SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-41

AIRCRAFT ACCIDENT SHORT REPORT

CA18/2/3/9840 Loss of control after touchdown.

Date and time	:	29 November 2019; 1600Z
Aircraft registration	:	ZU-JVN
Aircraft manufacturer and model	:	Glasair Aviation LLC; Sportsman GS-2
Last point of departure	:	Diemskraal Aerodrome, Western Cape
Next point of intended landing	:	Porterville Aerodrome, Western Cape
Location of accident site with reference to easily defined geographical points (GPS readings if possible)	:	On Porterville Runway 35 at S33°01'37.14" E018°59'58.04" at an elevation of 650 feet
Meteorological information	:	32012KT 9999 FEW025 22/14 Q1012 NOSIG=
Type of operation	:	General Aviation (Part 91)
Persons on-board	:	1+0
Injuries	:	None
Damage to aircraft	:	Substantial

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 apportion blame or liability.***

Disclaimer:

SRP Date: 11 August 2020 **Publication Date:** 12 August 2020

1. SYNOPSIS

1.1 On 29 November 2019, the pilot on-board a Sportsman GS-2 aircraft with registration marks ZU-JVN took off on a private flight from Driemskraal Aerodrome in the Western Cape province with the intention to land at Porterville Aerodrome in the same province.

1.2 At Portville Aerodrome, the aircraft was set to land on Runway 35. At the time, the wind was 320º at 12knots/22km/h and the aircraft's indicated airspeed was 55knots/102km/h. The aircraft touched down at the beginning of the runway. However, when the aircraft was on a landing roll halfway (440m) through the runway, it skidded and hit an embankment and a fence, which made the aircraft ground loop to the right of the runway, almost facing the opposite direction (it was travelling on). The aircraft sustained substantial damage and the pilot was not injured.

1.3 The investigation revealed that the pilot lost control of the aircraft after touchdown due to an unstable approach which was likely caused by the aircraft's approach speed (55 knots) being lower than the required minimum speed (60-65 knots) stipulated by the aircraft's manufacturer.

2 FACTUAL INFORMATION

2.1 History of flight

2.1.1 On 29 November 2019, a pilot on-board a Sportsman GS-2 aircraft took off from Diemskraal Aerodrome in the Western Cape province on a private flight to Porterville Aerodrome, also in the Western Cape province. The flight to Porterville Aerodrome was uneventful.

2.1.2 According to the pilot, he was on approach for Runway 35 at Porterville Aerodrome with a cross wind of 12knots/22km/h at an indicated speed of 55knots/102km/h. The runway length and width are 880m and 30m, respectively. The pilot stated that he touched down without any incident at the beginning of the runway. The ground roll was at an approximate speed of 20knots/37km/h.

2.1.3 The pilot stated that halfway down the runway (440m), he tried to apply brakes to bring the aircraft to a halt, but the aircraft continued to skid sideways along the gravel runway until the aircraft's left landing gear impacted a small embankment alongside the runway. The aircraft subsequently impacted a perimeter fence and came to a halt. During the investigation, the pilot further explained that during the ground roll when the aircraft was halfway through the runway, there was a gust of wind from the right-hand side that hit the aircraft's tail section, causing it (aircraft) to ground loop approximately 90° to the right of the centreline.

2.1.4 The aircraft sustained substantial damage to the left-hand main landing gear, left wing tip and the propeller. The pilot was not injured in the accident sequence.

2.1.5 The investigation revealed that the pilot lost control of the aircraft after touchdown due to an unstable approach which was likely caused by the aircraft's approach speed (55 knots) being lower than the minimum required speed (60-65 knots) as stipulated by the aircraft's manufacturer.

Figure 1: The location where aircraft came to a stop. (Source: Pilot)

Figure 2: Starboard view and the ground scars leading to the perimeter fence. (Source: Pilot)

2.1.6 Upon examination of Figure 2, the aircraft probably landed close to the threshold, but the pilot most likely lost directional control, which resulted in the aircraft veering to the right-hand side of the runway with the left main landing gear in contact with the runway's surface, while the right main landing gear was airborne. The right main landing gear eventually touched down while the aircraft was still heading for the embankment on the right side of the runway. The right main landing gear then impacted the embankment as the aircraft was approaching (the embankment) at an angle. At this point, the tail landing gear had still not touched down as there were no visible marks on the runway's surface. This sequence of events then resulted in the aircraft pivoting on its vertical axis, making a ground loop.

2.1.7 The accident occurred during daylight at Porterville Aerodrome on Runway 35 at Global Positioning System (GPS) co-ordinates determined to be 33°01’37.14” South 018°59’58.04” East at an elevation of 650 feet above mean sea level (AMSL).

