

AA2009-1

**AIRCRAFT ACCIDENT  
INVESTIGATION REPORT**

**PRIVATELY OPERATED**

**J A 2 5 6 9**

**January 23, 2009**

**Japan Transport Safety Board**

The investigation for this report was conducted by Japan Transport Safety Board, JTSB, about the aircraft accident of Private owned Grob G109 registration JA2569 in accordance with Japan Transport Safety Board Establishment Law and Annex 13 to the Convention on International Civil Aviation for the purpose of determining causes of the aircraft accident and contributing to the prevention of accidents/incidents and not for the purpose of blaming responsibility of the accident.

This English version of this report has been published and translated by JTSB to make its reading easier for English speaking people who are not familiar with Japanese. Although efforts are made to translate as accurately as possible, only the Japanese version is authentic. If there is any difference in the meaning of the texts between the Japanese and English versions, the text in the Japanese version prevails.

Norihiro Goto,  
Chairman,  
Japan Transport Safety Board

# **AIRCRAFT ACCIDENT INVESTIGATION REPORT**

**PRIVATELY OPERATED**

**GROB G109B (MOTOR GLIDER: TWO SEATER)**

**JA2569**

**AT AROUND 14:59 JST, MAY 2, 2008**

**HIDA TEMPORARY OPERATION SITE (HIDA AIRPARK)**

**NYUKAWA TOWN TAKAYAMA CITY, GIFU PREFECTURE**

December 10, 2008

Adopted by the Japan Transport Safety Board  
(Aircraft Sub-committee)

Chairman	Norihiro Goto
Member	Yukio Kusuki
Member	Shinsuke Endo
Member	Noboru Toyooka
Member	Yuki Shuto
Member	Akiko Matsuo

# 1 PROCESS AND PROGRESS OF AIRCRAFT ACCIDENT INVESTIGATION

## 1.1 Summary of the Accident

On May 2 (Friday), 2008, a privately-owned Grob G109B, JA2569, took off from the Hida Temporary Operation Site and flew around the site for pleasure. When it was to land, it bounded, failed to take off again in its attempt to make a go-around, deviated from the site, crashed into trees in the woods to the east of the runway, and stopped there around 14:59 Japanese Standard Time (JST).

The occupants of the glider, both the captain and the passenger, received minor injuries. The aircraft was destroyed completely but did not catch on fire.

## 1.2 Outline of the Aircraft Accident Investigation

### 1.2.1 Investigative Organization

On May 2, 2008, the Aircraft and Railway Accidents Investigation Commission assigned an investigator-in-charge and one other investigator to this accident.

### 1.2.2 Accredited Representative Participating in the Investigation

An accredited representative of Germany, the state of design and manufacture of the aircraft involved in this accident, participated in the investigation.

### 1.2.3 Implementation of Investigation

May 3, 2008	Investigation at the site and interviews
May 7, 2008	Interviews
May 12 to 16, 2008	Interviews

### 1.2.4 Comments from Parties Relevant to the courses of the accident

Comments were taken from the parties relevant to the cause of the accident.

### 1.2.5 Comment from the Participating State

Comments were invited from the state participating in the investigation.

## 2. FACTUAL INFORMATION

### 2.1 History of the Flight

On May 2, 2008, a privately owned Grobe G109B, JA2569 (hereafter called “the Aircraft”), took off from Hida Temporary Operation Site (hereafter called “Hida Site”) for pleasure at 13:07, with the captain sitting in the right pilot seat and a passenger sitting in the left pilot seat.

The flight plan was to fly within a radius of nine kilometers, with Hida Site as the center.

The history of the flight up to the accident is as outlined below, based on the statements of the captain, the passenger, and witnesses who were at Hida Site.

#### (1) The captain

That day, I prepared the Aircraft for flight from about 11:00 at Hida Site. After lunch, we got a request for an experience flight, for which the passenger wished to take the left pilot seat, so I sat in the right pilot seat, and we took off at about 13:07. After we flew around for about one and a half hours, I tried to make a landing approach to Runway 10 of Hida Site.

On the first approach, the altitude was too high, so I made a go-around short of the approach end of Runway 10. The Aircraft touched down on its second try, but it bounded, so I immediately made a go-around. Then, we held in the south of Hida Site because a tug airplane took off and a glider landed at the site.

I could not keep the approach angle well, because it was awkward for me to handle the air brake<sup>1</sup> with my right hand in the right pilot seat, so I drank some water to calm down while holding and making turns.

At the time of the accident, I made the landing approach at 115 km/h as specified in the Flight Manual, and told the passenger, “This is the approach speed.” I approached by deciding on a touchdown point between 150 and 200 meters from the approach end of the runway. I think that as the altitude became somewhat low, I changed my hands over and opened the throttle slightly. Then, the altitude became too high but I couldn’t lower it, which caused the touchdown point to extend about 100 meters further than I had decided.

