DUTCH
SAFETY BOARD

Loss of control during touch-and-go

Piper PA-28-181

Loss of control during touch-and-go

Piper PA-28-181

The Hague, February 2022

The reports issued by the Dutch Safety Board are open to the public and available on www.safetyboard.nl.

Cover photo: Dutch Safety Board

The Dutch Safety Board

When accidents or disasters happen, the Dutch Safety Board investigates how it was possible for these to occur, with the aim of learning lessons for the future and, ultimately, improving safety in the Netherlands. The Safety Board is independent and is free to decide which incidents to investigate. In particular, it focuses on situations in which people's personal safety is dependent on third parties, such as the government or companies. In certain cases the Board is under an obligation to carry out an investigation. Its investigations do not address issues of blame or liability.

Dutch Safety Board

Chairman: J.R.V.A. Dijsselbloem
S. Zouridis
E.A. Bakkum

Secretary Director: C.A.J.F. Verheij

Visiting address: Lange Voorhout 9
2514 EA The Hague
The Netherlands

Postal address: PO Box 95404
2509 CK The Hague
The Netherlands

Telephone: +31 (0)70 333 7000

Website: safetyboard.nl
E-mail: info@safetyboard.nl

N.B:
This report is published in the English language, with a separate summary in the Dutch language. If there is a difference in interpretation between the Dutch and English language, the English language will prevail.

CONTENTS

SUMMARY

On 7 September 2019, PH-LAG, a Piper PA-28-181, took off from Breda International Airport (Seppe) for a local training flight. On board were an instructor, a student and a passenger. During a touch-and-go, the aircraft did not gain altitude and crashed just outside the aerodrome boundary. One of the three occupants, the student, was slightly injured, the aircraft was damaged beyond repair.

No clear agreements had been made before and during the instruction flight on who would steer the aircraft during the touch-and-go. The instructor stated that he would make the landing, while the student thought he was going to perform the touch-and-go. Simultaneous steering inputs on the yoke of both the flight instructor and the student lead to an aft held position of the yoke, and with that a nose's high attitude and high angle of attack during the touch-and-go.

As a result, the takeoff roll caused a considerable amount of drag that could not or hardly by compensated by engine power and consequently lead to a takeoff with the airspeed being too low. When the aircraft ultimately became airborne at low altitude, the aircraft banked, struck the ground with the right wing, made a 180 degree-turn and came to rest outside the borders of the airport.

The high mass of the aircraft and the aft center of gravity had a negative effect on the flight characteristics of the aircraft.

Following the accident, the flying school has taken measures to prevent instructors from instructing on types of aircraft with which they have limited experience.

ABBREVIATIONS

°C	Degrees Celsius
CG	Centre of gravity
CPL(A)	Commercial Pilot Licence (Aeroplane)
EHSE	Breda International Airport
EHWO	Woensdrecht Air Base
FI(A)	Flight instructor (Aeroplane)
hPa	Hectopascal
IAS	Indicated airspeed
kt(s)	Knot(s)
LAPL	Light Aircraft Pilot Licence
lb(s)	Pound(s)
METAR	Meteorological Aerodrome Report
PPL	Private Pilot Licence
QNH	Atmospheric pressure, converted to mean sea level
RPM	Rotations per minute
SEP(land)	Single Engine Piston (land)
SP-SE	Single Pilot – Single Engine

GENERAL OVERVIEW

Identification number:	2019075
Classification:	Accident
Date, time of occurrence:	7 September 2019, 10.20 hours[1]
Location of occurrence:	Breda International Airport, the Netherlands (EHSE)
Registration:	PH-LAG
Aircraft type:	Piper Aircraft Corporation PA-28-181
Aircraft category:	Single engine piston
Type of flight:	Flight training
Phase of operation:	Touch-and-go
Damage to aircraft:	Destroyed
Flight crew:	Two
Passengers:	One
Injuries:	One occupant slightly injured
Other damage:	Fence partly destroyed
Light conditions:	Daylight

1 All times all local times unless otherwise mentioned.

1 FACTUAL INFORMATION

1.1 General

On 7 September 2019, the Piper PA-28-181, with registration PH-LAG, took off from Breda International Airport for a local training flight. On board were an instructor, a student and a passenger. During a touch-and-go at the airport, the aircraft did not gain altitude and crashed just outside the aerodrome boundary. One of the three occupants was slightly injured. The aircraft was damaged beyond repair.

