

AA2016-9

**AIRCRAFT ACCIDENT
INVESTIGATION REPORT**

**GENERAL INCORPORATED ASSOCIATION SHIZUOKA
PREFECTURE AERONAUTICAL ASSOCIATION
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November 24, 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.

Kazuhiro Nakahashi
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

GENERAL INCORPORATED ASSOCIATION SHIZUOKA
PREFECTURE AERONAUTICAL ASSOCIATION
PIPER PA-18-150, JA4048
AIRFRAME DAMAGE DUE TO RUNWAY EXCURSION
DURING LANDING
FUJIKAWA GLIDING FIELD, SHIZUOKA CITY,
SHIZUOKA PREFECTURE

AT ABOUT 12:06 JST, DECEMBER 20, 2015

November 4, 2016

Adopted by the Japan Transport Safety Board

Chairman	Kazuhiro Nakahashi
Member	Toru Miyashita
Member	Toshiyuki Ishikawa
Member	Sadao Tamura
Member	Keiji Tanaka
Member	Miwa Nakanishi

1. PROCESS AND PROGRESS OF INVESTIGATION

1.1 Summary of the Accident	The Piper PA-18-150 JA4048 owned by General Incorporated Association Shizuoka Prefecture Aeronautical Association on Sunday, December 20, 2015, veered off the runway to the right at the time of landing at Fujikawa gliding field, and then overturned on the bush; accordingly, the airframe was damaged. The captain was only on board and did not suffer injury. No fire occurred.
1.2 Outline of the accident investigation	The Japan Transport Safety Board appointed an investigator-in-charge and an investigator to investigate this accident on December 20, 2015. Representative of the United States of America as the State of Design and Manufacture of the aircraft participated in the investigation. Comments were invited from parties relevant to the cause of this accident. Comments on the draft report were invited from the relevant State.

2. FACTUAL INFORMATION

2.1 History of the flight	According to the statement of the captain, the history of the flight is summarized as below. On December 20, 2015, the Piper PA-18-150 JA4048 owned by General Incorporated Association Shizuoka Prefecture Aeronautical Association was conducting the second flight to tow a glider (hereinafter referred to as "towing flight") by the maneuvering of the captain in Fujikawa gliding field (hereinafter referred to as "the gliding field").
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The aircraft, after took off from the runway 18 of the gliding field with towing a glider, let the glider release in the vicinity of Mt. Kanamaru placed north-west from the gliding field, flew on the sea of the south at an altitude of about 1,500ft; thereafter, passed over the gliding field at an altitude of about 1,000ft, as turned to the northeast direction. When the captain checked the windsock of the gliding field at that time, it was in a state of landing.

Thereafter, when the aircraft flew to the north, the captain after checking the speeds, turn onto the final approach course on runway 18 for landing, by down the flap by one-step and turning left in front of the Tokaido Shinkansen Bullet Train Fujikawa railroad bridge. Usually the aircraft used to pass through over of the National Route No.1 at altitude 300 ft and airspeed 60 mph; however, at that time the aircraft was at altitude 350 ft and airspeed 65 mph; therefore, the approach path angle had to become higher. The captain thought that the reason why the aircraft did not become the normal altitude and speed at this point, was because of the influence of the tail wind. (See Fig 1)

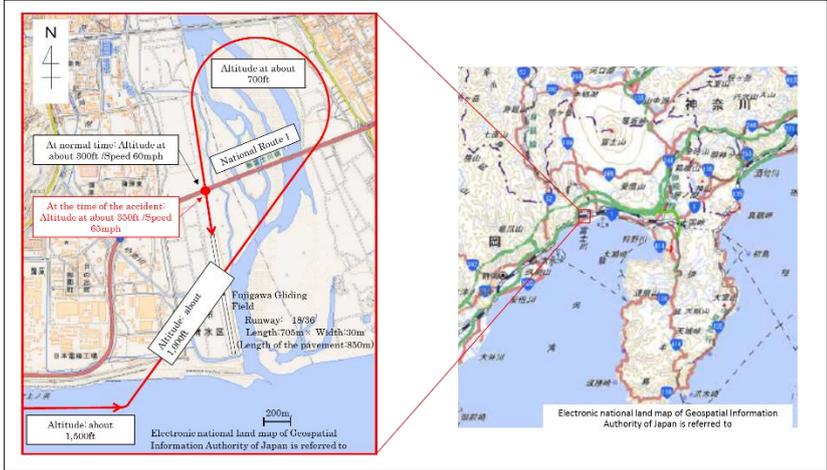
The captain continued to approach while keeping the flap at the lowest position and dropped the towrope at the drop position just before the runway. He then entered in the landing attitude; however, feeling that he had been carried away to the west side (right hand side), with the left wing-low *1 instantly. Together he thought that he operated on the right rudder unconsciously.

