

AA2016-1

**AIRCRAFT ACCIDENT  
INVESTIGATION REPORT**

**PRIVATELY OWNED  
J A 2 4 0 6**

**February 25, 2016**



The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board and with Annex 13 to the Convention on International Civil Aviation is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

Norihiro Goto  
Chairman,  
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

# AIRCRAFT ACCIDENT INVESTIGATION REPORT

**DAMAGE DURING LANDING  
PRIVATELY OWNED, HOFFMANN H-36 DIMONA  
(MOTOR GLIDER, TWO-SEATER), JA2406  
AT FUKUSHIMA SKY PARK,  
FUKUSHIMA CITY, FUKUSHIMA PREFECTURE,  
AT AROUND 11:54 JST, MAY 17, 2015**

February 12, 2016

Adopted by the Japan Transport Safety Board

Chairman	Norihiro Goto
Member	Shinsuke Endoh
Member	Toshiyuki Ishikawa
Member	Sadao Tamura
Member	Yuki Shuto
Member	Keiji Tanaka

## 1 PROCESS AND PROGRESS OF THE INVESTIGATION

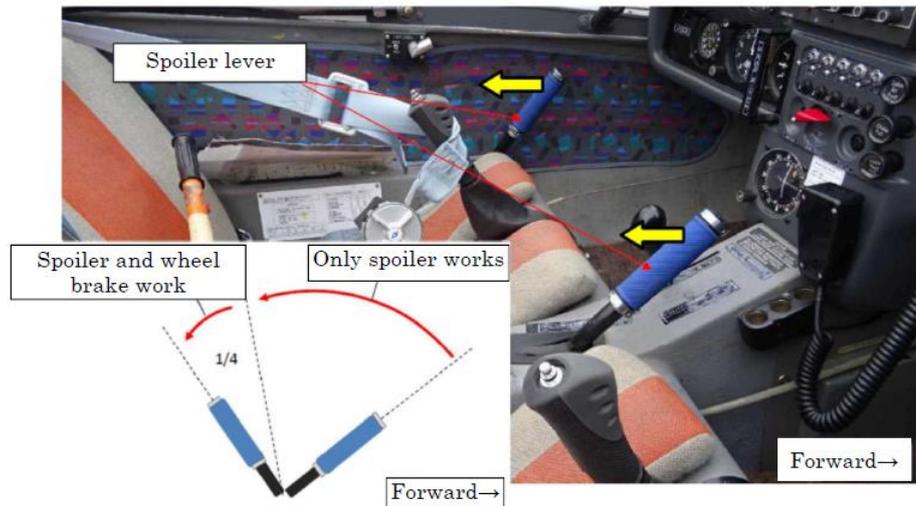
<p>On May 17, 2015, The Japan Transport Safety Board (JTSB) designated an investigator-in-charge and another investigator to investigate this accident. Although the Republic of Austria, as the State of design and manufacture of the aircraft involved in this accident, was notified of this accident, it did not designate an accredited representative. Comments were invited from parties relevant to the cause of the accident and the relevant State.</p>
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## 2 FACTUAL INFORMATION