The occurrence was classified as an accident for which a safety investigation obligation applies for the state of occurrence, under Regulation (EU) No 996/2010 and the Kingdom Act Dutch Safety Board.

The investigation answers the following key question: What caused the aircraft to crash?

1.2 History of the flight

The flight was an instruction flight. The instructor, the student and a passenger (the student's son) met each other at the flying school at Breda International Airport. It was the ninth flight of the student and it was the first time he would fly with this instructor. The previous flights he made with two other instructors alternately. The plan was to fly aerial manoeuvres and after completing, fly back to the airport and practice circuit flying and some touch-and-go's. It was the first time that the student would exercise touch-and-go's.

In preparation for the flight, the instructor had studied the student's progress file. The instructor had also made the weight and balance calculation in advance, but when they met each other, it turned out that he had underrated the weights of the student and passenger, resulting in a new calculation. After he had made the new calculation, it turned out that the total mass of the aircraft was close to the maximum takeoff mass, yet both the mass and centre of gravity remained within the limits as stated in the pilot's operating handbook.

The instructor and student performed the flight preparation and discussed the planned flight. The weight and balance calculations were not discussed. They checked the weather forecast and after that, the aircraft was checked. Both fuel tanks contained fuel at a rough estimate of 16 gallons left and 18 gallons right. The engine oil was also checked and deemed all in order.

At 09.32 hours the aircraft took off from runway 25 for the instruction flight. The instructor was sitting on the right front seat, the student on the left front seat and the passenger in the back seat on the left side. The student performed the takeoff and after leaving the circuit, he flew in northerly directions where manoeuvres such as turns, steep turns and stalls were exercised for 30 minutes. After these exercises the student flew back to the airport for some touch-and-go's. According to the statement made by the instructor, it was agreed that the student would enter the circuit area, where he would fly the standard circuit and continue the final leg up until an altitude of 100 feet. At that altitude the instructor stated he would take over the controls and land the aircraft, followed by a takeoff. The student would also hold the yoke to feel the instructor controlling the aircraft during the touch-and-go. The instructor did not make arrangements with the student as to when he would take over the controls again. According to the student's statement, he was of the opinion that he would make the touch-and-go and that the instructor would take over if necessary.

As instructed, the student entered the circuit and followed it until turning to final of runway 25. After turning to final leg, the student selected flaps to 40 degrees and adjusted the attitude of the aircraft. Because the aircraft flew higher than planned, the instructor instructed the student to reduce power in order to reach the correct altitude with an airspeed of 75 kts. The student followed this instruction and at an altitude of 100 feet the instructor took over the controls. The instructor closed the throttle and lowered the nose of the aircraft to keep the demanded airspeed. The student was still holding the yoke, as agreed.

According to the instructor, the aircraft touched the runway further as planned, around intersection T1 (see Figure 3 on page 14) with an airspeed of around 60 kts. At that moment, the instructor felt that the student pulled the yoke, resulting in a nose-up attitude of the aircraft that became airborne again. The instructor lowered the nose immediately, resulting in the aircraft landing again. He then selected 10 degrees of flaps, deselected carburettor heat and selected full power. The instructor stated that the aircraft became airborne with an airspeed of around 70 kts, but did not accelerate in the usual manner. He therefore lowered the nose of the aircraft again to gain more airspeed. This did not succeed, after which the aircraft touched the runway again.