During the approach descent, I found it difficult to operate the air brake with my right hand, and was preoccupied with operating it, retracting a little too much at one time or extending too much at another. I felt that the approach angle became a bit too shallow, so I tried to sink by extending the air brake a little, but then the ground came close, and the Aircraft touched down at high speed and bounded. I thought that it was no good, and then the Aircraft bounded again on the second touchdown and then again on its third attempt.

As we could see the runway center marking in front of us, and a glider at the end of Runway 10, I decided to make a go-around, thinking that at this rate the Aircraft would shoot off the runway and lead us into a dangerous situation.

First, I closed the air brake with my right hand, and then I changed my hands over and opened the throttle with my left hand. I turned the nose of the Aircraft to the right in the air, in order to avoid the glider on Runway 10. At that time, the air brake lifted upward as if it made a big noise, and I could catch the blue air brake lever moving with my right eye, and the airframe sank significantly. So, I changed my hands over and closed the air brake with my right hand, then

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<sup>1</sup> Air brake is a name given in the Aircraft’s manual, and a synonym of “dive brake”. Similarly to “the spoiler”, it is used for adjusting the rate of descent at landing approach.

I changed my hands over again, and I intended to confirm the throttle position. I don't remember clearly if I had fully opened the throttle.

Then, because the Aircraft flew to the far right, I banked it left. There were vinyl houses on both sides in front, farther beyond which was woods, so I intended to climb through in between the vinyl houses where the trees were low, but instead of climbing, the Aircraft crashed into the trees and stopped. The engine had stopped at that time. I turned off the ignition and master switch, and closed the fuel cock, and both of us escaped the Aircraft from the right-side door ourselves.

While making go-arounds, I thought that the Aircraft was not touching the ground. Furthermore, I was not aware that the Aircraft collided with the fence; I was doing my best to climb somehow, as the trees were coming close in front of our eyes.

I couldn't delicately control the air brake for landing with my right hand, in the right pilot seat, which made me feel uneasy with the operation, and I failed in landing.

I had performed a landing in the right seat once in Sekiyado, and about 10 times at Nagoya Airfield, but I had never tried it at Hida Site before.

I had been flying at Nagoya Airfield (Runway 2,740 m × 45 m) until March, so when I came to Hida Site, the runway (800 m × 25 m) seemed very short and narrow. I got on board the Aircraft in the right seat the previous day for a dual flight, but I didn't take the controls.

I had been flying gliders by tug airplane at Hida Site for the last 10 years or so. From the beginning, whenever we fly a glider with a tug airplane, another glider has been held on the overrun of Runway 10. So I understood that there was another glider on the overrun of Runway 10; I saw another glider placed on the overrun when I made the first and second go-arounds.

There was no abnormality with the engine during the ground run-up or in the air, and I think it was normal when I opened the throttle at the time of the accident. Also, I set the propeller pitch<sup>2</sup> to CLIMB position before the first landing and I didn't operate it after that.

I made contact with the ground before landing and they reported that the wind was calm. The sock seen from high air was slightly tilted, so I thought there was almost a headwind. There was no air current disturbance at the landing approach.

## (2) Passenger

I had an experience flight at Hida Site around last summer for the first time, and then I tried another experience flight, taking the left seat with the captain controlling the glider, in February this year at Nagoya Airfield.

The day before the accident occurred, I got on board the Aircraft controlled by another pilot, requesting to take the left seat, as I wanted to watch the indications of the instruments during flight. Also, on the day of the accident, I requested the captain to allow me to ride in the left seat.

After takeoff, we flew around, and then we made a go-around for the first and second landing approach, and had an accident on our third landing attempt. On that third attempt, we felt a strong impact, as the Aircraft bounded and jumped two or three times. Then, trees jumped into my sight.

After the accident, I couldn't move because of pain in my back, but I got out of the Aircraft with help from the captain.

## (3) Witness A (in charge of communication at the piste)

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<sup>2</sup> There are three propeller pitch positions for the aircraft; Climb, Cruise, and Feather.

I had been at the apron in charge of communications with aircraft that take off and land for about 10 minutes before the accident occurred.

I don't remember how the Aircraft made its first approach. At the second approach, it made a go-around after its touchdown. Then, the Aircraft was holding in the south of Hida Site because a glider took off with a tug airplane and another glider landed.

At the time of the accident, the Aircraft bounded after touchdown. The bound was high, but I didn't get the impression that it would result in an accident. Then, it bounded again, but I don't remember how many bounds it made. Meanwhile, the sound of the engine grew, and after that, I got the feeling that the engine grew louder and then quieter.

The Aircraft ran toward the right hand of the runway on the grass area, heading toward the piste, then banked to the left and ran in parallel with the runway at a certain speed, and finally it went out of sight.

