AIRCRAFT ACCIDENT SHORT REPORT

CA18/2/3/9693	:	**ZU-ZAN Investigation of a loss of control after landing**
Date and time	:	26 March 2018
Location	:	Morning Star Aerodrome
Occurrence Category	:	ACCID
Aircraft registration	:	ZU-ZAN
Aircraft manufacturer and model	:	Jabiru J400
Last Point of departure	:	Morning Star airfield
Next point of intended landing	:	Morning Star airfield
Location of accident site with reference to easily defined geographical points (GPS readings if possible)	:	S 33°45' 34.94" E 018° 31' 55.05", elevation 220 ft
Meteorological Information	:	Wind 220°at 10kt, temperature 22°C and visibility CAVOK
Type of operation	:	Private Part 94
Persons on board	:	1+2 persons on board
Injuries	:	None
Damage to aircraft	:	Substantial damage

All times given in this report is 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 accidents and ***not to establish blame or liability.***

Disclaimer:

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SYNOPSIS

On 17 March 2018, the pilot accompanied by two passengers on board departed from Morningstar airfield on a private flight with the intention to land back at Morningstar airfield. The flight was conducted in visual meteorological conditions (VMC). Good weather conditions prevailed at the time leading up to the accident.

The pilot stated that the approach was stable, with the usual cross wind effect from the right hand side. The pilot prematurely flared the aircraft causing the aircraft to balloon; this in turn caused the aircraft to hit the ground hard. During the impact and landing roll the aircraft veered off to the left of the runway, the pilot corrected by using rudder to steer to the right to re-enter the runway. During the process to recover the right wing tipped and made contact with the ground. The pilot managed to get airborne and climb out for a go around.

The second approach was stable and the flare was more controlled, but on touch down when the main gear touched the ground the left hand side gear collapsed and the aircraft veered to the left of the runway, followed by the right main gear collapsing and the propeller hitting the ground. No injuries were reported by the pilot.

FACTUAL INFORMATION

The pilot accompanied by 2 passengers took off from Morning Star airfield on a private flight with the intention of landing back at the same airfield. Good weather condition prevailed at the time leading to the accident. The surface wind condition as reported by the pilot was 230° at 10-12 knot (kt). The flight was conducted under visual flight rules (VFR).

The pilot stated that he was lined up for approach to runway 20. The approach was stable as he descended down to the runway with a slight cross wind from the right. He further stated that he flared at a height of 10-15 feet (ft) above ground level (AGL). During touchdown with main undercarriage the aircraft bounced. The aircraft was plummeted onto the runway. A loud noise was heard by the pilot. He gave full power to correct for the bounce and go-around. He further stated that he pushed right rudder instead of left rudder to compensate for the cross wind. The aircraft veered to the left, and he used ailerons to bank to the right to re-enter the runway.

He stated that the right wing and elevator had tipped towards the ground, he corrected with left rudder, raised the flaps and climbed out for the go-around.

The pilot stated that the second approach was stable and flare was more controlled. When the main landing gear touched the runway, the left gear collapsed. The pilot tried to maintain directional control with little success. The aircraft veered off to the left of the runway. The aircraft exited the runway, subsequently collapsing the right main landing. The aircraft skidded and came to rest approximately 350ft from the edge of the runway. The propeller came into contact with the ground.

The aircraft was substantially damaged on the undercarriage, the right wing and right elevator scratched, tail undercover cracked and the propeller tips damaged. The occupants were not injured.

A later interview with the pilot revealed that he had flared too high, resulting in the aircraft bouncing. The recovery from the bounce was mismanaged.

The pilot was involved in a similar occurrence on July 2017, when a gust of wind lifted the right wing just before touchdown. The aircraft slammed hard with a loud bang on the runway. The pilot taxied back to the hanger, and on inspection he discovered that the fuselage skin was cracked and the nose wheel strut was damaged. The aircraft was recovered to an approved AMO, where repairs were carried out and the aircraft put back into service by an approved person.