Finally the aircraft became airborne again. At that moment the aircraft reached the final part of the runway at low altitude, floating to the left side of the runway. Realizing that the aircraft would not become airborne normally, the instructor tried to avoid some buildings present on the left side of the runway, just outside the airfield. He succeeded, but the aircraft then banked heavily to the right, after which the right wing hit the ground. Ultimately, the aircraft made a 180 degree-turn and came to a rest in the sideway of a road, just outside the borders of the airport. The student suffered minor injuries. The aircraft was damaged beyond repair.

The student stated that during the flight he experienced that the instructor let him control the aircraft more than the other instructors used to do. The student also stated that he was of the opinion that he himself made the landing and that, after the aircraft hit the runway and became airborne again with a nose-up position, the instructor took over the controls. The student saw that the instructor tried to gain airspeed, but that the aircraft did not accelerate. During these attempts, he heard the stall warning almost constantly. During the touch-and-go, the student held the yoke continuously.

Footage

The airport is equipped with cameras. One of these cameras is aimed at the last part of runway 25 and had recorded most of the accident. The events are portrayed in Figure 1 (pictures 1-8) and represent a time frame of roughly 13 seconds. The eight pictures in Figure 1 portray the following events in the recordings:

- The recordings show around the last 300 metres of the runway and the area outside the airport where the aircraft crashed. From the moment the aircraft is visible on the recordings, it rolled over the runway in a nose-up position, with the nose wheel lifted from the surface (see Figure 1, pictures 1-2).
- Around 200 metres before the end of the runway, the aircraft's nose lifted a little more, where after the aircraft became airborne a little above the surface, still with a nose-up attitude (pictures 3-4).
- The aircraft banked a little to the left, consequently drifting to the left. Abeam the threshold of runway 07, it drifted left of the runway, touched the grass and rolled several metres on the grass (pictures 5-6).
- Abeam the end of the concrete, the aircraft became airborne again and after some metres of flying, the aircraft banked to the right and lost height. The right wingtip hit the ground, where after the aircraft crashed (pictures 7-8).

Figure 1: Images of the recorded camera footage of the crash. (Source: Breda International Airport)

1.3 Injuries to persons

The student suffered minor injuries and was examined in the hospital. The instructor and the passenger remained unhurt.

1.4 Damage to aircraft

Damage to the aircraft and examination
Both wings, the under carriage, the front including the propeller and the horizontal stabilizer of the aircraft were heavily damaged.

The primary control surfaces and controls of PH-LAG were examined and found working as normal, although their functioning was limited due to the damage. The elevator trim tab was found down, meaning *'nose up'*, but the elevator trim control in the cockpit was found in slightly *'nose down'* position. The flap control handle was found in the first detent, indicating 10° flaps, which matched with the found position of the wing flaps.

Both tanks contained fuel.

After the accident, the aircraft was transported to a maintenance organisation where it was superficially examined by maintenance personnel. No abnormalities, possibly related to the cause of the accident, were found.

Figure 2: The Piper after the crash. (Source: Dutch Safety Board)

1.5 Other damage

The aircraft ended up in a fence, which was partly destroyed as a result (see Figure 2).

1.6 Personal information

The instructor possessed a valid Commercial Pilot Licence (CPL(A)), with the ratings SEP(A), Night(A), FI(A) SP-SE, LAPL and PPL. He also possessed a valid Medical Certificate Class 1/Class 2/LAPL. His total flight experience was around 800 hours, on both multi and single engine aircraft and around 50 hours on the Piper PA-28. He worked as freelance instructor for the training organisation.

The student did not possess a pilot licence. He started his flying lessons on 13 April 2019. Until the accident flight he had made eight instruction flights with a total flying time of 7:50 hours. He made these eight flights with two different instructors. The last instruction flight before the accident flight was on 24 July 2019. The first seven flights, the instructors performed the takeoffs and landings and the student flew the aerial maneuvers. The first time the student made a takeoff himself was during the eighth flight on 24 July 2019. The next flight was the accident flight on 7 September 2019. As he had not flown for more than a month, the student stated that his flying skills were a bit 'rusty'.

