:	20 May 2019; 1210Z
Aircraft registration	:	ZU-LSC
Aircraft manufacturer and model	:	Czech Aircraft Works, SPOL SRO
Last Point of departure	:	Brits Aerodrome (FABS)
Next point of intended landing	:	Brakpan Aerodrome (FABB)
Location of incident site with reference to easily defined geographical points (GPS readings if possible)	:	S25°31'56,4" E027°'46'29,45'' Brits Aerodrome (FABS)
Meteorological Information	:	Surface wind: 110°at 5 knots; Temperature: 25°C; Cloud cover: none
Type of operation	:	Private
Persons on board	:	1 + 1
Injuries	:	0
Damage to aircraft	:	Propeller, wings and landing gear

All times given in this report are Coordinated 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 apportion blame or liability.***

Disclaimer:

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

1. SYNOPSIS

1.1 On 20 May 2019 at approximately 1210Z, a pilot and a passenger intended to take-off from Brits Aerodrome (FABS) to Brakpan Aerodrome (FABB) for a private flight. The pilot reported that as he accelerated on Runway 20, he tried to rotate at 65 knots (kts) but was unsuccessful. He decided to abort take-off and applied full brakes, however, the aircraft overshot the runway and impacted the aerodrome perimeter fence.

1.2 The investigation revealed that after the aircraft reaching the rotation speed of 65kts, the aircraft couldn't rotate due to its weight being in excess by 7.7lb above the maximum certified take-off weight of 1320lb. The take-off was aborted; however, the aircraft could not stop on the remaining runway and it overshot the runway and collided with the aerodrome perimeter fence.

2. FACTUAL INFORMATION

2.1 On 20 May 2019 at approximately 1210Z, a pilot and a passenger intended to depart FABS on a private flight to FABB. The pilot reported that as he accelerated on Runway 20 and when the aircraft reached 65kts, he tried to rotate but the aircraft could not rotate. The pilot aborted take-off and applied full brakes, however, the aircraft overshot the runway and collided with the aerodrome perimeter fence. The private flight was conducted in accordance with the South African Civil Aviation Regulations Part 94 (operation for non-type certificated aircraft).

Figure1: The aircraft as it came to rest.

2.2 The pilot and the passenger sustained no injuries. The aircraft had minor damage to the propeller blades, spinner, right-hand wing and right-hand main wheel.

2.3 The flight was conducted under visual meteorological conditions (VMC) by day. The incident site was at the following Global Positioning System (GPS) coordinates: 25° 31′ 56.4″S 27° 46′ 29.45″E at an elevation of 3 740 feet (ft) above mean sea level (AMSL). Fine weather conditions prevailed prior to the incident.

2.4 The runway length at FABS is 835 metres (m). The pilot reported that he started his ground roll at the beginning of the runway. The aircraft required to have a ground roll of 141m to attain rotation speed of 65kts.