Round Out *(Airplane Flying Handbook FAA-8083-3B)*

The round out is a slow, smooth transition from a normal approach attitude to a landing attitude, gradually rounding out the flightpath to one that is parallel with, and within a very few inches above, the runway. When the airplane, in a normal descent, approaches within what appears to be 10 to 20 feet above the ground, the round out or flare is started. This is a continuous process until the

airplane touches down on the ground. As the airplane reaches a height above the ground where a change into the proper landing attitude can be made, back elevator pressure is gradually applied to slowly increase the pitch attitude and angle of attack (AOA). [Figure 1] This causes the airplane's nose to gradually rise toward the desired landing attitude. The AOA is increased at a rate that allows the airplane to continue settling slowly as forward speed decreases. When the AOA is increased, the lift is momentarily increased and this decreases the rate of descent. Since power normally is reduced to idle during the round out, the airspeed also gradually decreases. This causes lift to decrease again and necessitates raising the nose and further increasing the AOA.

During the round out, the airspeed is decreased to touchdown speed while the lift is controlled so the airplane settles gently onto the landing surface. The round out is executed at a rate such that the proper landing attitude and the proper touchdown airspeed are attained simultaneously just as the wheels contact the landing surface. The rate at which the round out is executed depends on the airplane's height above the ground, the rate of descent, and the pitch attitude. A round out started excessively high must be executed more slowly than one from a lower height to allow the airplane to descend to the ground while the proper landing attitude is being established. The rate of rounding out must also be proportionate to the rate of closure with the ground. When the airplane appears to be descending very slowly, the increase in pitch attitude must be made at a correspondingly slow rate. Visual cues are important in flaring at the proper altitude and maintaining the wheels a few inches above the runway until eventual touchdown. Flare cues are primarily dependent on the angle at which the pilot's central vision intersects the ground (or runway) ahead and slightly to the side.

Proper depth perception is a factor in a successful flare, but the visual cues used most are those related to changes in runway or terrain perspective and to changes in the size of familiar objects near the landing area, such as fences, bushes, trees, hangars, and even sod or runway texture. Focus direct central vision at a shallow downward angle from 10° to 15° toward the runway as the round out/flare is initiated. [Figure2] Maintaining the same viewing angle causes the point of visual interception with the runway to move progressively rearward as the airplane loses altitude. This is an important visual cue in assessing the rate of altitude loss. Conversely, forward movement of the visual interception point indicates an increase in altitude and means that the pitch angle was increased too rapidly, resulting in an over flare. Location of the visual interception point in conjunction with assessment of flow velocity of nearby off-runway terrain, as well as the similarity of appearance of height above the runway ahead of the airplane (in comparison to the way it looked when the airplane was taxied prior to takeoff), is also used to judge when the wheels are just a few inches above the runway. The pitch attitude of the airplane in a full-flap approach is considerably lower than in a no-flap approach.

To attain the proper landing attitude before touching down, the nose must travel through a greater pitch change when flaps are fully extended. Since the round out is usually started at approximately the same height above the ground regardless of the degree of flaps used, the pitch attitude must be increased at a faster rate when full flaps are used; however, the round out is still be executed at a rate proportionate to the airplane's downward motion. Once the actual process of rounding out is started, do not push the elevator control forward. If too much back-elevator pressure was exerted, this pressure is either slightly relaxed or held constant, depending on the degree of the error. In some cases, it may be necessary to advance the throttle slightly to prevent an excessive rate of sink or a stall, either of which results in a hard, drop-in type landing. It is recommended that a pilot form the habit of keeping one hand on the throttle throughout the approach and landing should a sudden and unexpected hazardous situation require an immediate application of power.