<b>2.1 History of the Flight</b>	<p>According to the statements of the captain, the trainee and the witness, the history of the flight is summarized as follows.</p> <p>On Sunday, May 17, 2015 at around 10:14 Japan Standard Time (JST, UTC+9 hrs), a privately owned Hoffmann H-36 Dimona, registered JA2406 controlled by the trainee, took off from Runway 32 of Fukushima Sky Park for training flight with the trainee on the left seat and the captain who is an instructor on the right seat. After the air-works were finished, the Aircraft landed on Runway 32 at around 11:54 with meteorological information of Fukushima Sky Park from Fukushima Flight Service.</p>
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	<p>Flight instructor certificate (Glider) February 1,1979</p> <p>Class 2 aviation medical certificate Validity: March 31, 2016</p> <p>Specific pilot competence review</p> <p>Expiration date of piloting capable period November 3, 2015</p> <p>Total flight time 813 hours 39 minutes</p> <p>Flight time for the last 30 days 3 hours 00 minutes</p> <p>Total flight time on the type of aircraft 108 hours 16 minutes</p> <p>Flight time for the last 30 days 3 hours 00 minutes</p> <p>Trainee Male, Age 68</p> <p>Private pilot certificate (High class glider) October 4, 1991</p> <p>Class 2 aviation medical certificate Validity: July 7, 2015</p> <p>Specific pilot competence review</p> <p>Expiration date of piloting capable period September 21, 2015</p> <p>Total flight time 240 hours 13 minutes</p> <p>Flight time for the last 30 days 5 hours 11 minutes</p> <p>Total flight time on the type of aircraft 34 hours 40 minutes</p> <p>Flight time for the last 30 days 0 hours 00 minutes</p>
<b>2.5 Aircraft Information</b>	<p>Type: Hoffmann H-36 Dimona</p> <p>Serial number: 36251, Date of manufacture: August 26, 1987</p> <p>Certificate of Airworthiness No. 2015-39-02, Validity date: May 18, 2016</p> <p>Category of airworthiness Motor Glider Utility (U)</p> <p>Total flight time 1,519 hours 07 minutes</p>
<b>2.6 Meteorological Information</b>	<p>(1) Meteorological observations in Fukushima Sky Park around the time related to the accident were as follows:</p> <p>11:00 Wind direction 270° Wind velocity 10kt Maximum wind velocity 30kt Temperature 20.6°C Altimeter setting (QNH) 29.80inHg</p> <p>12:00 Wind direction 330° Wind velocity 8kt Maximum wind velocity 21kt Temperature 22.5°C Altimeter setting (QNH) 29.79inHg</p> <p>(2) According to the statements of the captain, the trainee and the witness, the weather was fine with good visibility in Fukushima Sky Park when the accident occurred. According to the report of Fukushima Flight Service at 11:45, the wind direction was 260°, the wind velocity was 10kt, and the maximum wind velocity was 18kt. The strong crosswind blew from the left side, and the wind direction of Runway 32 side was not stable in the approach. Although the wind direction and the wind velocity have been varied, the wind became temporarily stable as headwind before and after touch down.</p>
<b>2.7 Additional Information</b>	<p>(1) Wheel brake</p> <p>The wheel brake of the Aircraft is combined with the spoiler lever, the spoiler is extended by pulling the lever toward the pilot, and the wheel brakes of both sides start to be equally applied at the last quarter. If the spoiler lever is fully pulled to the end, the spoiler is fully extended and the wheel brake is fully applied.</p>



## (2) Flight manual

Flight manual of the Aircraft are described on landing as follows:  
(excerpts)

### 4-12 Landing by using engine

*Before landing, the spoiler must not be kept fully pulled position. If it is fully pulled position, the aircraft is made landing with the brake of main wheels locked. (Control of touch down), the pilot controls to raise the aircraft up to the normal horizontal position and keeps the direction with the rudder. After landing, the pilot shall pull the spoiler lever and apply the wheel brake if necessary.*

## (3) Control of Landing for tail wheel aircraft

In "Airplane operation textbook" (Japan Civil Aviation Promotion Foundation, March 31, 2009, the third edition, p.103), the landing roll guideline for tail-wheel aircraft is described as follows:  
(excerpts)

*If the main landing gear touched down to the runway, the throttle is fully closed. (omitted) the pilot maintains the aircraft attitude until deceleration. According to the deceleration of the aircraft, the lift force of the main wing is gradually reduced, which moves the loads of the aircraft to the main landing gear.*