When the Aircraft landed, the wind was calm — at about 1m/s — and it was not a tailwind.

There was another glider waiting on the overrun of Runway 10 for its turn to fly next with a tug airplane.

I confirmed the time of accident occurrence at 14:59, and wrote it down in the communication record.

(4) Witness B who was at the end of Runway 10

Our glider was parked on the center line of the overrun of Runway 10, and I was waiting to fly with a tug airplane. There were about four or five people around the glider, and I was on the center line watching the Aircraft landing.

The Aircraft touched down almost on the runway centerline, but it bounded as if it were drop-landed, and moved to the south of the runway after landing. I thought it would stop there, but then the sound of the engine grew louder. Then I felt that the engine became quieter and then louder again. The Aircraft, which I had thought would stop, kept running out of the south side of the runway, so I ran away to the north of the runway because I felt it was dangerous to stay.

The Aircraft went out of Hida Site, and the engine sound stopped.

This accident occurred in mountain forest about five meters lower than the runway surface, approximately 140 meters east of the end of Runway 10 at Hida Site (latitude 36° 10' 44"north, and longitude 137° 19' 09"east, ground elevation at 714 m), at about 14:59. (See Figures 1, 2, and Photos 1 and 2.)

## **2.2 The Dead, Missing and Injured**

The captain and the passenger received minor injuries.

## **2.3 Information on the Damage to Aircraft**

### **2.3.1 Extent of Damage**

The Aircraft was completely destroyed.

### **2.3.2 Damaged Condition of the Aircraft Parts**

- |                    |                                 |
|--------------------|---------------------------------|
| (1) Body fuselage: | Tail section was bent           |
| (2) Main wing:     | Left wingtip received scratches |

Right wing was torn off

- (3) Cockpit front wind shield: Damaged
- (4) Propeller blades: Both were torn off at half length.
- (5) Gear: Left main gear: Broken and torn off  
Right main gear: Damaged (cut into the airframe)  
Neither had flat tires.
- (6) Engine: Not damaged

## 2.4 Positions of Airbrake Control Levers, etc.

The airbrake control levers are placed on the window sides of both the left and the right pilot seats, and a pilot controls the lever with his left hand when sitting in the left seat, and with his right hand when sitting in the right seat.

The throttle is placed in between the left and right seats, so it is impossible for a pilot to control the throttle and the air brake at the same time, because he holds the control column with one hand.

The airbrake control lever is locked when pushed forward into detent position. However, when released, it cannot be locked in the mid position, so a pilot must hold the lever with his hand.

Just after the accident, the airbrake control lever of the Aircraft was in the unlocked position, pulled approximately 3 to 5 cm in the opening direction. It is the condition in which the air brake rose up slightly (opened) on the wing surface.

Twigs had caught between the air brake and the wing upper surface of the left main wing.

During investigation, the twigs were removed to enable operation of the air brake, and it was found that the control lever and the air brake could be operated normally; they could be locked normally, too.

(See Photo 3.)

## 2.5 Damage to Objects Other Than Aircraft

The wire netting fence on the border of Hida Site was damaged, and a tree at the place where the Aircraft stopped was broken.

## 2.6 Pilot Information

Captain	Male, Age 68 years	
Private pilot certificate		September 26, 1977
Type rating	Soarer	September 26, 1977
	Motor glider	October 31, 1994
Flight instructor rating (glider)		June 21, 1995
2 <sup>nd</sup> class aviation medical certificate		
Validity		April 30, 2009
Total flight time		713 hrs and 33 min
Flight time in the last 30 days		2 hrs and 57 min
Flight time in the aircraft type		38 hrs and 43 min
Flight time in the last 30 days		1 h and 45 min



## **2.7 Aircraft Information**

### **2.7.1 Aircraft**

Type	Grob G109B
Aircraft serial number	6255
Date of manufacture	March 20, 1984
Certificate of airworthiness	07-11-21
Total time in service	605 hrs and 14 min
Time in service since last regular inspection (50-hour inspection, on November 30, 2007)	31 hrs and 44 min

(See Figure 3.)

### **2.7.2 Engine**

Type	Grob 2500E1
Part number	058
Date of manufacture	March 3, 1984
Total time in service	527 hrs and 37 min
Time in service since last regular inspection (500-hour inspection, on November 30, 2007)	31 hrs and 44 min

### **2.7.3 Weight and Balance**

It is estimated that the weight and center of gravity of the Aircraft at the time of the accident were 807 kg and 35.6 cm aft of the datum point respectively, and both of which are estimated to have been within the permissible limits (850 kg for the maximum landing weight and 23.0 ~ 36.3 cm within the allowable range for the center of gravity).

### **2.7.4 Fuel and Lubricating Oil**

The fuel was high-octane gasoline<sup>3</sup> for automobiles, and the lubricating oil was pro-stage 20W-50.