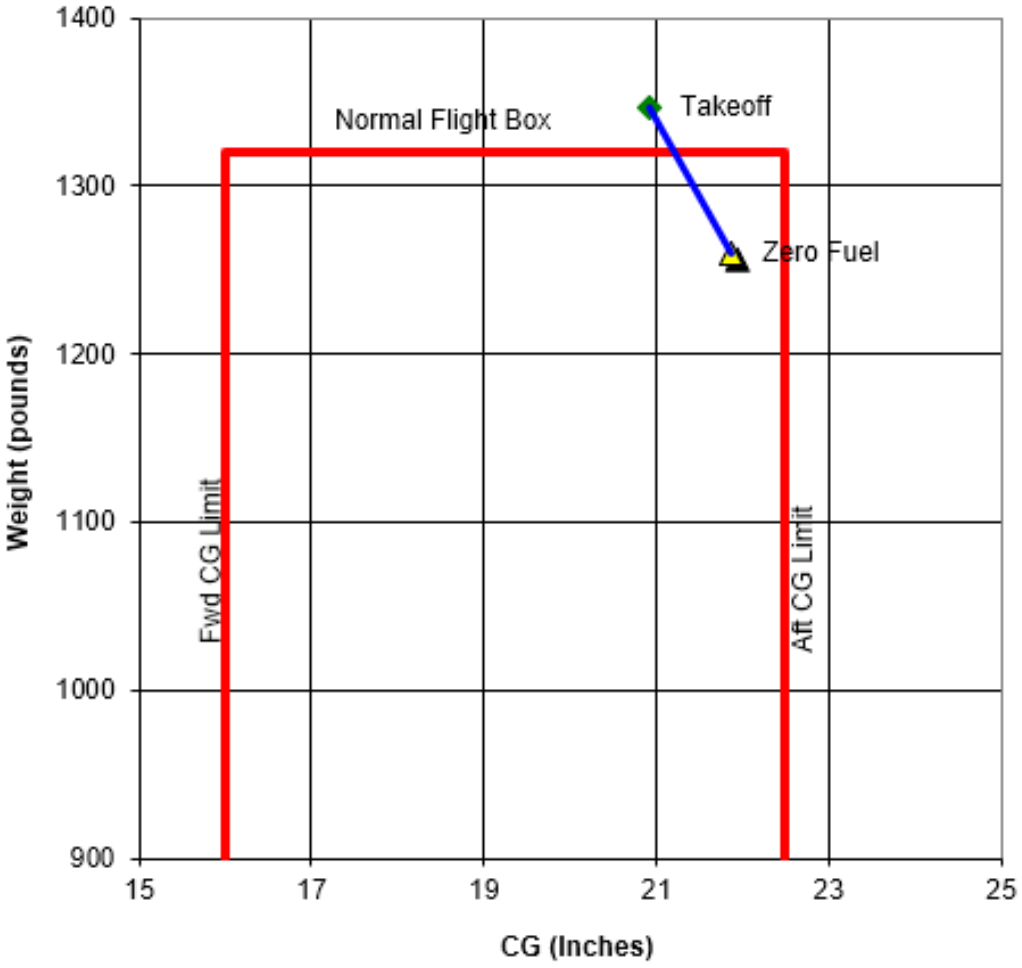
2.5 **Weight and Balance:**

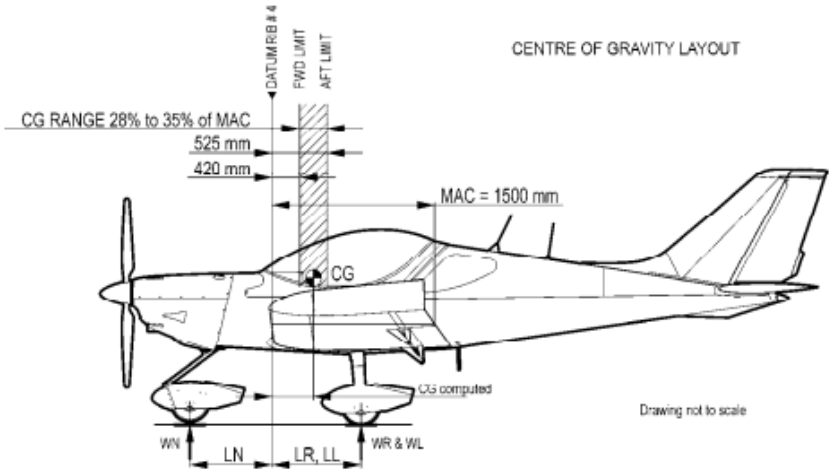
Item	**Weight (lbs)**	**Arm**	**Moment**
Aircraft	358kgx2.2=787.6*lb*	18.7	14728.12
Pilot weight	128kg x 2.2 =281.6*lb*	27.56in	7760.9
Passenger weight	78kg x 2.2 =171.6*lb*	27.56in	4729.3
Fuel	55*l* x 1.58 = 86.9*lb*	7.09in	616.1
Total	1327.7*lb*		27834.42