Figure 3: Overlay of the accident site. (Source: Google Earth)

3 Additional Information

3.1 The pilot had completed familiarisation training on the X326 Sportsman GS-2 aircraft on 25 November 2019. On the day of the accident, the pilot had flown 1.2 hours dual, and the aircraft type was endorsed on his logbook. The pilot had accumulated a total of 439.1 hours; and 12 hours were on the aircraft type, according to the logbook. The hours in the logbook were divided as follows: 25 November 2019, 1.5 hours dual; 25 November 2019, 4.8 hours self; 26 November 2019, 2.7 hours self; 28 November 2019, 1.3 hours self; 29 November 2019, 0.7 hours self (day of the accident).

Crosswind component chart. (Source: FAA Airplane flying hand book H-8083-3B)

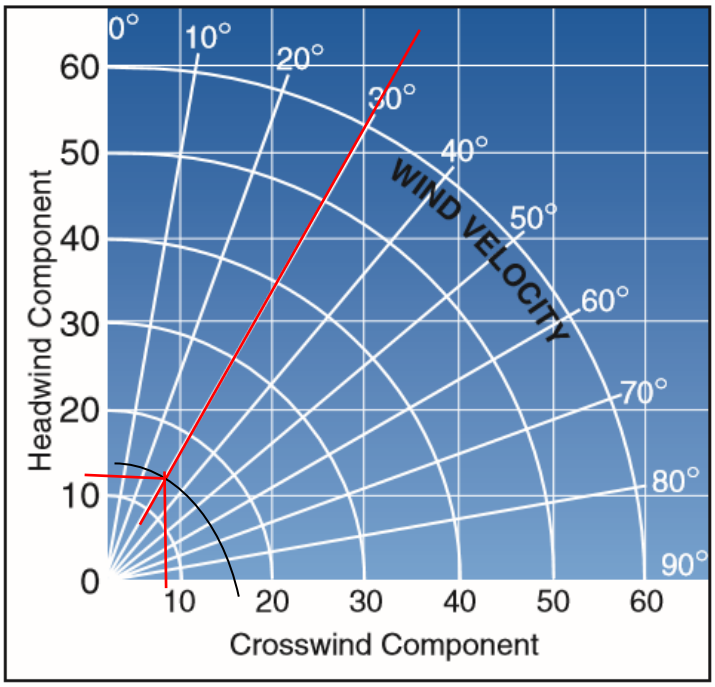

Figure 4: The wind component graph on the day of the accident.

3.1.1 The pilot stated that he landed on Runway 35 with the wind at 320º at 12knots/22km/h and with an indicated speed of 55knots/102km/h. The pilot touched down at the beginning of the runway without any incident, but halfway down the runway when the pilot tried to slow down the aircraft, he stated that the aircraft skidded and then ground looped. The weather report from the South African Weather Service (SAWS) supplied by METAR for Cape Town International Aerodrome (FACT) was: 32012KT 9999 FEW025 22/14 Q1012 NOSIG=. The weather information used for the calculation of the headwind and the crosswind (below) was from the pilot's questionnaire as FACT was situated 61 nautical miles (nm) from the accident site, but the wind direction and speed were the same.

3.2 To obtain headwind and crosswind calculations on Runway 35, the wind was 320 which gave a resultant heading of 30 degrees (350-320=30). The resultant wind direction was used to plot the graph (Figure 4) which gave the resultant headwind of 11 knots and a crosswind component of 8 knots. The weather was not considered a factor in this accident as the crosswind was not strong enough to blow the aircraft off course during the landing roll as the pilot had stated.

3.3 Figure 2 indicates that the aircraft was probably rolling with the left main landing gear while the right main landing gear was airborne. The right-hand landing gear then made contact with the runway while the aircraft was still rolling towards the embankment on the right-hand side of the runway. There was no evidence of the tail wheel being in contact with the runway's surface as there were no visible marks on the runway. The aircraft was approaching the embankment at

an angle before it collided with it. The right main landing gear then impacted the embankment first, causing the aircraft to pivot on its vertical axis to the left of the runway.

3.4 Figure 3 indicates that the aircraft's position after impact with an embarkment was abeam a set of trees next to the runway. The distance from the beginning of the runway to the position of the aircraft was 310m. According to the Pilot's Operating Handbook (POH), short-field landing can be achieved at distances of between 200m and 243m without hard braking on a heavy aircraft.