## **2.8 Meteorological Information**

On the basis of a statement of a witness who was at Hida Site, there was almost no wind, and it was little misty, but the visibility was not bad as they could see mountains in the distance. The clouds spread thinly from the mid to the upper layers, and there was little cloud cover over the top of high mountains.

## **2.9 Information on the Accident Site and the Wreckage**

### **2.9.1 Hida Site**

Hida Site was constructed as a temporary operation site for agricultural use. Surrounded by high mountains, the ground elevation of Hida Site is 714m. The runway heading is 10/28, with a downward inclination of 1.4 degrees to the west. The runway is 800m long and 25m wide. It has markings equivalent to those of H-class runways, and there are 5.5m-wide paved shoulders on both sides of the runway and 60m-long paved overruns on both ends of the runway.

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<sup>3</sup> The flight manual specifies the fuel to be used as the aircraft or automobile gasoline (96 octane or higher).

### **2.9.2 Conditions at the Accident Site**

On the shoulder south of the runway, 287 meters east of the runway halfway marker, there was a fine linear trace of a graze. Then there was a tire trace on the grass area just next to the place where the trace of a graze ended, and the tire trace disappeared for a while and then two tire traces appeared. There were no traces of grazes on the shoulder between these two points. After that fine linear traces of a graze appeared again on the shoulder of the overrun, 15 meters east of the location where the traces of the tires ended, and continued until the east end of the overrun. The traces of the tires were light, not ones made under heavy weight.

The border fence east of the site was damaged at one place, and two collision traces were found on the slope of a gutter, which was 14.5m east from the fence in the heading direction. The interval between the collision traces roughly corresponded to the width of the two main wheels of the Aircraft. A piece of the tip of the propeller blade was found 15 meters on the right (south) of the collision trace.

The Aircraft stopped at 30 meters east of the border fence of Hida Site, in woods downward of the levee, where the ground level is 5m lower than the runway surface.

The Aircraft stopped with its heading at 180 degrees, the tail section was bent, and the left main wheel was separated and had fallen to the left of the airframe. Also, a tree in front of the right main wing was bent, and another tree which was diagonally in front of the damaged right main wing, had scratches.

(See Figures 1 and 2, and Photos 1, 2, and 4.)

### **2.9.3 Conditions of the Airframe and Seats, etc.**

The front windshield of the cockpit of the Aircraft was broken, and the left pilot seat was partially damaged.

According to the statement of the captain, he and the passenger fastened the shoulder harnesses and the seat belts; however, they unfastened them themselves when they escaped from the Aircraft.

## **2.10 Medical Information**

According to the result of the doctor's examination after the accident, the captain suffered a contusion in his back and the passenger had received a minor strike on the left buttock.

## **2.11 Air Brake**

Once unlocked, the airbrake control lever of the Aircraft has to be held by a hand during the operation, because it is configured in such a way that it cannot be locked in a mid position. According to the statement of the captain, when operating the air brake while airborne, if the air brake is extended a little, a strong force on the airbrake control lever could be exerted toward the direction of extension due to wind pressure, so the lever must be held firmly by hand.

The force applied in the opening direction depends on the opening degree, velocity, attitude, and so on.

## **2.12 Captain's Operating Experience with Motor Gliders**

The captain's operating experience with motor gliders, based on the statement, log

journal and the flight record of the Aircraft, is outlined below.

Since acquiring a motor glider license in 1994, the captain had flown motor gliders for about 34 hours before he operated the Aircraft. He flew mainly model type Scheibe SF-28A Tandem Falke. Furthermore, he flew a side-by-side type only two times 11 years ago, but he had never operated in the right pilot seat.

The captain started to train for the Aircraft in Sekiyado in August 2007, about 10 months before this accident, and then ferried the Aircraft to Hida Site with his instructor.

He had trained for the Aircraft at Hida Site and did a “solo flight”<sup>4</sup> in October, 2007. He flew 15 times in November that year, 13 times of which he flew with a club member for their training, four times of which he sat in the right seat, but he had never performed landing in the right seat.

Thereafter, the Aircraft was ferried to Nagoya Airfield. At Nagoya Airfield the captain flew the Aircraft 21 times from January to March 2008, 16 times of which he took the right seat. During those 16 flights during which he took the right seat, he performed landing in the right seat about 10 times.

The Aircraft was ferried to Hida Site by another pilot on April 29, and on May 1, the day before this accident, the captain got on board the Aircraft and took the right seat for training of his flight companion, but did not take the controls.

The captain had sat in the right seat of the Aircraft many times, but had very limited experience in executing landings in the right seat, because the pilot who sat in the left seat had a license for flying gliders. Moreover, the captain had never trained landing in the right pilot seat at Hida Site.