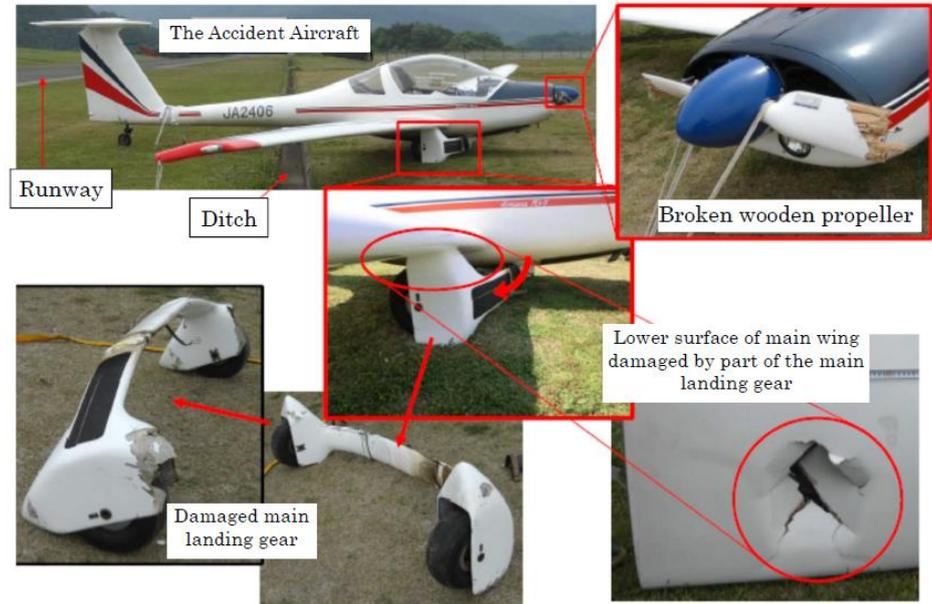
*The pilot makes the tail wheel gently touches down on the ground by flying controls during the period when the effect of elevators is left, so as not to dump the tail wheel on the runway. When three wheels touched down on the ground, the speed of the aircraft is quite rapidly reduced. From this stage, the pilot decelerates the aircraft to the speed of taxiing on the ground while controlling the direction by using the rudder and brakes. In deceleration, the particular attention must be paid to the use of brake so as not to cause ground loop\*1.*

## (4) Situation of fuselage

The shape of the main landing gear of the Aircraft is a reverse U-

\*1 "Ground loop" means that an aircraft is rotated to the left or the right on the ground when it takes off, makes a landing or taxiing. Especially, this phenomenon tends to occur by type of tail wheel aircrafts.

shaped type, and its both ends are equipped main wheels covered with aerodynamical fairing. In the installation of the main landing gear, the part adjacent to the body is held with two short metal belts in the left and right, and the front and back of each belt are fixed on the body with one bolt for each part.



Regarding the Aircraft damage, the bolts of the front of the right and left belts mounting the main landing gear were ruptured and the main landing gear was rotated about 90° to the rearward. When the main landing gear was rotated to the rearward, the rear part of the fairing of the main wheel stuck into the lower surface of the main wing, perforating the lower surface of both main wings about the range of 20 cm in diameter. The mark hit by propeller was left on the ground below the engine of the Aircraft, and two wooden propeller blades were broken. The contact marks of the left and right main wheels of the Aircraft which ran out of the runway while deflecting to the right, went on the runway and grass area, and there were intermittent contact marks of the tail wheel in the left side of the contact mark of the left main wheel.

The captain and the trainee stated that there were no malfunctions on the Aircraft including the engine and no one side effect of brake until just before the accident. In the investigation after the accident, it was found that there was no obstacles in control system and no leakage of brake oil. There were no difference between the left and the right working of the brake and tire pressure was also appropriate.

(5) Experiences of trainee

The trainee stated that he had previously watched a glider which landed under crosswind from the left like this time fall into ground loop and rotate in the left direction due to the weathercock effect.

In this accident, the trainee stated that he remembered the situation he had previously watched, so that he was concerned about ground loop and was not able to operate the control stick toward the left.