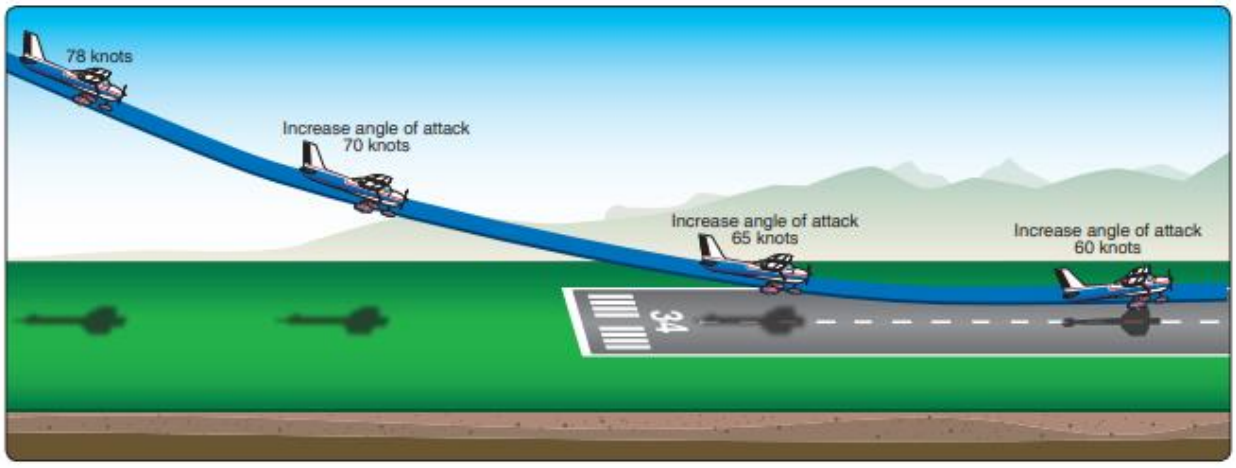

Figure 1: Changing angle of attack during round out.

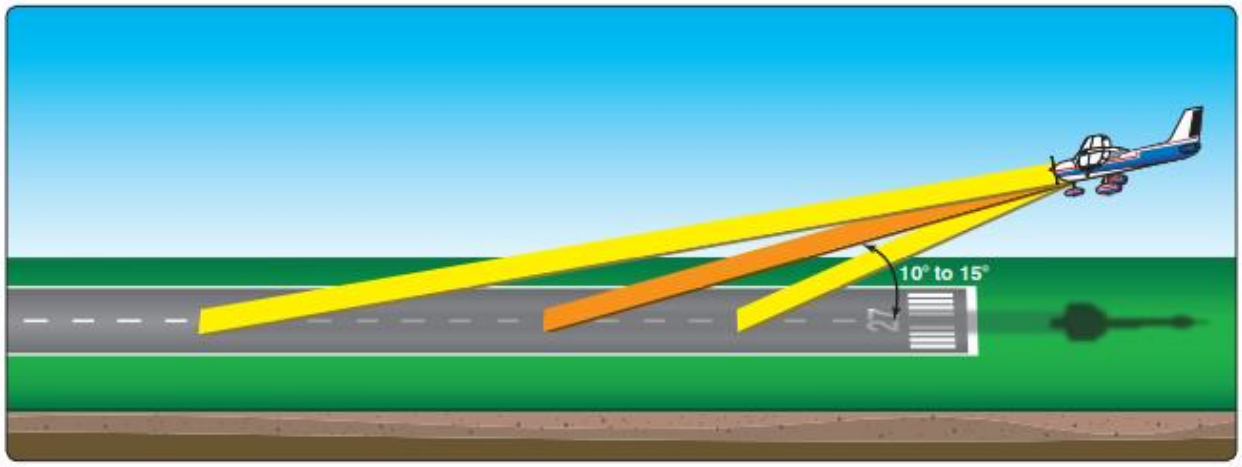

Figure 2: To obtain necessary visual cues, the pilot should look toward the runway at a shallow angle.

Figure 3: Shows the aircraft after recovery picture courtesy of the Rick Mey.

Figure 4: Shows damage on the nose gear.

Figure 5: Shows damage on the right wing.

1.1 Investigation revealed the following:

1.1.1 The pilot was the holder of a valid Private Pilot Licence and the aircraft type was endorsed on his licence.

1.1.2 The pilot was the holder of a valid aviation Medical Certificate issued by a designated medical examiner with restrictions.

1.1.3 The aircraft was issued with a valid Authority to Fly Certificate and certificate of release to service.

1.1.4 The last maintenance inspection prior to the accident flight was certified on 28 August 2017 at 743.3 airframe hours by an approved AMO.

1.1.5 The prevailing weather conditions had no influence on the accident.

1.1.6 The investigation revealed that the aircraft bounced and landed hard, resulting in the undercarriage collapsing and causing the aircraft to skid and exit the runway. The bounce resulted from flaring/rounding out too high and incorrect recovery techniques used for go around.

PROBABLE CAUSE/CONTRIBUTING FACTOR

Rounding out too high, resulting in the aircraft bouncing, causing the undercarriage to collapse and the aircraft to veer off to the left of the runway.

Contributing factor

Incorrect recovery technique used after the bounce.

Mismanagement of control inputs.

REFERENCES USED ON THE REPORT

Airplane Flying Handbook FAA-H-8083-3B

SAFETY RECOMMENDATION

None

ORGANISATION

As a result of this occurrence, the aircraft operator has advised the AIID that he is taking the following safety actions: He is proactively requested the instructor who did his conversion to fly with him for several hours of dual training in order to mitigate the problem areas.

SAFETY MESSAGE

None