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<sup>4</sup> According to the Hida Glider Operation Manual compiled by Hida Site, solo flights are allowed only for pilots certified to fly as captain in the Hida region.

### 3 ANALYSIS

**3.1** The captain possessed adequate airman pilot license and a valid aviation medical certificate.

**3.2** The Aircraft had a valid airworthiness certificate and had been maintained and inspected in accordance with applicable regulations.

**3.3** It is estimated that the weather prevailing at the time of this accident bore no relation to the accident.

#### **3.4 Analysis of Passage to the Aircraft Accident**

As described in 2.1 (1), it is estimated that the Aircraft entered into a porpoise<sup>5</sup> condition, touched down at high speed and bounded, because the captain didn't flare the Aircraft sufficiently.

The captain made a go-around immediately after the Aircraft bounded for the landing prior to the accident, but at the time of this accident, he repeated bounds before making a go-around. Due to the fact that he didn't make a go-around after repeated bounds, it is considered possible that he grew anxious about the airbrake operation due to repeated failures, so he aimed to stop the Aircraft right away.

Furthermore, it is considered that the following aspects might have factored in the go-around that the captain was not able to make properly.

(1) After the engine power was increased, the Aircraft rose up, but the speed was not fast enough.

(2) The air brake was in the open position.

(Based on the air brake was not locked, and twigs were caught between the air brake and the surface on the wing, it is estimated that the Aircraft plunged into the woods with its air brake in the open position.)

(3) The Aircraft banked to the left.

(Based on the traces of grazes on the shoulder south of the runway and on the left main wingtip, it is estimated that the Aircraft banked to the right and deviated from the runway, and then banked to the left, causing its left wingtip to touch the runway shoulder.)

(4) The engine output was increased for go-around but was once lowered.

(Based on the witness's statement that the sound changed and the captain released his hand from the throttle lever to operate the air brake, it is estimated that the engine output was changed.)

The Aircraft, running and/or rising up slightly above the ground, hit the fence, and then dropped in the gutter ahead. As described in 2.1 (4), because the engine sound faded out outside of Hida Site, and from the place where the edge of a propeller blade was dropped as described in 2.9.2, it is estimated that the propeller blade was torn off when the Aircraft dropped in the gutter, at which time the engine was stopped.

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<sup>5</sup> Porpoise landing refers to a state in which an aircraft, after drop-landing and bounding, continues repeatedly moving in a combination of drop-landing and pitching motions.

### **3.5 Landing Operations with the Captain's Right Seat**

As described in 2.1 (1) and 2.12, although the captain had performed landings in the right seat of the Aircraft at Nagoya Airfield, he had never performed them before at Hida Site where the runway is short.

The captain had felt uneasy about operating the air brake with his right hand; therefore he should have let a licensed person on board in the left seat and trained in landing operations in the right seat sufficiently at Hida Site. Moreover, when he let a person with no piloting experience on board, and if he felt even slightly anxious about operations, he should have sat in the left seat, even when the passenger wished to sit there. Therefore, it is considered that he should cope by taking careful measures for safety.

### **3.6 Go-Around**

Although the captain made a go-around immediately after the Aircraft bounded at landing prior to this accident, he repeated bounds at the time of the accident.

At touchdown, bounds could phase out and eventually stop, but there are times when bounds grow bigger and result in accidents, so he should have made another go-around immediately after the Aircraft bounded.

There are approximately 400m from the runway halfway point to the end of Runway 10, so it is estimated that the captain could have made a go-around safely if he had locked the air brake firmly, and taxied straight to gain take off speed, after setting takeoff output.