1.7 Aircraft information

The Piper PA-28-181 is a single-engine, metal aircraft with conventional controls. The aircraft has a four-cylinder Lycoming O-360-A4M engine, 180 horsepower at 2,000 RPM, driving a two-bladed, fixed pitch propeller. Fuel is stored in two 25 gallon (24 gallons usable) fuel tanks, giving the aircraft a total capacity of 50 U.S. gallons (48 gallons usable).

The aircraft had an Airworthiness Review Certificate, valid until 14 December 2019. The last inspection (50 hours) was on 5 September 2019.

The basic empty weight of the aircraft was 1,636.36 lbs and the maximum takeoff weight was 2,550 lbs. According to the calculation the instructor made, the zero fuel mass of the aircraft was 2,352.5 lbs, added with a fuel weight of 174.4 lbs resulted in a takeoff mass of 2,527 lbs.

The Pilot's Operations Handbook (POH) PA-28-181 mentions several air speeds in relation to aircraft performance. The most relevant air speeds are:

Takeoff rotation speed, flaps 10°	52 – 65 kts IAS, depending on weight of the aircraft
Approach speed	75 kts IAS
Final approach speed, flaps 40°	66 kts IAS
Stall speed, flaps up, power off	59 kts IAS
Stall speed, flaps 40°, power off	53 kts IAS

1.8 Meteorological information

The Meteorological Aerodrome Report (METAR) of Woensdrecht Air Base (EHWO)[2], located around 18 kilometres of Breda International Airport, around the time of the accident stated good visibility values of more than 10 kilometres. The prevailing weather conditions were:

Wind: direction 270 degrees, speed 6 kts, variable between 230-300 degrees
Clouds: broken, base at 5,700 feet, overcast at 6,500 feet
Temperature/dew point: 15 °C / 12 °C
QNH: 1018 hPa

1.9 Aerodrome information

Breda International Airport Aerodrome (EHSE) is available for national and international civil air traffic with all types of aircraft up to 5,700 kg. The airport is equipped with a concrete runway 07-25 (see Figure 3). The runway has a total length of 830 metres. Due to a displaced threshold, runway 25 has an available landing distance of 754 metres. The distance from the end of runway 25 to the airfield border, is around 60 metres.

