



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Teterboro, NJ	<b>Accident Number:</b>	NYC05LA089
<b>Date &amp; Time:</b>	05/31/2005, 1130 EDT	<b>Registration:</b>	N22DW
<b>Aircraft:</b>	Swearingen SA-226T	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 Serious
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

During takeoff from the departure airport, as the pilot advanced the throttles, the aircraft made a "sudden turn to the right." The pilot successfully aborted the takeoff, performed an engine run-up, and then took off without incident. The pilot experienced no anomalies during the second takeoff or the flight to the destination airport. As he reduced the power while in the traffic pattern, at the destination airport, the left engine accelerated to 60 percent power. The pilot reported to the tower that he had "one engine surging and another engine that seems like I lost control or speed." The pilot advanced and retarded the throttles and the engines responded appropriately, so he continued the approach. As the pilot flared the airplane for landing, the left engine surged to 65 percent power with the throttle lever in the "idle" position. The airplane immediately turned to the right; the right wing dropped and impacted the ground. Disassembly of the engines revealed no anomalies to account for surging, or for an uncommanded increase in power or lack of throttle response. Functional testing of the fuel control units and fuel pumps revealed the flight idle fuel flow rate was 237 and 312 pounds per hour (pph), for the left and right engines, respectively. These figures were higher than the new production specification of 214 pph. According to the manufacturer, flight idle fuel flow impacts thrust produced when the power levers are set to the flight idle position and differences in fuel flow can result in an asymmetrical thrust condition.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper decision to depart with a known deficiency, which resulted in a loss of control during landing at the destination airport. A factor was the fuel control units' improper flight idle fuel flow rate.

## Findings

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Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: LANDING

Findings

1. (F) FUEL SYSTEM, FUEL CONTROL - EXCESSIVE FLOW/OUTPUT
2. (C) OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - PILOT IN COMMAND

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Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: LANDING

Findings

3. TERRAIN CONDITION - GROUND

## Factual Information

### HISTORY OF FLIGHT

On May 31, 2005, at 1130 eastern daylight time, N22DW, a Swearingen SA-226T, was substantially damaged while landing at Teterboro Airport (TEB), Teterboro, New Jersey. The certificated private pilot was seriously injured. Visual meteorological conditions prevailed, and no flight plan was filed for the flight, which originated at the Nantucket Memorial Airport (ACK), Nantucket, Massachusetts at 1038. The personal flight was conducted under 14 CFR Part 91.

According to the pilot, during takeoff from ACK, as he advanced the throttles, the aircraft made a "sudden turn to the right." He responded by applying the brakes, and repositioned the airplane on the runway centerline. He then performed a short forward roll and engine run-up to check for abnormalities, but noted none, and again added power to continue the takeoff.

The pilot experienced no problems with the airplane during the subsequent takeoff or the flight to TEB. He entered the traffic pattern at TEB, and "set the power to 30 percent, with half flaps and gear extended." He then turned onto the base leg and reduced the power to 20 percent, at which time the left engine accelerated to 60 percent power. The pilot then pulled both power levers to the "full off" position. The left engine did not respond, and the pilot advised the tower of the situation. The pilot noted there were "pulsating surging noises from the asymmetrical thrust and props," and reported to the tower that he had "lost control of one engine and the other engine was surging." He then advanced the right power lever to 60 percent, and the surging stopped. The pilot advanced the power levers to 80 percent to check the control on the left engine, and both engines responded appropriately. He then retarded both power levers to 20 percent, and both engines again responded evenly, so he decided to continue the approach. When the pilot thought he would make it to the runway, he reduced power on both engines to the 'idle' position and they responded evenly.

The pilot reported that as he flared the airplane for landing, at approximately 90 knots, the left engine surged to 65 percent power with the throttle lever in the 'idle' position. The airplane immediately turned to the right, the right wing "dropped" 30 degrees and impacted the ground.

An air traffic controller at ACK observed the airplane during its departure. According to the controller, the pilot was cleared for takeoff on runway 06, and the controller observed the pilot initiate his departure roll. Several seconds later, the controller observed the airplane performing a 360-degree turn in the displaced threshold of runway 06. The pilot then transmitted that he had a problem during the takeoff, and was "trying it again." The controller then observed the airplane depart, with no further anomalies noted.

A witness who was mowing the grass at ACK, near the departure end of runway 06 also observed the airplane during its takeoff. According to the witness, the pilot performed a run-up inspection, during which the engines "didn't sound right." The pilot continued onto the runway, initiated a takeoff by adding full power, and then seconds later aborted the takeoff and returned to the approach end of the runway.

A review of air traffic control (ATC) communications between the pilot and the Teterboro tower controller revealed that while the pilot was on final for runway 01, he stated, "I gotta problem here...I got an engine surging and another engine that seems like I lost control or speed." The tower controller then asked the pilot, "OK, can you make it to the runway?" The

pilot responded, "...a yeah." No further transmissions were received from the pilot.

A witness who was in his car, at a traffic light perpendicular and just prior to the threshold of runway 01, observed the airplane during its final approach to the runway. The witness stated that as the airplane passed over the street, its right wing was about 45-degrees low. The airplane then impacted the ground and a postcrash fire ensued.

#### PILOT INFORMATION

Examination of the pilot's logbook revealed the last entry was on December 8, 2004. At that time he had accumulated 2,670 hours of total flight experience in single-engine aircraft, and 2,014 hours of total flight experience in multi-engine aircraft. According to the pilot, he had accumulated 6 hours of flight experience in the 10 days preceding the accident, which were not recorded in his logbook. He also reported approximately 1,400 hours of flight experience in the accident airplane.