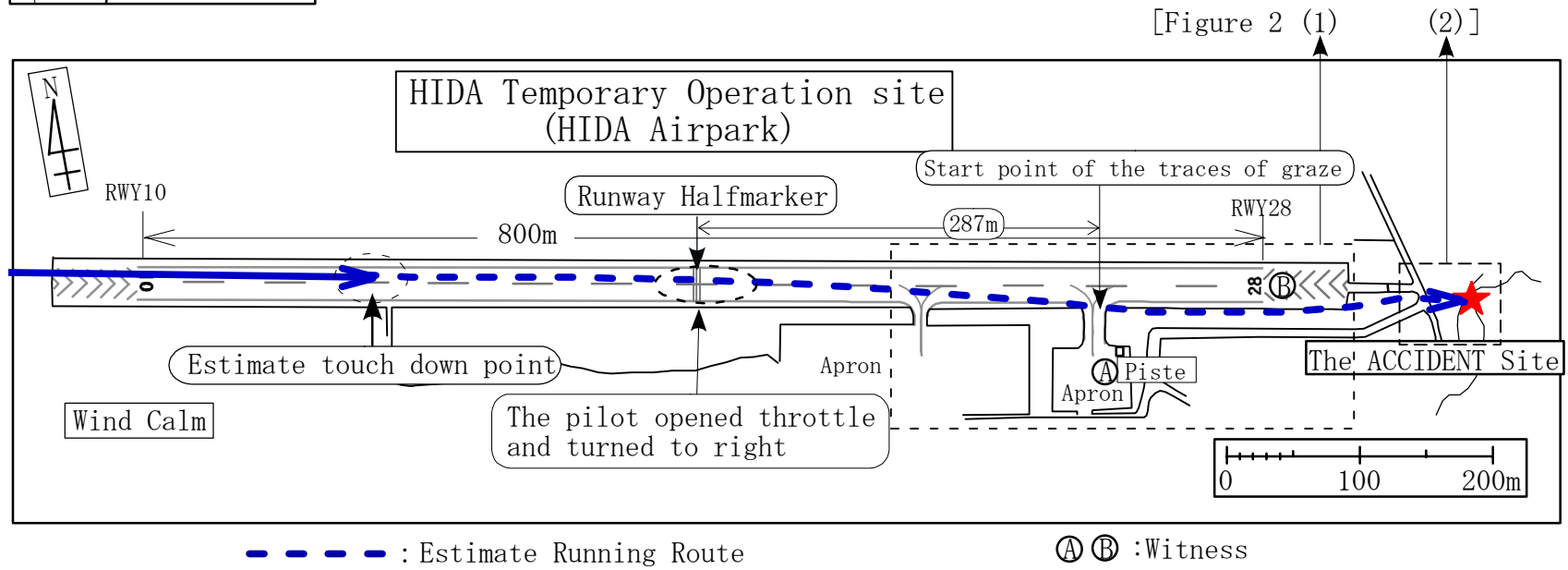
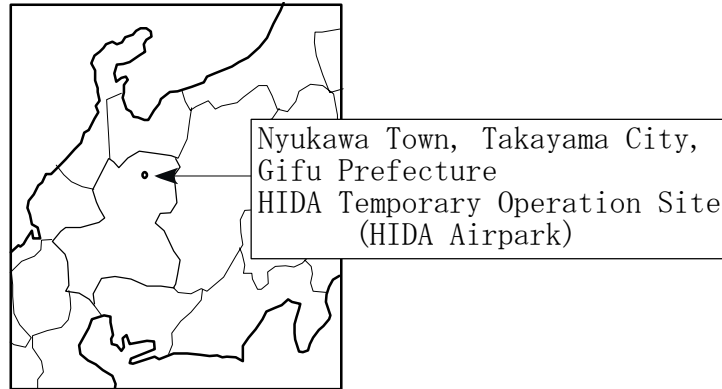
## **4 PROBABLE CAUSE**

It is estimated that this accident occurred because the captain attempted a go-around after the Aircraft repeated bounces at landing, and as he failed to take off again, as a result the Aircraft crashed into trees and was destroyed completely.

As for the fact that the Aircraft bounced at landing, it is estimated that this was caused by the captain's inability to operate the air brake properly, as he was sitting in the right seat. Also, the cause of the Aircraft failing to take-off again is estimated to be the captain's inability to properly perform a go-around.

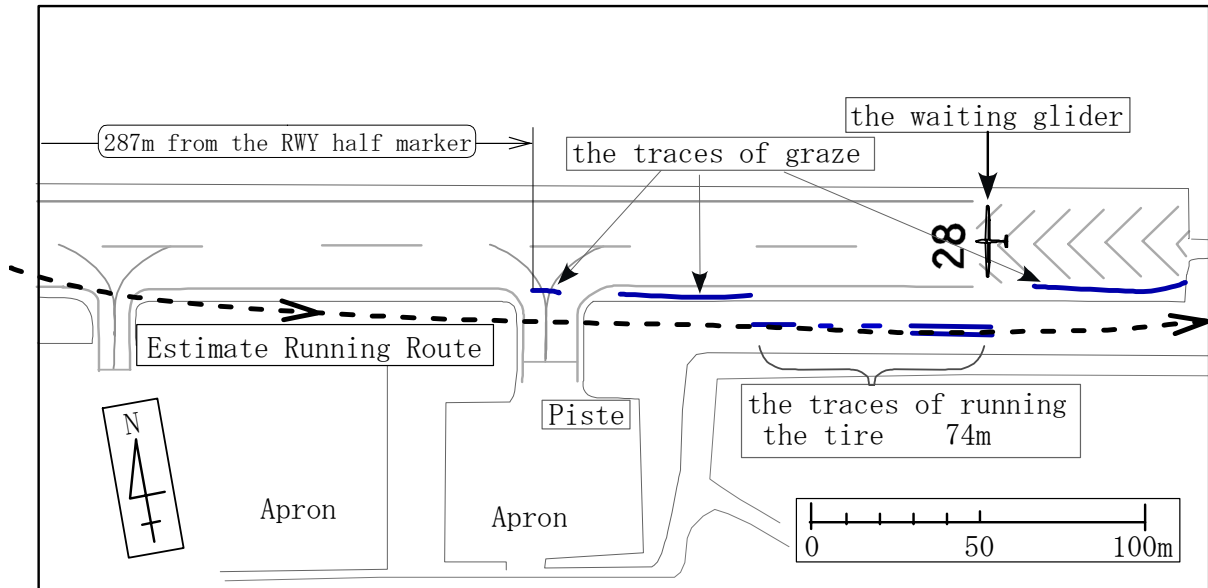
# Figure1 Estimate Flight Route

(Estimate Running Route)