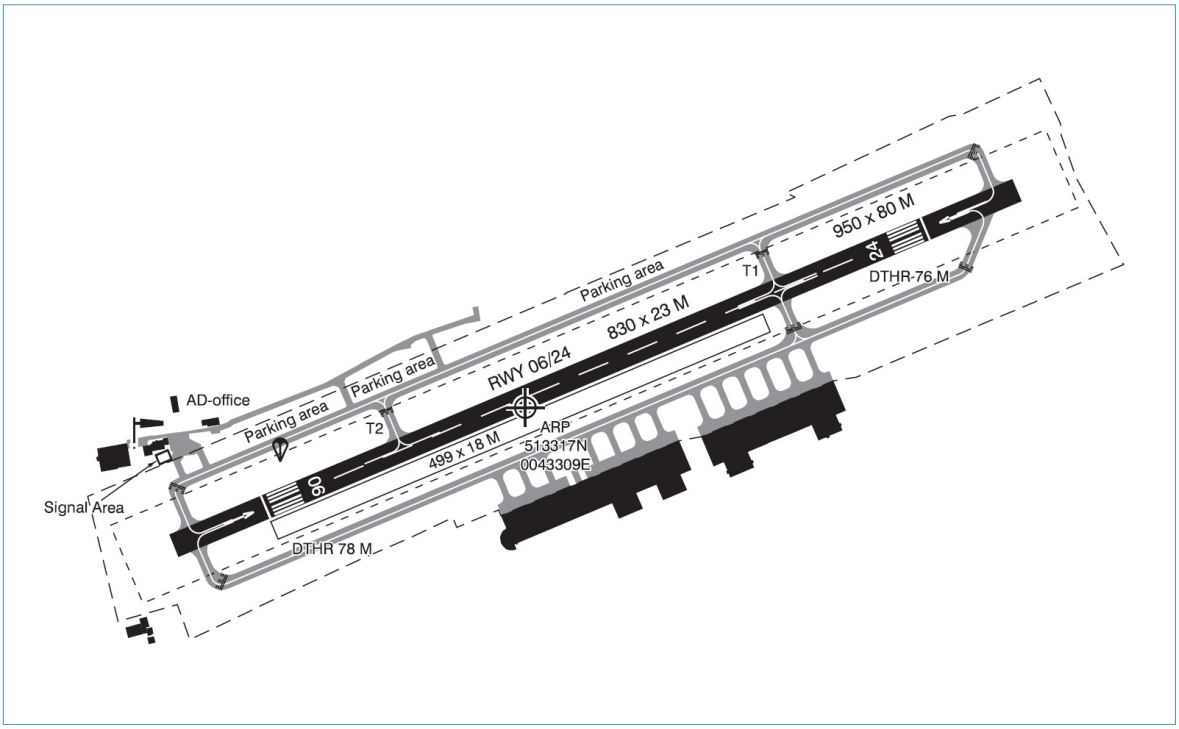

Figure 3: Aerodrome chart of Breda International Airport. (Source: Aeronautical Information Publication Netherlands)

2 METAR EHWO 070955Z AUTO 27006KT 230V300 9999 BKN057 OVC065 15/12 Q1018 BLU

1.10 Additional information

The flying school is an Approved Training Organisation (ATO). Instruction has been given according to the instruction syllabus PA-28 Archer. In the syllabus nineteen PPL-training modules are described and each module consists of several items. After satisfying completion of all modules, the student is ready for the practical examination.

The flying school keeps records of the progress of each student. These records are the observation time sheet and the exercise sheet. For each flight an observation time sheet is made, mentioning, amongst other things: flight number, date, name of the instructor, flight time and observations. In the last line, the items to be practiced on the next flight are mentioned.

The exercise sheet mentions all modules, as described in the syllabus, which a student needs to practice and master. Each item that has been practiced is recorded on the sheet. It is noted which item was practiced, how it was performed and on what date this was done. It depends on the progress of the student and the (weather) conditions which specific modules are practiced during an instruction flight. Each item can be qualified with: below standard, improving and standard. Touch-and-go's are not mentioned as item but are covered by two modules. Module 12 is *'takeoff and climb to downwind position'* and module 13 is *'circuit, approach and landing'*. Both modules consist of 0.30 hour theoretical and 1.00 hour practical (flight)training. According to the training sheet, both modules were not yet practiced during the student's previous flights.

The observation time sheet of the eighth flight of the student mentions that all exercises the student performed, were reviewed as standard. The items that were to be practiced the next flight (the accident flight) were: *'stall during turns'* and *'standard circuit' (droog oefenen*[3]*).*

3 Dry run, meaning theoretical practising the circuit procedures.

2 INVESTIGATION AND ANALYSIS

2.1 Instruction

The instructor was a freelance instructor. Although he had flown several types of aircraft, he had limited flying and instruction experience on a Piper PA-28, because freelance instructors of this flying school usually give instruction in another type of aircraft, namely a two-person aircraft.

The instructor and the student had not met before and this flight was the first flight for the instructor with this student. Consequently, the instructor obtained relevant information about the performance and progress of the student by studying the observation time and exercise sheets.

The maneuvers during the first part of the instruction flight were executed without peculiarities although the student experienced during the exercises that this instructor let him control the aircraft more independently than the previous instructors did.

The flight school manuals do not provide for the transfer of students, therefore each instructor can do this in his own way. This can lead to different ways of instruction by the instructors, which was the case in this flight. When receiving instruction from three different instructors during nine flights, each time the student had to get used to different methods of instruction. In a situation where instructor and student have not met before, it is important that the instructor explains the expectations of the flight instruction, the method of training and that clear agreements are made as to who is flying the aircraft during which phase of flight.

