



# National Transportation Safety Board Aviation Accident Final Report

---

<b>Location:</b>	Kalispell, MT	<b>Accident Number:</b>	SEA05LA189
<b>Date &amp; Time:</b>	09/01/2005, 2030 MDT	<b>Registration:</b>	N12QJ
<b>Aircraft:</b>	Ballhagen/Shyrook Q-2	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 None

**Flight Conducted Under:** Part 91: General Aviation - Personal

---

## Analysis

Just prior to the flight, the pilot, who was five hours into a ten hour experimental aircraft flight test regimen, readjusted the valve lash in the Subaru engine that powered the subject aircraft. At the beginning of the flight, he took off and climbed to about 1,000 feet above ground level (agl). After he rolled out on downwind, his ground crew contacted him on the aircraft radio to advise him that the aircraft's engine appeared to have been missing and running rough during the takeoff and initial climbout. About the time that the pilot received the radio transmission, the aircraft's engine quit producing power, and he decided to continue on around the pattern in order to execute a forced landing on the runway from which he had departed. As he turned from base to final, the pilot realized that he might not be able to stretch the glide to the end of the runway, but he elected to attempt to do so. When the aircraft descended to about 25 feet agl, its airspeed slowed to the point where it stall/mushed into the terrain about one-quarter of a mile off the end of the runway. In a post accident inspection, it was determined that the valve clearance in the engine had been set with a gap so small that when the internal engine temperature began to increase the exhaust valves in each cylinder did not completely close. Without the closure of the valves, sufficient compression was not created in the cylinders, and the engine stopped producing power.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot/owner's improper setting of the engine's valve clearance, leading to the failure of the exhaust valves to fully close and a total loss of power while on a VFR downwind, and the pilot/owner's failure to maintain sufficient airspeed as he tried to extend his power-off glide to the approach end of the runway.

## Findings

---

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF  
Phase of Operation: APPROACH - VFR PATTERN - DOWNWIND

### Findings

1. (C) ENGINE ASSEMBLY, VALVE, EXHAUST - OPEN
2. (C) MAINTENANCE, ADJUSTMENT - IMPROPER USE OF - OWNER/PILOT MECHANIC

-----

Occurrence #2: FORCED LANDING  
Phase of Operation: DESCENT - EMERGENCY

-----

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

### Findings

3. STALL/MUSH - INADVERTENT - PILOT IN COMMAND
4. (C) AIRSPEED(VREF) - NOT MAINTAINED - PILOT IN COMMAND
5. TERRAIN CONDITION - GROUND

## Factual Information

On September 1, 2005, approximately 2030 mountain daylight time, an experimental Ballhagen/Shyrook Q-2, N12QJ, impacted the terrain during a no-power forced landing off the end of the runway at Flathead Sky ranch, which is located about five miles southwest of Kalispell, Montana. The private pilot, who was the sole occupant, was not injured, but the aircraft, which is owned and operated by the pilot, sustained substantial damage. The 14 CFR Part 91 personal pleasure flight, which originated at the same airport less than five minutes prior to the accident, was being operated in visual meteorological conditions. No flight plan had been filed. There was no report of an ELT activation.

According to the pilot, who was five hours into a ten hour experimental aircraft flight test regimen, just prior to this flight he had readjusted the valve lash in the Subaru engine that powered the subject aircraft. At the beginning of the flight, he took off on runway 16, and climbed to about 1,000 feet above ground level (agl). After he rolled out on downwind, his ground crew contacted him on the aircraft radio to advise him that the aircraft's engine appeared to have been missing and running rough during the takeoff and initial climbout. About the time that the pilot received the radio transmission, the aircraft's engine quit producing power, and he decided to continue on around the pattern in order to execute a forced landing on the runway from which he had departed. As he turned from base to final, the pilot realized that he might not be able to stretch the glide to the end of the runway, but he elected to attempt to do so. When the aircraft descended to about 25 feet agl, its airspeed slowed to the point where it stall/mushed into the terrain about one-quarter of a mile off the end of the runway. After impacting the terrain, the aircraft slid for about 75 feet before coming to a stop. During the impact with the ground, the front wing (canard) sustained substantial damage.

In a post accident inspection, both the pilot/owner and an FAA Airworthiness Inspector who responded to the scene determined that the valve clearance in the engine had been set with a gap so small that when the internal engine temperature began to increase, the exhaust valves in each cylinder did not completely close. Without the closure of the valves, sufficient compression would not be created in the cylinders, and the engine would stop producing power.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	57, Male
<b>Airplane Rating(s):</b>	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>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 With Waivers/Limitations	<b>Last FAA Medical Exam:</b>	09/01/2004
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	06/01/2005
<b>Flight Time:</b>	1056 hours (Total, all aircraft), 220 hours (Total, this make and model), 1010 hours (Pilot In Command, all aircraft), 20 hours (Last 90 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Ballhagen/Shyroch	<b>Registration:</b>	N12QJ
<b>Model/Series:</b>	Q-2	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental	<b>Serial Number:</b>	A2876
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	02/01/2005, Annual	<b>Certified Max Gross Wt.:</b>	1200 lbs
<b>Time Since Last Inspection:</b>	5 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	300 Hours at time of accident	<b>Engine Manufacturer:</b>	Subaru
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	EA81-1.8L
<b>Registered Owner:</b>	David G. Hudak	<b>Rated Power:</b>	110 hp
<b>Operator:</b>	David G. Hudak	<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:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	340°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	24° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Kalispell, MT (MT95)	Type of Flight Plan Filed:	None
Destination:	(MT95)	Type of Clearance:	None
Departure Time:	2025 MDT	Type of Airspace:	

## Airport Information

Airport:	Flathead Sky Ranch (MT95)	Runway Surface Type:	
Airport Elevation:	3000 ft	Runway Surface Condition:	
Runway Used:	NA	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced Landing

## Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	48.128333, -114.348611

## Administrative Information

Investigator In Charge (IIC):	Orrin K Anderson	Report Date:	02/28/2006
Additional Participating Persons:	Rick Koffman; Helena FSDO		
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:pubinq@ntsb.gov">pubinq@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> .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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](#).