## Figure 2 The Accident Site

(1) The traces on the shoulder of the RWY south side and grass area



(2) The Accident Site

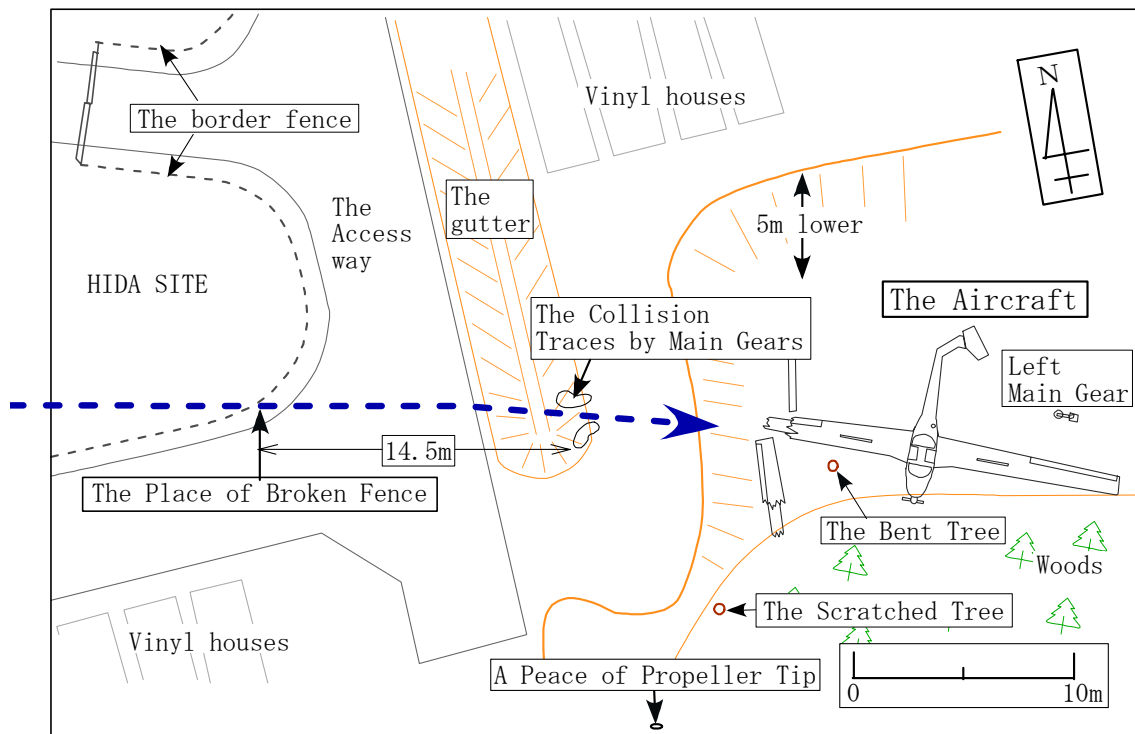




Figure 3 Three views of GROB G109B

unit : m

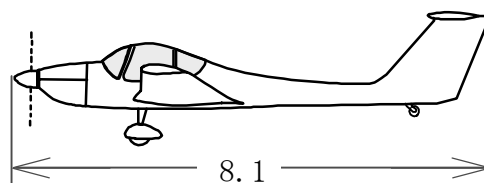
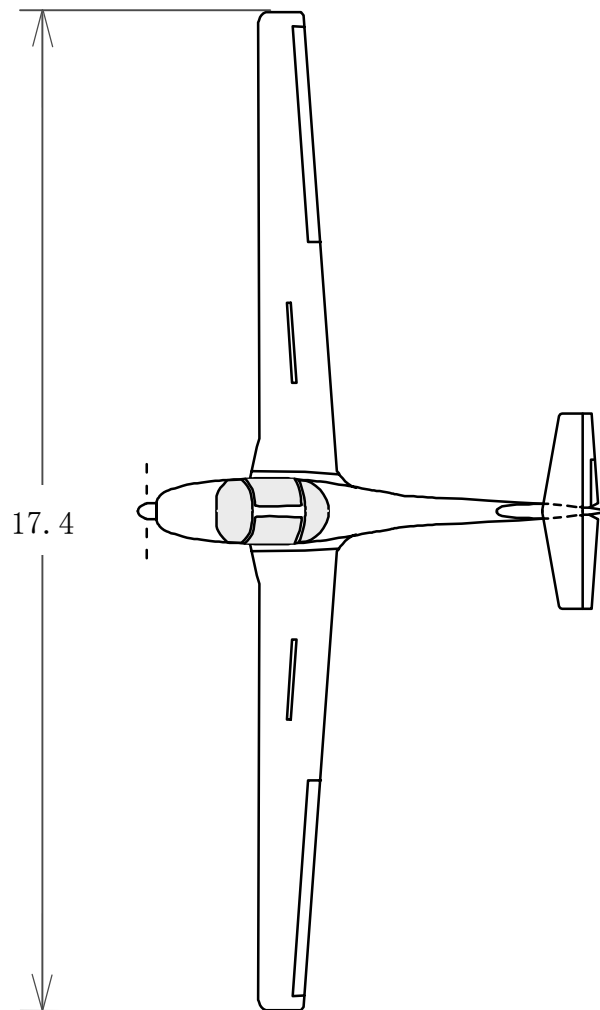
