Aviation Investigation Final Report

Location:	TAUNTON, Massachusetts	**Accident Number:**	NYC98FA117
Date & Time:	May 26, 1998, 18:45 Local	**Registration:**	N1189Z
Aircraft:	MORELLI RANS S9	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot had been making adjustments to the carburetors on the 2 cycle, non-certificated engine. He was flying the homebuilt airplane without the engine cowling or canopy in place. While circling near the airport, the airplane was observed to enter a spin and it disappeared from view in a near vertical nose down attitude. No evidence of a mechanical failure or malfunction was found with the airplane or engine. The Chief Engineer for the kit manufacturer reported, '...The flying qualities would have been altered due to the large increase in drag and disruption of the airflow over the fuselage and tail surfaces. The aircraft stall and spin characteristics could have been dramatically changed from previously tested configurations. The assembly manual and flight operations manuals clearly indicate that the cowl and canopy should be in place before flying the aircraft and that operation of the aircraft in any other configuration is not approved.'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's operation of the aircraft in an unapproved configuration contrary to procedures resulting in diminished aircraft control, and his failure to maintain control of the aircraft resulting in a stall/spin event. Contributing factors were the non-installation of the canopy and engine cowling during flight.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
1. (F) WINDOW,CANOPY - NOT INSTALLED
2. (F) NACELLE/PYLON,FAIRING - NOT INSTALLED
3. (C) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
4. AIRCRAFT CONTROL - DIMINISHED
5. STALL/SPIN
6. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On May 26, 1998, about 1845 eastern daylight time, a homebuilt Rans S9, N1189Z, was destroyed when it struck a tree in Massasoit State Park, Taunton, Massachusetts. The certificated private pilot was fatally injured. Visual meteorological conditions prevailed for the local post maintenance flight, which had departed from Taunton, Massachusetts. No flight plan had been filed for the flight that was conducted under 14 CFR Part 91.

According to an inspector from the Federal Aviation Administration (FAA), the pilot was observed to adjust the carburetors and fuel metering jets on the engine after two preceding flights. He then departed on the third flight which terminated in the accident.

One witness reported:

"Small homebuilt aircraft passed over my home at about 1000 feet altitude from west to east. Aircraft attracted my attention due to high pitch of engine. Aircraft made an oval out over Massasoit State Park and back over my neighborhood. Watched aircraft make a 720 degree turn out over Massasoit State Park...Direction was counterclockwise, appx. angle of bank 30-45 degrees. As aircraft came around I noticed it drop abruptly 50-100 feet as it stalled. It then seemed to enter a spin and it disappeared from view in a near vertical nose down attitude. Spin rotation was to the left. Very loud impact sound soon followed. Altitude as [airplane] disappeared from view appx. 500 - 600 feet AGL."

In a follow-up telephone interview, the witness reported that he could hear the engine of the airplane when it passed over him, but that due to distance from the airplane when it entered the spin, he could not hear if the airplane engine was operating. He said the spin entry was abrupt, and not preceded by a change in airplane attitude.

Another witness saw the airplane circling overhead and also heard the engine. He reported that the engine stopped and a few seconds later he heard an impact noise.

The local police were notified, and the airplane was found after a few minutes in a densely wooded area, about 1/2 mile from the approach end of runway 30. The accident occurred during the hours of daylight at 41 degrees, 52.21 minutes north latitude and 70 degrees, 59.94 minutes west longitude.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with an airplane single engine land rating. The

pilot's logbook was not recovered. According to FAA records, the pilot's total flight time was in excess of 900 hours.

He was issued a restricted third class FAA airman medical certificate on February 4, 1998, that was valid for 12 months. He was also required to wear corrective lenses.

He was also issued a repairman certificate for his homebuilt airplane. The repairman certificate allowed him to perform maintenance on the airplane that would normally have required a mechanics certificate.

WRECKAGE AND IMPACT INFORMATION

On-site examination of the wreckage revealed impact marks on the east side of a 75 foot high tree, and debris to the west of the tree on the ground. The engine was separated from the firewall and remained attached to the airplane with the starter pull chord. Both wings had separated from the fuselage, and both fiberglass fuel tanks were ejected from their wings. About 1 quart of gasoline was observed in one fuel tank. No evidence of the engine cowling or canopy was found at the accident site.

The airplane was moved to the pilot's hangar at Taunton Airport for further examination. The engine cowling and canopy for the airplane were found there.

The engine was rotated by hand and compression was found in both cylinders. No evidence of scoring was visible on the sides of the pistons, as viewed through the exhaust ports. The spark plugs had oil on the electrodes, and produced spark when placed in a spark plug tester. Fuel was found in the fuel line leading to the engine driven fuel pump. The fuel selector had been turned off by emergency personnel at the accident site.

The pilot had installed a ground adjustable wooden propeller. Both blades were broken off flush with the hub.

Flight control continuity was verified to the rudder and elevator. The aileron control cables were intact at the fuselage and separated from the wings.

The airplane had accumulated a total time of 11.3 hours at the time of the accident.

MEDICAL AND PATHOLOGICAL INFORMATION

Toxicological testing was conducted by the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma.

An autopsy was conducted at the Massachusetts Regional Medical Examiner's Office in Pocasset, Massachusetts, on May 27, 1998.

TESTS AND RESEARCH

One carburetor remained on the engine and the other was recovered at the accident site. Examination of the carburetors at LEADING EDGE AIR FOILS, INC. revealed no deficiencies. The carburetor synchronization could not be determined due to the separation of one carburetor from the engine.

ADDITIONAL INFORMATION

The airplane was mid-wing design with conventional landing gear. It was fitted with a two cylinder, air-cooled Bombardier Rotax 503 UL DCDI, two stroke, non-certificated engine.

According to a letter from the Chief Engineer of RANS, the kit designer:

"The Rans S-9 constructed by...[the pilot] was operated in a configuration untested by the kit manufacturer."

"The aircraft was flown without the engine cowling and canopy in place. The flying qualities would have been altered due to the large increase in drag and disruption of the airflow over the fuselage and tail surfaces. The aircraft stall and spin characteristics could have been dramatically changed from previously tested configurations."

"The assembly manual and flight operations manuals clearly indicate that the cowl and canopy should be in place before flying the aircraft and that operation of the aircraft in any other configuration is not approved."

The airplane was released to the next of kin on May 28, 1998.

Pilot Information

Certificate:	Private	**Age:**	50,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Center
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	February 4, 1998
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	900 hours (Total, all aircraft), 11 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	MORELLI	**Registration:**	N1189Z
Model/Series:	RANS S9 RANS S9	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	1291103
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	November 1, 1997 Annual	**Certified Max Gross Wt.:**	670 lbs
Time Since Last Inspection:	11 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	11 Hrs	**Engine Manufacturer:**	Rotax
ELT:	Not installed	**Engine Model/Series:**	503
Registered Owner:	DENNIS S. MORELLI	**Rated Power:**	47 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	TAN ,43 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	18:52 Local	**Direction from Accident Site:**	320°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	24°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(TAN)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	00:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	TAUNTON TAN	**Runway Surface Type:**	Asphalt
Airport Elevation:	43 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Hancock, Robert
Additional Participating Persons:	WILLIAM STEVENS; BEDFORD , MA RICHARD BUNKER; BOSTON , MA
Original Publish Date:	June 21, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46076