#### AIRCRAFT INFORMATION

The airplane was powered by two Honeywell TPE331-10U-512G engines. Examination of the airplane and engine logbooks revealed the most recent entry was dated May 28, 2004, at which time "Fairchild A, B, C, and D checks were performed," as well as a "Honeywell routine inspection." No anomalies were recorded in the logbook entry.

#### METEOROLOGICAL INFORMATION

Weather reported at TEB at 1151 included variable wind at 6 knots, 10 miles visibility, clear skies, temperature 75 degrees Fahrenheit, dew point 52 degrees Fahrenheit, and barometric pressure of 30.02 inches Hg.

#### WRECKAGE INFORMATION

Examination of the accident site by a Federal Aviation Administration (FAA) inspector revealed that the airplane's initial impact point was approximately 7 feet past the blast pad, on the displaced threshold of runway 01. The impact point was a gouge in the pavement where the right main landing gear impacted and separated from the airplane. The airplane then traveled approximately 24 feet off the east (right) side of the runway, and 208 feet parallel to the runway coming to rest upright in the grass, on an approximate 120-degree heading. Examination of the cockpit controls revealed the left power lever was in the 3/4 forward position, and the right power lever was in the flight idle position. The left propeller lever was in the 3/4 forward (high) position and the right propeller lever was in the aft (low) position. The engine feather controls were in the "unfeathered" position for both engines. The fuel quantity indicator read 1,000 pounds for the left tank and 8,500 pounds for the right tank. The left and right fuel valve shutoffs were in the "open" positions. The cross flow valve was in the "closed" position. The main fuel switch was in the "off" position. The flap handle was observed in the first detent.

The right side of the airplane sustained severe postcrash fire damage, and the outboard section of the right wing separated from the inboard section, outboard of the right engine. All four propeller blades of the right engine displayed S-bends, and their tips were curled.

The left side of the airplane sustained fire damage from the nose to the leading edge of the wing. The entire left wing remained attached to the fuselage; however, the outboard half of the

wing was bent upward at a 30-degree angle. All four propeller blades of the left engine also displayed S-bends, and their tips were also curled.

#### TESTS AND RESEARCH

Both engines were completely disassembled at the manufacturer, under the supervision of a National Transportation Safety Board investigator. Examination of the engines revealed indications of rotation and operation at the time of impact. Additionally, the left engine displayed indications that the power section continued to operate for an undetermined period of time after the impact. The examination of both engines did not reveal any condition that would account for surging in either engine, or for an uncommanded increase in power or lack of throttle response in the left engine.

The fuel control unit (FCU) and the respective fuel pump for each engine were tested at the FCU manufacturer, under the supervision of a Safety Board investigator. Functional testing of the assemblies revealed the flight idle fuel flow for both engines was higher than new production specification of 214 pounds per hour (pph). Testing of the FCUs from the left and right engines revealed a flight idle fuel flow rate of 237 pph and 312 pph respectively. According to the manufacturer, flight idle fuel flow impacts thrust produced when the power levers are set to the flight idle position. Differences in fuel flow at flight idle can result in an asymmetrical thrust condition when both engines are set to the flight idle position.

The propeller governors were also tested at their manufacturer, under the supervision of an Safety Board investigator. Testing of the governors revealed they functioned within manufacturer specifications and no anomalies were identified.

A sample of fuel was taken from the fuel filter of each engine. The left engine fuel sample appeared pink in color and had an odor not consistent with jet fuel. The right engine fuel sample appeared clear in color, and had an odor consistent with jet fuel. A water paste test performed on both samples of fuel was negative for water. Further fuel testing revealed the left sample indicated oxidation, consistent with exposure to heat. No contamination was noted in either sample.

#### ADDITIONAL INFORMATION

The pilot added 200 gallons of Jet A fuel in ACK prior to his departure on May 31, 2005. A sample of fuel was taken from the fuel truck which fueled the airplane, and no contamination or water was noted in the sample. Additionally, three aircraft which were fueled by the same fuel truck after the accident airplane reported no anomalies with the fuel.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	65, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 With Waivers/Limitations	<b>Last FAA Medical Exam:</b>	12/01/2003
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	12/01/2004
<b>Flight Time:</b>	2676 hours (Total, all aircraft), 1400 hours (Total, this make and model), 0 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Swearingen	<b>Registration:</b>	N22DW
<b>Model/Series:</b>	SA-226T	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	T317
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	
<b>Date/Type of Last Inspection:</b>	05/01/2004, Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo Prop
<b>Airframe Total Time:</b>	4698 Hours as of last inspection	<b>Engine Manufacturer:</b>	Airesearch
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	TPE331-10U-51
<b>Registered Owner:</b>	Maci Leasing Corporation	<b>Rated Power:</b>	900 hp
<b>Operator:</b>	Dominick Alfieri	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	TEB, 9 ft msl	Distance from Accident Site:	
Observation Time:	1151 EDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	Variable	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.02 inches Hg	Temperature/Dew Point:	24° C / 11° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Nantucket, MA (ACK)	Type of Flight Plan Filed:	None
Destination:	Teterboro, NJ (TEB)	Type of Clearance:	None
Departure Time:	1038 EDT	Type of Airspace:	

## Airport Information

Airport:	Teterboro Airport (TEB)	Runway Surface Type:	Asphalt
Airport Elevation:	9 ft	Runway Surface Condition:	Dry
Runway Used:	01	IFR Approach:	None
Runway Length/Width:	7000 ft / 150 ft	VFR Approach/Landing:	Traffic Pattern

## Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	40.850000, -74.060833

## Administrative Information

Investigator In Charge (IIC):	Jill M Andrews	Report Date:	09/27/2007
Additional Participating Persons:	Ali Ispahany; FAA/FSDO; Teterboro, NJ Jim Allen; Honeywell Engines; Pheonix, AZ		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinquiry@ntsb.gov">pubinquiry@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).