



National Transportation Safety Board Aviation Accident Final Report

Location:	REDMOND, OR	Accident Number:	SEA97LA096
Date & Time:	05/02/1997, 1515 PDT	Registration:	N6291X
Aircraft:	HENDRIX TALON XP	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The owner/builder (pilot) of the kitplane had accrued approximately 70 hours of operating time on the aircraft. During a flight, he began to lose aileron control. Shortly after entering downwind for landing, all aileron and elevator control were lost, and the pilot actuated the aircraft's ballistic parachute. Postcrash examination revealed that the pilot had installed only the forward flight control stick and torque tube, and had not installed either the rear flight control stick nor the interlink tube. This absence resulted in a structurally weakened control system and subsequent disconnect of the forward flight control stick from the torque tube in torsional overload. There was no caution note within the kitplane assembly instructions advising the builder that failure to install either the aft control stick and/or interlink tube would result in a compromise of the structural integrity of the fore and aft stick, torque tube and interlink tube assembly.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: incomplete installation (omission of the aft control stick and interlink tube) of the flight control system, resulting in failure of the combined (torque) elevator and aileron rod and a disconnection of the forward flight control stick from the ailerons and elevators.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: APPROACH - VFR PATTERN - DOWNWIND

Findings

1. (C) MAINTENANCE, INSTALLATION - INADEQUATE - OWNER/BUILDER
2. INFORMATION INSUFFICIENT - KIT MANUFACTURER
3. (C) FLT CONTROL SYST, ELEVATOR CONTROL CABLE/ROD - FAILURE
4. (C) FLT CONTROL SYST, AILERON CONTROL CABLE/ROD - FAILURE
5. (C) FLT CONTROL SYST, YOKE/CONTROL STICK - DISCONNECTED

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - VFR PATTERN - DOWNWIND

Findings

6. AIRCRAFT CONTROL - NOT POSSIBLE
7. MISC EQPT/FURNISHINGS, PARACHUTE/DROP CHUTE
8. EMERGENCY EQUIPMENT - SELECTED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - EMERGENCY

Factual Information

HISTORY OF FLIGHT

On May 2, 1997, approximately 1515 Pacific daylight time, a homebuilt Hendrix Talon XP, N6291X, being flown by the owner/builder, a private pilot, was substantially damaged during impact with terrain following a loss of control in flight while entering downwind to land at the Cline Falls private airstrip, Redmond, Oregon. The pilot, occupying the forward seat, sustained minor injuries. Visual meteorological conditions existed at the time and no flight plan had been filed. The flight, which was personal, was to have been operated under 14CFR91, and originated from Sisters, Oregon, approximately 1443 local time.

The pilot reported that en route to Smith Rock's State Park he encountered light to moderate thermal turbulence and "heard & lightly felt a popping noise in the forward fuselage" and also "lightly felt it in the stick." He then turned toward Kline Falls and "noticed mushy aileron controls" in the turn. The pilot reported entering downwind for runway 27 during which the degradation of aileron and elevator control increased. He reported that shortly thereafter, "something broke (and) left me with a stick that flopped around (&) no control of the aircraft." The pilot then actuated the aircraft's ballistic parachute less than 150 feet above ground. The parachute opened and the aircraft decelerated missing a power pole and coming to rest nearby (refer to photograph 1 which shows the damaged aircraft subsequent to its recovery).

AIRCRAFT INFORMATION

The kitplane, a tandem seat Sportflight Aviation, Inc., Talon XP, serial number 115XP, was purchased and assembled by the pilot/owner and was issued a Special Airworthiness Certificate with an experimental designation on October 18, 1996. The operating limitations for the kitplane were issued on September 18, 1996 (refer to ATTACHMENT OL-I).

Item 6 (page 1 of ATTACHMENT OL-I) states:

"No Person may be carried in this aircraft during flight unless that person is required for the purpose of flight." (Note: this applies to the initial 40 hours of flight operations of the kitplane). Subsequent to the accrual of 40 hours of flight operations, a passenger may be carried in the aircraft so long as the requirements of Item 5 (page 2 of ATTACHMENT OL-I) are met (defined as follows):

"No person may operate this aircraft for carrying persons or property for compensation or hire"

The aircraft had a total of approximately 70 hours of airframe (operating) time when it crashed.

Additionally, the pilot/owner installed a Ballistic Recovery Systems, Inc., ballistic parachute, model BRS-750 "softpack." This system was installed above the aircraft's wing center section, along the longitudinal axis, and was designed to serve as a parachute for both the aircraft and its occupant(s).

WRECKAGE AND IMPACT INFORMATION

Post crash examination of the aircraft was conducted by an Inspector from the Federal Aviation Administration's Hillsboro Flight Standards District Office. The inspector determined that the torque tube which translates fore and aft (elevator movement) and left and right (aileron

movement) from the control sticks, had separated at the forward end of the tube (just forward of the forward torque tube guide) as shown in photograph 2. Further examination revealed that although the forward control stick had been attached to the torque tube, the aft control stick had not been installed. Additionally, the control stick interlink tube had not been installed (refer to photograph 3 and ATTACHMENTS I & II).

TEST AND RESEARCH

Examination of the separation surfaces from the torque tube revealed torsional overload consistent with sideways stick movement associated with aileron inputs. Examination of the assembly drawing for the aircraft's fore and aft control stick assembly (ATTACHMENT II) revealed that both the forward and aft sticks coupled to the fore and aft ends of both the torque tube and the interlink tube to create a "box" unit with structural integrity formed by the four connection points (refer to "Assembled View" insert in ATTACHMENT II). The interlink tube, which rides within the torque tube, extends out through the torque tube radius through a slot cut in the underside of each end of the tube. The fore and aft ends of the interlink tube attach to the respective fore and aft control sticks via bolts (refer to photograph 4).

There was no caution note within the kitplane assembly instructions advising the builder that failure to install either the aft control stick and/or interlink tube would result in a compromise of the structural integrity of the fore and aft stick, torque tube and interlink tube assembly.

ADDITIONAL DATA/INFORMATION

The forward control stick, torque tube and interlink tube, along with associated paperwork for the aircraft, which were shipped to the Safety Board by the FAA Inspector (noted above), were returned to the pilot/owner on February 4, 1998, via certified mail.

Pilot Information

Certificate:	Private	Age:	30, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	05/14/1996
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	148 hours (Total, all aircraft), 116 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	HENDRIX	Registration:	N6291X
Model/Series:	TALON XP TALON XP	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	115XP
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	01/22/1997, AAIP	Certified Max Gross Wt.:	432 lbs
Time Since Last Inspection:	20 Hours	Engines:	1 Reciprocating
Airframe Total Time:	70 Hours	Engine Manufacturer:	Rotax
ELT:	Installed, not activated	Engine Model/Series:	582CDI
Registered Owner:	HENDRIX, ROBERT, A.	Rated Power:	65 hp
Operator:	HENDRIX, ROBERT, A.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	RDM, 3077 ft msl	Distance from Accident Site:	94 Nautical Miles
Observation Time:	1514 PDT	Direction from Accident Site:	5°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 8000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	17° C / -4° C
Precipitation and Obscuration:			
Departure Point:	SISTERS, OR (6K5)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1443 PDT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC): STEVEN A MCCREARY **Report Date:** 07/13/1998

Additional Participating Persons: STEVE SMITH; HILLSBORO, OR

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 pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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