Instruction by another instructor led to a way of instruction the student was not used to.

After an evaluation of the accident with the PA-28, the flying school decided that freelance instructors were no longer allowed to give instruction in such four-person aircraft (unless a very extensive check out had taken place). The background to this decision was that freelance instructors have insufficient experience with four-person aircraft, because they usually give instruction in an Aquila, a two-person aircraft.

Following the accident, the flying school has taken measures to prevent instructors from instructing on types of aircraft with which they have limited experience.

2.2 Circuit flying and touch-and-go

The last observation time sheet from 24 July 2019 mentioned that during the next flight, the standard circuit would be practiced theoretically, the meaning of 'dry run'. However, the instructor chose to instruct circuit flying during the instruction flight. Consequently, the student had to practice the touch-and-go for the first time. The instructor also let him control the aircraft more than the other instructors had done before. All this was unusual to the student.

The statements of the instructor and the student regarding the agreements made and what happened during the circuit flying and the touch-and-go differ from each other. According to the instructor, the arrangement was made that the student would bring the aircraft to final. There, the instructor would take over control at 100 feet and land the aircraft, while the student would hold the controls to feel the movements the instructor made. However, the student was of the opinion that he would make the landing and that the instructor would instruct him and would intervene if necessary. Hence, both had a different expectation as to who would take which actions. Neither of them verified whether the arrangements were clear to one another.

On final, the student was holding the yoke, with the instructor giving him directions to make corrections to get on the right profile. At about 100 feet, the instructor took over control without saying the regularly used phrase *'I have control'*. That is why the student was of the opinion that he was still steering the aircraft, resulting in both holding the yoke and both individually thinking that he was controlling the aircraft.

Just before touch down, the instructor closed the throttle and the aircraft made a normal landing even though it landed further down the runway than planned. Without communicating, the student pulled the yoke. Pulling the yoke caused the nose of the aircraft to rise again and the aircraft to lift off from the runway. Because the aircraft was flying too slowly, the instructor immediately pushed the yoke, where after the aircraft touched the runway again. After this, the instructor performed the required actions to continue with a takeoff. The student was still holding the yoke and according to both their statements there was no communication between the instructor and student. This led to the situation that it was unclear who eventually piloted the aircraft at this point.

The lack of clear communication as well as the lack of clear instruction and hand-over by the instructor led to a situation where it was unclear how the tasks were divided in the cockpit.

Although full throttle was given during the touch-and-go, both pilots felt that the aircraft did not accelerate as expected. Contrary to their statements on the events during the takeoff, their recollections of what happened next differed. The instructor stated that he lowered the nose of the aircraft in order to get more speed, however, this is not visible in the footage (Figure 1). The student stated that he almost constantly heard the stall warning of the aircraft during the takeoff roll, although the instructor did not recall this. Activation of the stall warning is an indication that the airspeed of the aircraft is some knots above the stall speed and in that situation the aircraft is not in the right configuration for a safe takeoff. The activation of the stall warning was caused by the aircraft nose up position that was too high in relation to the speed.

The footage (Figure 1) shows that during the takeoff roll, the nose wheel of the aircraft was permanently detached from the ground and that the aircraft had a high nose attitude during the takeoff roll. This is an indication that, although the instructor stated that he pushed the yoke after the landing, the yoke was still pulled or pulled again.

The student stated that he was still holding the yoke and might have pulled it although the instructor did not feel this, nor did the instructor hear the stall warning. This may be explained by the fact that the instructor's attention was completely focused on a successful takeoff of the aircraft.

As soon as it became clear that the aircraft was not accelerating as desired, there was still room for the instructor to abort the takeoff, although it was possible that the aircraft would end up in the grass at the end of the runway. However, this required immediate action. This was not done and the attempt to takeoff was continued.

After calculating the time and distance travelled, it was found that the ground speed of the aircraft during the takeoff roll had been between 56 and 66 kts. Referring to the pilot's operating handbook, the stall speed of a PA-28 can only be determined in power off conditions, but considering the footage, the behavior of the aircraft and the statements of the instructor and student, it can be concluded that it was attempted to takeoff with a speed close to the stall speed. This was caused by back pressure on the yoke, keeping the aircraft's nose up.