Feeling that the ground speed was slightly faster than normal the captain raised the nose but the speed did not decreased; therefore, the main wheels grounded at first on the right side of the center line of the runway beyond the runway halfway marking, although usually touched down the ground used the three points (left and right main wheels and tail wheel). The captain pulled the control column toward him all out trying to touch down the tailwheel to the ground as early as possible, and then the aircraft deflect to the right side and veered off to the grass area on the right side of the runway. He had been operating the rudder to adjust the direction but he could not succeed it, then he released the foot from the rudder pedal to operate the brake pedal in order to decelerate; however, as the aircraft was approaching the bush just in front of him, he stepped in the brake pedal to the full extent knowing that the aircraft might roll forward; accordingly, the aircraft rolled forward, overturned, and struck on the bush.



Photo 1 Glider Towing Flight
(Conceptual drawing)

*1 The wing-low means a process for approach while gliding sideways by lowering the windward wing in order to get the longitudinal axis of the aircraft in line with the centerline of the runway in a final step of approach.

	 <p style="text-align: center;">Fig. 1 Estimated Flight Route</p> <p>After the aircraft came to a stop, he turned off the master switch and the ignition switch, and turned off the fuel cock also, because the engine had been stopped. As he had been dangled from the seatbelt, he unfastened it, and opened the entrance door and then got out. This accident occurred on the bush area in the gliding field (Latitude 35°07' 07" N and Longitude 138° 37' 54" E) at about 12:06 JST (Japan Standard Time: UTC+9 hrs.), on December 20, 2015.</p>
2.2 Injuries to Persons	None
2.3 Damage to Aircraft	<p>Extent of Damage: Substantially damaged</p> <ul style="list-style-type: none"> • Bent of the strut of the main wing • Wrinkles of the airplane cloth the bottom main wing • Bending of the propeller Others  <p style="text-align: center;">Photo 2 Accident Aircraft</p>
2.4 Personnel Information	<p>Captain: Male, Age 61 Commercial Pilot Competence Certificate (Airplane) Expiry of practicable period for flight: June 16, 2003 Special pilot competence (Single-Engine land) : April 20, 2017 Class 1 Aviation Medical Certificate Certificate validity: July 11, 2016 Total flight time: 532 hr. 20 min. Flight time on the type aircraft: 6 hr. 50 min.</p>
2.5. Aircraft information	<p>Aircraft type: Piper PA-18-150 Serial number: 3076 Date of manufacture: January 31, 1989 Certificate of airworthiness: No. Tou-27-079 Validity: May 19, 2016 Total flight time: 3,214 hr. 40 min.</p>
2.6 Meteorological Information	<p>According to the statement of the captain, the weather conditions of the day was roughly clear, moderate wind from north-northeast, and visibility was 10 km. The windsock, that captain was confirmed while flying over the runway just before the accident occurred, was in a state of hanging.</p>
2.7 Information about the accident site	<p>The gliding field has a pavement by length of 850 m and width of 30 m, the runway has been used as a 705 m length. The directions of the runway were 180 ° and 360 °.</p>

The accident site was the bush area located 133 m north to the terminal end of runway 18 and approximately 15 m to the west from the runway long side. The aircraft was overturned on top of the bush. The height of the bush was about 2 m. (See Fig. 2)

It was not able to confirm the trace of the aircraft on the runway, but the tire marks of the tailwheel were remained for as long as 30 m on the grass area of the runway side. Incidentally, the tire marks initially gently draw a curve to the right, and then it was almost straight ahead. (See Fig. 3)