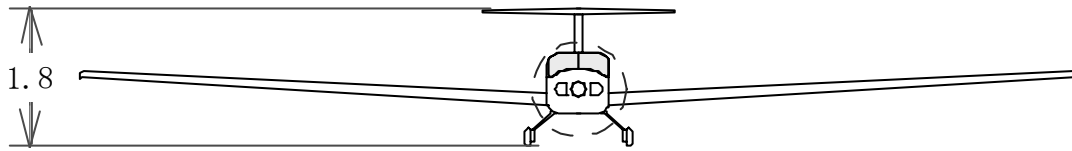
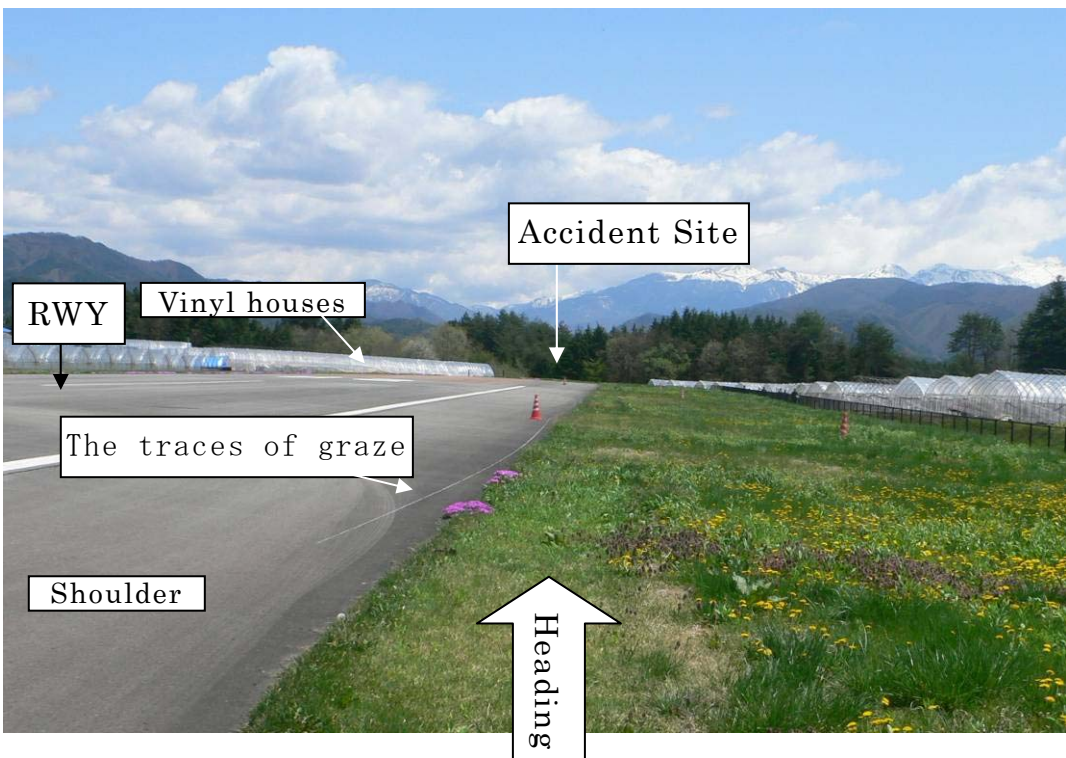


Photo 1 Accident Aircraft



Photo 2 RWY South-side Shoulder



### Photo 3 Airbrake

The Airbrake caught twigs



Airbrake Control Lever (Unlock Position)



### Photo 4 Nose Section (Torn Propeller blade)