Despite the signals that the aircraft was unable to takeoff normally, the instructor continued the takeoff. It was attempted to takeoff while the aircraft's speed was close to the stall speed.

2.3 Aerodynamics

Despite the fact that the instructor had selected full power, the aircraft did not accelerate during the touch-and-go. This can be explained by the aerodynamic properties. A moving aircraft has to overcome drag to be able to fly. The total drag consists of parasite drag and induced drag. Parasite drag is highest at high airspeeds, induced drag is highest at slow airspeeds and high angles of attack. To overcome the total drag of the aircraft to be able to fly, the power available must be higher than the total drag. The difference between the available power and the power required to fly, determines the climb or acceleration capability. At a certain point at low speed, the maximum available engine power is not enough to compensate the drag. If this happens during flight, an increase in power can easily lead to an increase in drag. This is called the 'back-side-of-the-power curve' or 'the region of reversed command'. This was the case during the takeoff roll: the drag as a result of the high angle of attack and the relative low airspeed could not or hardly be compensated by the engine power (see the black circle in Figure 4).

When full power is already selected, lowering the nose of the aircraft to decrease the angle of attack is the only way to increase speed.

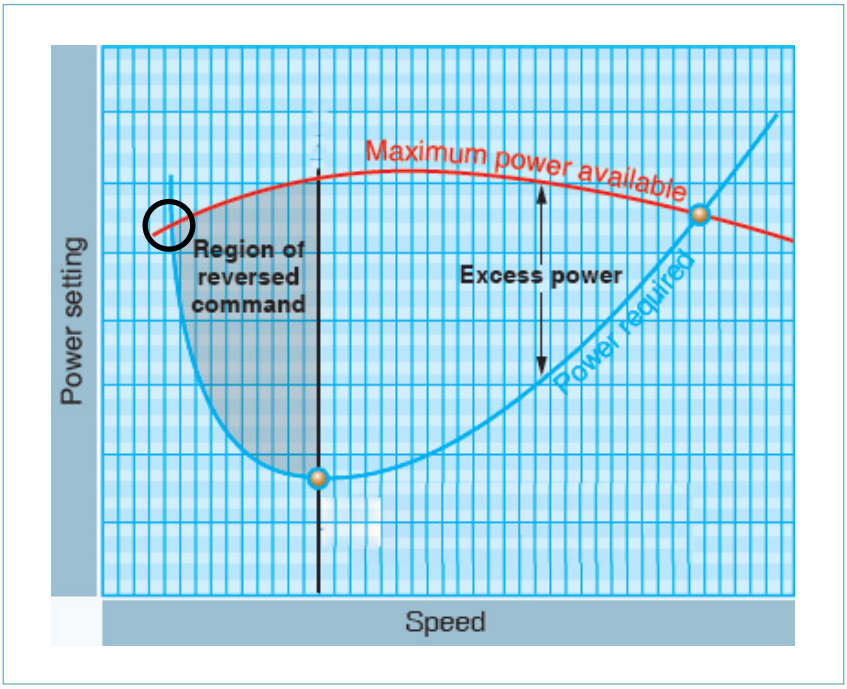

Figure 4: Power curve. (Source FAA, modified)

The drag as a result of the high angle of attack and the relative low airspeed could not or hardly be compensated by the engine power.

2.4 The accident

When the aircraft became airborne and flew a little above the runway, it banked to the left. This could have been the result of the student and passenger, with a combined weight of around 235 kg, both sitting on the left side of the aircraft. When an aircraft is banking, the stall speed increases. The banking of the aircraft resulted in the aircraft losing lift again and touching and rolling on the grass. The aircraft was heading toward some buildings. To avoid a collision, the instructor pulled up the nose of the aircraft and steered it to the right. Pulling up the nose in combination with a bank to the right caused the aircraft to stall and to fall over the right wing after which the aircraft crashed.