3.5 Although the Sportsman GS-2 landed in extremely demanding crosswind conditions, no maximum demonstrated crosswind component is published for this aircraft type. (Source: Glassair Sportsman Operations Manuals)

3.5.1 ***Taxiing*** *(Source: Glassair Sportsman Operations Manuals)*

Since visibility over the nose is excellence, taxiing the Sportsman is easier than in many other tailwheel-equipped airplanes. Steering is by cables connected between the rudder yoke and the tailwheel. Above about 13kts, (15 m.p.h./24km/h) IAS, the rudder begins to become effective for directional control. It is best to keep the speed well under control while taxiing and to taxi defensively when in the vicinity of other ground traffic. In most conditions, taxi with the stick in the full aft (elevator up) position. This keeps weight on the tailwheel for positive steering and helps guard against nose-overs when braking. To break the tailwheel-locking mechanism loose for a pivot turn, however, push the stick forward to lightened the tail and tap the brake on the side you're turning to. In strong crosswinds, hold aileron into wind while taxiing.

3.5.2 ***CROSSWINDS*** (Source: Glassair Sportsman Operations Manuals)

Normal crosswind landing procedures for conventional aircraft apply to the Sportsman. Especially strong crosswinds require either a crab into the wind and straightening out just before touchdown or a side slip, or a combination of the two methods. The maximum crosswind that can be handled in the Sportsman is highly dependent on pilot proficiency and technique. Therefore, although the Sportsman has been landed in extremely demanding crosswind conditions, no maximum demonstrated crosswind component is published for the aircraft. Each pilot is urged to practice crosswind landing tasks of progressive difficulty and to honestly assess his/her own capability along with that of the aircraft.

3.5.3 *Unstable approach (Hot and High)*

When the final approach is too high, lower the flaps as required. Further reduction in power may be necessary, and control usage, the airplane may sink rapidly, contacting the ground with a hard impact. (Source: FAA Airplane flying handbook H-8083-3B*)*

3.6 Following the investigation, two possible hypotheses were explored that may have caused loss of control after touchdown:

- Unstable approach.
- Incorrect technique used during ground roll.

3.7 Approach Pattern (Source: Glassair Sportsman POH)

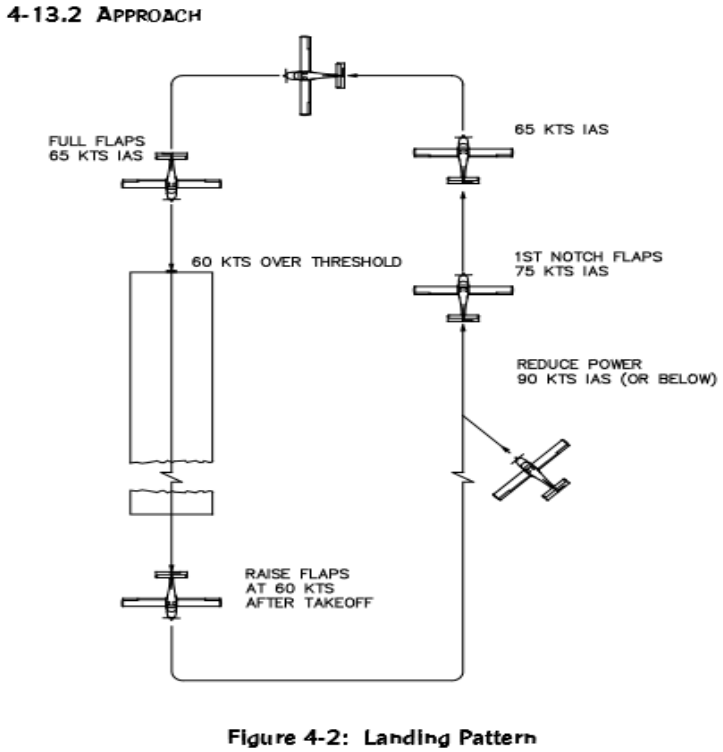

Figure 5: Diagram showing landing pattern. (Source: Glassair Sportsman POH)

3.7.1 *Enter the pattern on the 45˚ at about 90 kts. (144km/h). Pull the carb heat (if installed) for 15-30 seconds to check for ice. Push the mixture full rich (or enrich as appropriate for altitude) and move the prop control forward to the high r.p.m (flat pitch) position (if applicable). Abeam the numbers on downwind and extend the first notch of flaps and slow to 75 kts (120km/h)*

Note

Because the Sportsman is very clean aerodynamically, speed changes in the pattern must be anticipated earlier and accompanied by greater changes in power setting than many pilots may be accustomed to.