	<p>(6) Involvement of the captain to the control</p> <p>The captain stated that the control of the trainee had no particular problems until the Aircraft deflected to the right after landing and takeover of control was unnecessary.</p> <p>(7) Control of Landing based on flight experiences</p> <p>The captain and the trainee belong to Fukushima Motor Glider Club (FMGC) Sendai branch, in which many of club members have sufficient flight experiences by glider. When the glider repeatedly makes taking off and landing, manpower and time are required for moving the glider back to the departure point after landing. In order to save them, the club members have usually utilized a touchdown maneuver with the brake applied so as to stop the glider in as short a distance as possible when they make a landing. The trainee and the captain stated that they had long experience of glider, making such control was a custom.</p>
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### 3 ANALYSIS

<b>3.1 Involvement of Weather</b>	Yes
<b>3.2 Involvement of Pilots</b>	Yes
<b>3.3 Involvement of Aircraft</b>	None
<b>3.4 Analysis of Findings</b>	<p>(1) Effects by weather</p> <p>It is probable that the crosswind blew with a gust from the left side across Runway 32 in Fukushima Sky Park during the accident as described 2.6(2). The Aircraft underwent a gust from the left side during landing roll, and the left main wing tended to up, imposing more loads on the right main wheel than the left main wheel with the spoiler lever pulled; therefore, it is probable that the brake was effected asymmetrically.</p> <p>(2) Flight control of the pilot</p> <p>It is probable that the unsuccessful recovery from the conditions in which more loads were imposed on the right main wheel is because the appropriate measures such as operating the control stick toward the left were not taken when the Aircraft underwent a gust from the left side during landing roll, though the Aircraft touched down to the runway without bank due to the temporal headwind before and after the touch down.</p> <p>It is probable that this is because the trainee was concerned about the ground loop during landing under crosswinds from the left side and hesitated to operate the control lever toward the left considering the previous experiences, so that the appropriate measures were not taken for the crosswinds.</p> <p>(3) Directional control</p> <p>It is possible that the contact of the tail wheel on the ground has not been completed and that the steering of the tail wheel did not work, because the contact marks of the tail wheel intermittently existed on the runway.</p>

	<p>In addition to this, it is probable that the Aircraft deflected more in the right direction and ran out of the runway by increasing the friction between the right main wheel and the runway, because the wheel brakes were excessively used under the conditions where more loads were imposed on the right main wheel.</p> <p>(4) Use of brake</p> <p>The excessive use of wheel brakes may cause ground loop for tail wheel aircrafts; therefore, it is probable that the attention needs to be paid to the use of brakes as described in 2.7(3).</p> <p>With regards to the fact that the trainee applied wheel braking before the tail wheel touched down to the runway, it is probable that an intention to make stopping the glider in as short a distance as possible after landing was strongly expressed from the previous flight experiences of gliders.</p> <p>(5) Damage</p> <p>It is probable that the Aircraft ran out of the runway and caught the main wheels of both sides in the ditch, causing the impact which ruptured the mounted bolt of the main landing gear. As the result, it is probable that the main landing gear was rotated about 90° to the rearward and the rear part of the fairing of the main wheels stuck into the lower surface of the main wing, causing the damage to the fuselage. In addition, it is highly probable that the nose downed, then the propeller hit the ground, causing the breakage of the wooden propeller blades, when the main wheels were caught in the ditch.</p>
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#### 4 PROBABLE CAUSES

In this accident, it is probable that the Aircraft ran out of the runway during landing, and the bolt of the belt mounted on the main landing gear was ruptured due to the ditch established parallel to the runway, so that the fairing of the main wheels made the fuselage be damaged. It is probable that the fact that the Aircraft ran out of the runway was because effect of the right wheel brake became to asymmetry due to the inappropriate control to crosswind with a gust.

#### 5 SAFETY ACTIONS

In Fukushima Motor Glider Club (FMGC) Sendai branch to which the captain and the trainee belong, the following recurrence prevention measures were publicized.

##### 1. Using brake of the Aircraft

- (1) To apply wheel braking after the Aircraft touches down on the ground and the speed is sufficiently reduced
- (2) To temporarily put back the spoiler lever when the Aircraft contacts the ground in the case of making approach with the dive-brake (spoiler) fully extended

##### 2. Training flight

To have a briefing for sufficient time and reinforce its contents before and after the training flight, and conduct safe and efficient training by reviewing the trainee's flight

##### 3. Sharing of incidents

To create an incident report in format, if the incident to be reported occurred, inform and circulate it to club members, and accumulate the shared information as "Incident cases"