The accident with PH-LAG can be classified as a loss of control in-flight (LOC-I) accident. Loss of control can happen because the aircraft enters a flight regime that is outside its normal flight envelope and may quickly develop into a stall or spin. Loss of control in-flight is the most frequent and most deadly type of accident in general aviation. The take-off and landing phase are particularly risky.[4]

2.5 Weight and balance

The total takeoff mass of the aircraft was calculated 2,527 lbs. After recalculation these weights were found to be correct. The estimated landing mass of the aircraft was calculated to be 2,497.15 lbs with the center of gravity (CG) of 89.5 inches aft of the datum. Both the total mass and the CG were within the limits of the flight envelope, as stated in the pilot's operating handbook. The total mass was slightly under the maximum takeoff mass of 2,550 lbs. The limits of the CG are 82 and 93 inches aft of the datum.[5] The mass of the aircraft just below the maximum and the CG laying afterwards, had a negative effect on the flight characteristics of the aircraft. A high mass increases the stall speed and an aft CG has effect on longitudinal stability; it creates a pitch up moment. This had an effect on the occurrence of the accident.

The elevator trim tab was found in the down position, indicating that the elevator was trimmed *'nose up'*. The elevator trim control in the cockpit was found in slightly *'nose down'* position. It could not be determined if the elevator trim played a role in this accident.

The mass of the aircraft just below the maximum and the CG laying afterwards, had a negative effect on the flight characteristics of the aircraft.

4 EASA website, Domains, General Aviation, Flying safely, Loss of Control (LOC-I).
5 These limits of the mass and center of gravity apply when flown in the normal category.

3 CONCLUSIONS

The accident was the result of trying to takeoff during a touch-and-go, with a speed close to the stall speed. This was the result of a high angle of attack during the takeoff roll. As a result of the high angle of attack and the relative low airspeed, the drag could not or hardly be compensated by the engine power during the touch-and-go.

Despite the signals that the aircraft was unable to takeoff normally, the flight instructor continued the takeoff roll. When the aircraft became airborne at low altitude it did not gain altitude, banked and struck the ground with its right wing. The aircraft crashed just outside the aerodrome boundary.

The high nose attitude during the takeoff roll was caused by an aft held position of the yoke. The simultaneous steering inputs on the yoke of both the flight instructor and the student contributed to the nose's high attitude. The lack of clear communication and clear instructions led to a situation where it was unclear how the tasks in the cockpit were divided. Instruction by another instructor led to a way of instruction the student was not used to.

The weight and balance of the aircraft were within the limits. The mass of the aircraft just below the maximum and the CG laying afterwards, had a negative effect on the flight characteristics of the aircraft.

The technical examination of the aircraft did not reveal any malfunctions that could have contributed to the accident.

Following the accident, the flight school took measures to prevent instructors from instructing on aircraft types with which they have limited experience.

APPENDIX A

RESPONSES TO THE DRAFT REPORT

In accordance with the Dutch Safety Board Act, a draft version of this report was submitted to the parties involved for review. The following parties have been requested to check the report for any factual inaccuracies and ambiguities:

- European Union Aviation Safety Agency
- Flight instructor
- Flight school
- Human Environment and Transport Inspectorate
- Student pilot

The responses received, as well as the way in which they were processed, are set out in a table that can be found on the Dutch Safety Board's website (www.safetyboard.nl). The responses can be divided into the following categories:

- Corrections and factual inaccuracies, additional details and editorial comments that were taken over by the Dutch Safety Board (insofar as correct and relevant). The relevant passages were amended in the final report.
- Not adopted responses: the reason for this decision is explained in the table.

DUTCH
SAFETY BOARD

Visiting address
Lange Voorhout 9
2514 EA The Hague
The Netherlands
T +31 (0) 70 333 70 00

Postal address
PO Box 95404
2509 CK The Hague
The Netherlands

www.safetyboard.nl