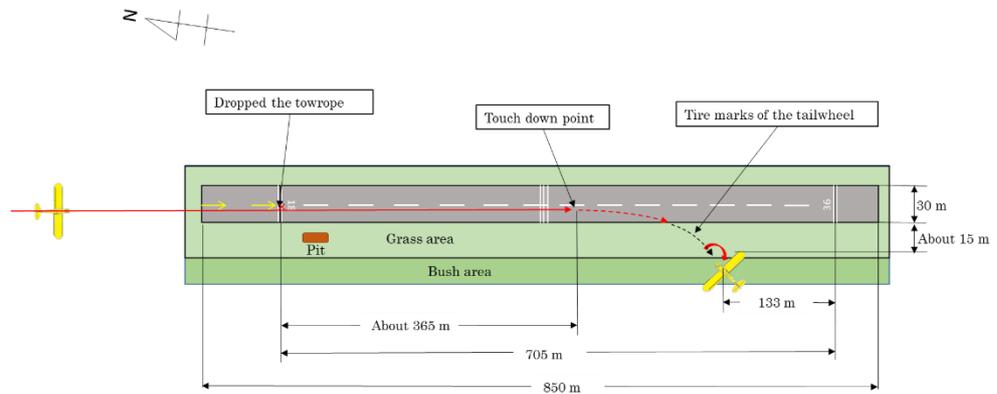


Fig. 2 Details for the Fields

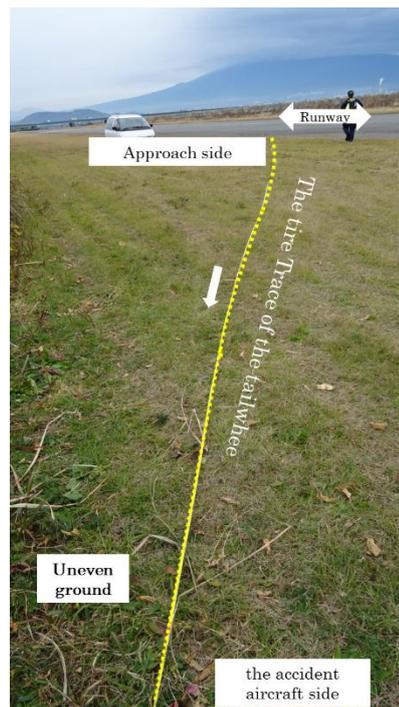


Fig. 3 The tire Trace of the tailwheel

2.8 Additional Information

(1) Standard return back procedure in towing flight of General Incorporated Association Shizuoka Prefecture Aeronautical Association

The association has a standard take-off and landing procedures for a towplane and they are shared within the association through the training. The captain, based on these procedures, had complied it and prepared "The Points of Towing by Aircraft," according to this, the main return back procedure after release of glider was as follows.

- (i) After flew on the sea, return back along the coastline.
- (ii) Aiming to reach an altitude of 1,000 ft over the south end of the runway, but do not fly below 1,000 ft above land area.

	<p>(iii) As over the runway, make a radio contact for the landing.</p> <p>(iv) Commence descent after passing over the runway, check the speed limit for down the flap, down the flap by one-step and keep the speed to 75 mph.</p> <p>(v) Fly along the National Route No.1 (Yui bypass) and down the flap to the full, pass through the fly over the same road at speed 60-65 mph and altitude 350-400 ft, and approach the runway while descending to pass the runway end fly at an altitude of 200ft.</p> <p>(vi) Maintaining the altitude at 200 ft, drop the towrope at the drop position just before the runway, and then shifts to the landing attitude aligning the aircraft heading with the runway heading. When there is a cross wind component, apply the wing-low.</p> <p>(vii) After landing, straight landing roll in use the rudder while fully pulling the control column. Full up the flap as soon as possible.</p> <p>(viii) If the aircraft is almost stopped by actuating the appropriate amount braking, turn and go back on the runway.</p> <p>(2) Direction control of the aircraft during taxiing The direction control during taxiing of the aircraft shall be carried out mainly by braking on the left and right main wheels On the other hand, the direction control on the landing and taking off rolls is carried out by the rudder operation and the tailwheel of orientation linked to this. Interlocking of the rudder operation and the orientation of the tailwheel is connected to the tail wheel via rudder, arm, chain and spring, the mechanism is constructed in order that the tail wheel is faced to the operation direction of the rudder.</p>
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3. ANALYSIS