Continue slowing the airplane to about 65kts. (104km/h) on the base leg. Throughout downwind, base and final, continue to trim the airplane as necessary. Maintain 65 kts (104km/h) onto final approach and add full flaps. Control altitude with power and airspeed with pitch.

Note

The sportsman can be landed with no flaps, half flaps or full flaps, and the recommended pattern speed remain the same regardless. However, full flaps will result in the slowest touchdown speed and will enhance control of the airplane in a three-point, full-stall landing attitude, so full flap landings are recommended under most circumstances. You should be about 60 kts. (111km/h) over the threshold under normal conditions. Carry little more airspeed if you are heavily loaded or in gusty or strong wind conditions.

Warning

If you don't like the way you're set up for landing, don't be ashamed or too proud to go around and try it again. It is much better to go around than to damage the plane or (injure) yourself.

Warning

When the Sportsman is flown at normal approach speed of 60-65kts. (111-120km/h) as described above, the airplane glides nicely to a gentle landing at minimum descent rate and with plenty of elevator power for the flare. At slower airspeeds, the power-off sink rate increases rapidly, and considerable engine power is required to arrest the descent sufficiently to flare for landing.

3.8 The investigation revealed that the pilot lost control of the aircraft after touchdown due to an unstable approach which was likely caused by the aircraft's approach speed (55 knots) being lower than the required (60-65 knots) minimum speed stipulated by the aircraft's manufacturer.

4 FINDINGS

4.1 The pilot was initially issued a Private Pilot Licence (PPL) on 31 July 2019 with an expiry date of 31 October 2020. His last competency check was done on 25 November 2019.

4.2 The pilot was issued a Class 2 aviation medical certificate on 24 April 2018 with an expiry date of 30 April 2020, with no restrictions.

4.3 The pilot accumulated a total of 439.1 hours, with 12 hours accumulated on the aircraft type, according to the logbook.

4.4 The last annual inspection was carried out on 8 November 2019 at 689 hours and the certificate of released to service (CRS) was issued on the same day with an expiry date of 8 November 2020 or at 789 hours, whichever occurs first. The aircraft had a total of 708.5 hours at the time of the accident and had operated for 19.5 hours since its last annual inspection.

4.5 The pilot stated that on the day of the accident while on approach, he was set to land on Runway 35 with the wind at 320º at 12knots/120km/h and an indicated speed of 55knots/102km/h. The aircraft touched down at the beginning of the runway without any incident. The wind direction and speed were the same as the one provided by the SAWS.

4.6 The aircraft approached the runway at a speed of 55kts/102km/h, which was lower than the required landing speed of 60-65kts (111-120km/h).

4.7 The aircraft was issued an authority to fly (ATF) certificate on 19 November 2019 with an expiry date of the 30 November 2020.

4.8 The left main landing gear was in contact with the runway's surface while the right landing gear was airborne. The right main landing gear then came into contact with the runway's surface while the tail landing gear was still airborne; this was indicated by the marks on the runway's surface. The aircraft was approaching the embankment at an angle; hence the right main landing gear impacted the embankment first and the aircraft pivoted on its vertical axis, making a ground loop.

4.9 The pilot was not injured during the accident sequence.

4.10 The weather was considered not a factor in this accident.

4.11 The crosswind component at the time of the accident was calculated to be 8 knots. There is no maximum demonstrated crosswind published for this aircraft type.

4.12 The investigation revealed that the pilot lost control of the aircraft after touchdown due to an unstable approach that was cause by the aircraft's approach speed (55 knots) which was lower than the required minimum airspeed (60-65 knots) stipulated by the manufacturer.

5 PROBABLE CAUSE

5.1 The pilot's loss of directional control during touchdown resulted in the aircraft's right main landing gear impacting the embankment and the aircraft pivoting on its vertical axis, making a ground loop.

5.2 **Contributary Factors**

5.2.1 Unstable approach; the aircraft approach speed (55kts) was lower than the minimum required speed (60-65kts).

6. REFERENCES USED ON THE REPORT

6.1 Pilot and Owner/Operator questionnaires.

6.2 FAA Airplane flying handbook H-8083-3B

6.3 Sportsman Operating manual

6.4 https://www.manualslib.com/manual/1392901/Glasair-Sportsman-Gs-2.html

7. SAFETY RECOMMENDATION

7.1 None.

8. ORGANISATION

8.1 The aircraft maintenance organisation (AMO) which carried out the service on the aircraft had an AMO certificate issued on 8 April 2019 with an expiry date of 7 April 2020.

9 TYPE OF SAFETY ACTION

9.1 None.

This Report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa