



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

28 November, 2012

AIRFRAME AND ENGINE EXAMINATION

WPR13FA056

N424D – McDaniel, RV-6-CH, AC-3

Field Examination Report

28 November, 2012

Exam Location:

Nu Venture Air Services LLC
Dallas, OR

Participants:

Van McKenny	NTSB
Bob McMahon	FAA
Scott Risan	Vans Aircraft
Richard VanGrunsvan	Vans Aircraft

Accident Location:

City:	Scio, OR
Latitude/Longitude:	N 44 37.750, W 122 52.309
Elevation:	290 ft
Terrain:	Flat, grass pasture

Circumstances/Terrain:

Witness reported observing an airplane making a turn to the north at about 1,000 feet. As it made its turn the wing folded up. The right wing departed the airplane and impacted the center of Hwy 226, the rest of the airplane impacted a pasture 1,000 feet further south. The airplane impacted terrain on its right side. The engine was buried on its right side about 2 feet in to the earth with the left cylinder bank exposed. Both occupants were seatbelted into the airplane.

Examination:

While on-scene a control continuity check was accomplished. The left aileron bellcrank and push rods were traced to the cockpit and the cockpit control stick moved when the aileron was manually deflected. The elevator was manually moved and control

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movement in the cockpit could be seen in concert. Rudder was jammed in place. Rudder cables were traced from the rudder horn to the rudder pedal attach points. Canopy plexiglass fragments, head set, portable GPS, airplane registration documentation were located in a debris field between the resting location of the right wing and the main wreckage.

The airplane was laid out, configured with the left & right wings in their normal positions, cockpit, engine, and tail aligned along the longitudinal axis.

Right Wing:

- Aileron and flap present and attached to their hinge points. Aileron control arm (push tube) connected. Flap appeared to be in the retracted position.
- Wing tip landing light separated from wing.
- Fuel cap present and secure
- Fuel tank breached at wing root.
- Wing root spar bays 1-3 collapsed together along the later axis.
- The main wing spar consisted of 8, 1/8 in aluminum plates stacked in a laminated fashion, with through bolts every 1.25 inches, and 4 v-brace plates placed on each side of the upper and lower spars that joined the left wing and the right wing.
- Wing spar buckled in a double S-shape at the wing root.
- Upper and lower spars (spar caps) of the main wing spar were fractured along the same vertical plane in the vicinity of the wing root. The fracture area was bent forward.
- Black tar or asphalt residue observed on the spar (wing root end), and wing root rib. Pock marks consistent with road surface evident on the fuel tank wing root surface.
- Rear wing spar upper and lower bars bent aft. Doubler plate not present
- Rear wing spar, lower bar, material upper aft portion of the bolt hole not present.
- Rear wing spar, upper and lower spar bars missing 5 rivets each at the wing root.

Left Wing:

- Fuel cap present and secure.
- Aileron and flap on the wing and attached to their respective hinge points.
- Aileron control push rods traced to the cockpit and control continuity established.
- Trim tab present on the aileron.

- The main wing spar was continuous through the fuselage carry through and extending 14 inches past the centerline to the fractured end of the right wing spar.
- Rear wing spar was attached to the rear wing fuselage carry through.

Fuselage/Empennage:

- Cockpit was destroyed, seat pans separated from the fuselage structure.
- Canopy plexiglass was not in place in the canopy frame. The canopy frame had detached from the fuselage.
- Rudder bar/pedals present with rudder cable ends attached.
- Empennage exhibited buckling forward of the vertical and horizontal stabilizers.
- Right horizontal stabilizer and elevator crushed laterally due to ground impact, elevator attached to the stabilizer at hinges.
- Left horizontal stabilizer present, slightly rotated forward on the vertical axis, exhibiting slight buckling at the root leading edge.
- Left elevator and trim tab present on their respective hinges.
- Vertical stabilizer and rudder present. Rudder was attached to its hinges. Rudder could not be moved by hand.

Cockpit:

- Cockpit instrument panel and glare shield was present. The bottom edge of the instrument panel was curled up into the front bottom third of the panel.
- Instruments/controls
 - o Start- both, key in switch
 - o Airspeed – 0
 - o VSI – 0
 - o Altimeter – 7,000 ft, 30.23 inHg
 - o Manifold Pres – 30
 - o Fuel Valve – left tank
- Switches – The backs of all the switches that were located on the horizontal switch panel were sheared off, leaving unreliable switch positions.
 - o Alt Flt – switch not present
 - o Amp Meter – switch not present
 - o Fuel Pump – switch broken
 - o Nav Lts – switch broken
 - o Strobes – switch broken

- o Inst Its – switch broken
- o EFIS – switch broken
- o I/C – switch broken
- o GPS – switch broken
- o Com – switch broken
- o Transponder – switch not present
- o G-meter – needle 0, 2 pointers at -3.8 & -3.0. The reset button was pushed and one pointer moved counter clockwise from the -3.0 to 10.0 position, possibly indicating +12 g recording.

Engine:

- Continental Aircraft Engine, IO-346
- 165 HP
- SN 100511-6-A
- Crack in the right engine case half from the #3 cylinder to the center seam.
- Generator outer case destroyed, armature present on mount
- Oil pan bottom and bottom of engine case torn left and aft from the right side.
- Right exhaust manifold was separated from the cylinders and exhibited plastic deformation. Induction manifold not present. Fuel injector nozzles sheared off of cylinder heads.
- Left exhaust manifold and induction manifold present. Fuel injector nozzles present.
- Throttle body separated from engine block. Butterfly valve open, mud and debris in the throttle body throat.
- Spark plugs (Champion RHM-40E). Top plugs removed. Electrodes were blackish gray, all with similar gaps.
- Right and left magnetos displaced from their mounts.
- Right magneto, Bendix S4RN-205, SN 913618. Rotated by hand, spark produced on 3 leads.
- Left magneto, Bendix S4RN-201, SN 904432. Seized
- Engine was seized and could not be rotated by hand.
- Valve covers removed. All valve, lifters, rockers and springs present, and exhibited a thin oil coat on all parts.
- Fuel distribution valve disassembled. Screws were safety wired, gasket was pliable with no cuts or holes, screen was present with no debris observed, liquid fuel and fuel odor was observed.
- Oil filler cap was in place on the filler tube.

- Oil filter was removed and cut open. The filter element was examined for debris and metal particles. No particles or debris were observed.
- A wood propeller was attached to the propeller flange. One blade was separated at the propeller hub, the other blade extended 20 inches from the hub. Wood fragments from both blades were located with the engine.