2.5.1 Maximum certified take-off weight for this aircraft is 1320lb and the aircraft was in access by 7.7lb.

2.5.2 **Centre of Gravity: Moment ÷ Weight**

27834.42 ÷ 1327.7 = 21





6.5 C.G. range and determination

6.5.1 Aircraft C.G. range:

Empty weight C.G. range..... *28.5 to 29.5 %* of MAC
16.83 to 17.42 in of MAC

Operating C.G. range ..... *28 to 35 %* of MAC
16.54 to 20.67 in of MAC

2.10 Operating weights and loading

Max. takeoff weight..... *1,320 lb*

Max landing weight..... *1,320 lb*

Max. weight of fuel..... *180 lb*

Max. baggage weight in rear fuselage ..... *40 lb*

Max. baggage weight in each wing locker ..... *22 lb*

Empty weight (minimum equipment)..... *805 lb*

NOTE

Actual empty weight is shown in Section 9, Supplement No. 02

WARNING

Do not exceed maximum takeoff weight 600 kg.

Number of seats *2*

Minimum crew *(only on the left seat)* ..... *1* pilot

Minimum crew weight ..... *121 lb*

Maximum crew weight on each seat..... *253 lb*

3. FINDINGS

3.1 The pilot held a valid national pilot licence (NPL) and the aircraft type was endorsed on it. The pilot successfully completed his skills test on 1 March 2019. The licence was issued on 18 March 2019 and due to expire on 17 March 2021.

3.2 The pilot held a valid class 4 aviation medical certificate which was issued on 15 May 2019 and due to expire on 31 May 2021.

3.3 The pilot had approximately 2 094.9 flying hours of which 373.8 were on type.

3.4 The aircraft had a valid Certificate of Registration (C of R) issued on 4 December 2013.

3.5 The aircraft had a valid Authority to Fly (ATF) issued on 18 December 2018 and due to expire on 14 December 2019.

3.6 The last annual inspection had been carried out on 15 December 2018 at 701 airframe hours.

3.7 The aircraft had flown 13 hours since its last annual inspection.

3.8 The aircraft had 55 litres of fuel on-board.

3.9 The centre of gravity was beyond the operating range limit of between 16.54 and 20.67. The calculated centre of gravity was 21.

3.10 Fine weather conditions prevailed on the day of the incident.

3.11 Maximum certified take-off weight for this aircraft is 1320lb and at the time of take-off, the aircraft weight was calculated at 1327.7lb which was 7.7lb over weight.

3.12 The aircraft sustained damage to the propeller blades, spinner, undercarriage and the wings.

3.13 After the incident, the pilot inspected the aircraft flight control surfaces and found no anomalies with the aircraft.

3.14 The FABS runway length is 835 metres and the pilot reported that he rotated from the beginning of the runway.

3.15 The investigation could not determine why the pilot aborted take-off as there was nothing wrong with the aircraft and its systems.

3.16 The investigation revealed that after the aircraft reaching the rotation speed of 65kts, the aircraft couldn't rotate due to its weight being in excess by 7.7lb above the maximum certified take-off weight of 1320lb. The take-off was aborted; however, the aircraft could not stop on the remaining runway and it overshot the runway and collided with the aerodrome perimeter fence.

4. PROBABLE CAUSE CONTRIBUTING FACTOR

4.1 During take-off, after reaching rotation speed at 65 kts, the aircraft couldn't rotate due to exceedance of maximum take-off weight by 7.7 lb, the pilot aborted the take-off however the aircraft overshot the runway and collided with the aerodrome perimeter fence

5. CONTRIBUTING FACTOR

5.1 Late decision to abort the take-off run.

6. REFERENCES USED ON THE REPORT

6.1 Pilot's Operating Handbook.

7. SAFETY RECOMMENDATION

7.1 None.