3.1 Involvement of Weather	None
3.2 Involvement of Pilot	Yes
3.3 Involvement of Gliders	None
3.4 Analysis of Findings	<p>(1) Weather conditions at the accident occasion According to the statement of the captain, weather conditions of the day was roughly clear, the wind direction north-northeast with a little weak, and visibility was 10 km; beside, it is probable that there was no wind or breeze, because the windsock in the gliding field was in a state of hanging just before the time of the accident; accordingly, it is highly probable that the weather at the time of the accident was no involvement in this accident.</p> <p>(2) Situation at the time of the airframe damage The captain, after veering off the runway, although made the rudder operation aiming at the recovery but could not change the direction; therefore, he tried to decelerate by the braking. As the bush had approached beside the runway just in front of him, he activated the brake strongly. Partly because it approached to the uneven ground near the bush, the aircraft rolled forward, overturned, and place on the bush. It is highly probable that the airframe had damaged at that time.</p> <p>(3) Judgment and operations of the captain Captain, when making the final approach to the runway according to a given procedure, entered in the landing attitude after dropping the towrope at the dropping point on the runway threshold marking, but felt that he had been yawed to the right, it is probable that he took the</p>

left wing-low instantly and pushed the right rudder in order to keep the direction of the aircraft.

Feeling that the ground speed was slightly faster than normal the captain made a nose up but it is probable that the main wheels of the aircraft touched the ground first. The captain, as the touch down point was just beyond the halfway marking, pulled the control column toward him all out trying to let the tailwheel to touch the ground; however, as the rudder had been in the situation to have been operated to the right direction and the tailwheel was in the direction to turn the nose to the right side; accordingly, it is probable that the aircraft began to deflect to the right side in favor of the rudder and the tailwheel, and veered off the runway to the grass area on the west side of it.

The captain tried the direction control by the rudder till the aircraft deviation from a runway and operated brakes; besides, the tire marks of the tailwheel which remained in grass area was initially gently drawing a curve to the right, and then almost straight ahead. It has a tendency to swing the nose during the turn by the characteristics of the tailwheel type landing gear; it is probable that it was not possible to adequately correct the deflection in the right direction in the rudder operation.

After then, concerning that the aircraft rolled forward and overturned, it is probable that the captain took the full braking operation when the aircraft was approaching the bush area forward, and that the ground near the bush was in an uneven, was a contributory factor.

(4) Safety ensuring of the towplane flight

As it is probable that this accident would not have occurred, if the captain executed a go-around at the time when he felt that the ground speed was relatively higher and when he passed the touch down point beyond the halfway marking of the runway, it is required to operate the aircraft by placing the safety first consciousness to the highest priority.

In addition, in the return back procedure of a series of approaching to the runway, dropping the towrope, and landing, it is eventually forced to make landing on the runway at a high path angle, also the effective runway length usable for the landing becomes inevitably shorter; therefore, it is probable that it is difficult to perform the same procedure always properly.

From these points, in the association, from the standpoint of safety ensuring of the future flight, it is desirable to consider the need for a review of the return back procedure of the towplane, including separation of the dropping of towrope and landing, by letting the towrope drop first; and then separately let the approach and land on the aircraft on the gliding field later, or equip the aircraft with a tow winding device.

4. PROBABLE CAUSES

In this accident, it is highly probable that after the aircraft had veered off the runway to the right, it rolled forward and overturned; thereafter, the aircraft has caught the damage.

Regarding the aircraft has veered off the runway, it is probable that it deflected as the rudder had been operated to the right, and then the tailwheel was directed toward the directing nose to the right when the tailwheel touching down the ground, and the subsequent correction operation by the rudder was not also effective due to the characteristics of the landing gear of the tailwheel type aircraft.

5. SAFETY ACTION

In the General Incorporated Association Shizuoka Prefecture Aeronautical Association, receiving the outbreak of this accident, it has called the attention of pilots of a towplane through a study session, also, it has considered the following measures to prevent recurrence is under consideration.

- (i) If there is anything different from the normal landing even a little at the time of landing, including to resume landing, to ensure the safety first.
- (ii) In the flight training of a towplane, a skill that can maneuver was so loaded with experience of the tailwheel type depending on the characteristics of the aircraft, trainees to be able to grasp.
- (iii) To examine the possibility to equip a towplane with the towrope winding device.