



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

SUMMARY OF AIRPLANE EXAMINATION

(WPR12FA432)

This document contains 23 embedded photos.

A. ACCIDENT

Location:	Laramie, Wyoming
Date:	September 21, 2012
Aircraft:	Van's RV-7A
NTSB Investigator-in-Charge	Thomas Little

B. EXAMINATION PARTICIPANTS

Thomas Little
Air Safety Investigator
National Transportation Safety Board
Federal Way, Washington

John Berens
Aviation Safety Inspector
Federal Aviation Administration
Denver, Colorado

Troy Helgeson
Air Safety Investigator
Lycoming Engines
Williamsport, Pennsylvania

C. SUMMARY

On September 21, 2012, about 1445 mountain daylight time, a VANS RV 7A experimental airplane, N423RA, sustained substantial damage after colliding with terrain near the Laramie Regional Airport (LAR), Laramie, Wyoming. The airplane was registered to the pilot. The certified commercial pilot sustained fatal injuries. Visual meteorological conditions prevailed at the time of the accident, and an instrument flight rules (IFR) flight plan had been filed for the cross-country flight, which was being operated in accordance with 14 Code of Federal Regulations (CFR) Part 91. The flight departed the Duluth International Airport (DLH), about 1026 central daylight time, with LAR as the destination.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site Examination

Photographs provided to the NTSB IIC by the inspectors revealed that the airplane had come to rest in an upright position oriented and facing to the southeast, or perpendicular to the extended centerline of Runway 21. While the empennage remained relatively intact aft of the aft cabin bulkhead, all areas forward of the bulkhead were destroyed or had been substantially damaged by impact and thermal damage.

2.0 Airframe Examination

A detailed examination of the airframe subsequent to its recovery to a salvage facility in Greeley, Colorado, which was performed by the NTSB IIC on October 10m 2012, revealed the following:

- A. The airplane's instrument panel was observed and provided the following readings/indications:
- The attitude indicator was uncaged and had tumbled.
 - The airspeed indicator read zero knots.
 - The transponder code read 1400.
 - The fact of the comm/nav radio was observed missing.
 - The mounted switch panel had 10 switches, two of which were observed in the "ON" position, #3 and #4 from the left end of the panel.
 - The oil pressure gauge read zero.
 - The oil temperature gauge read zero.
 - The voltmeter read zero volts.
 - The left fuel gauge read zero
 - The right fuel gauge read zero
 - The reading on the Cylinder Head Temperature was not determined
 - The manifold pressure gauge read zero
 - Hobbs reading – no reading available



Photo 1 instrument panel



Photo 2 instrument panel

B. The airplane's control quadrant was observed and revealed the following:

- throttle control – observed in the full forward position
- propeller control – observed in the full forward position
- mixture control – observed in the full forward position



Photo 3 throttle, propeller and mixture controls

C. Fuel selector

- observed in the Left Tank position

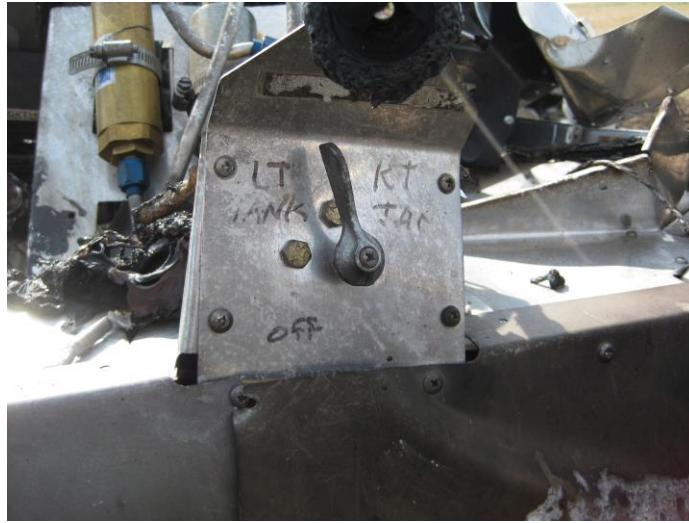


Photo 4 fuel selector

D. Landing gear were observed in the following positions

- Both main landing gear were in their normal extended position and attached to the gear box.
- The nose landing gear remained attached to its fuselage attached point and was bent aft



Photo 5 main landing gear



Photo 6 nose landing gear

E. Right wing

- the wing was observed separated from its fuselage attach points
- the aileron remained attached at all attach points
- the flap remained attached at all attach points. Flap position not determined.
- the wing fuel tank was destroyed by impact and thermal damage
- the outboard one-half of the wing's leading edge sustained aft crushing, consistent with the initial impact with terrain.
- the inboard one-half of the wing was destroyed back to the forward spar
- torque tube and cable continuity was established to the aileron and flaps from the wing root area.
- the entire span of the wing had sustained thermal damage.



Photo 7 right wing

F. Left wing

- the wing was observed to have remained partially attached to the airplane's fuselage at its forward attach point.
- the aileron remained attached to the wing's trailing edge at all attach points.
- the entire span of the wing's flap was observed bent under the bottom of the wing. Unable to determine flap position due to destructive impact forces to component.
- control continuity to the associated flap and aileron could not be determined due to the impact and thermal destruction of the wing.
- the wing's fuel tank was destroyed.
- the general condition of the wing was observed to have been bent, twisted, mangled, having sustained severe thermal and impact damage.



Photo 8 left wing

G. Center fuselage

- both control sticks were observed intact and connected to each other via the respective torque tube.



Photo 9 center fuselage (control sticks)

H. Empennage

- the empennage was observed separated from the main cabin just forward (about 18 inches) of the aft cabin bulkhead.
- both sides of the fuselage aft of the aft cabin bulkhead were observed compressed inward.

- the horizontal stabilizers, vertical stabilizer, rudder, and both elevators remained attached to the aft fuselage at all attach points.
- no damage was observed to the vertical stabilizer.
- no damage was observed to the rudder.
- the left elevator had sustained a slight crease to its outboard section.
- the right elevator has sustained a slight crease to its outboard section.
- control cable continuity was confirmed from the elevator, rudder and left elevator trim tab up to the aft cabin bulkhead. Cable separation forward from the aft cabin bulkhead area to the forward cabin area was consistent with overload.



Photo 10 empennage



Photo 11 empennage

3.0 Engine Examination

A detailed examination of the airplane's engine conducted by a Lycoming field representative and overseen by the NTSB IIC, revealed the following as reported by the Lycoming rep:

The engine was examined on October 10, 2012 at the facilities of Beegles Aircraft Services, Greeley, Colorado.

The engine remained attached to the firewall but separated from the fuselage. The propeller and propeller flange was broken free from the crankshaft. The separation was consistent with torsional overload. Both propeller blades were relatively straight and exhibited chordwise scratching and polishing, and minor leading edge damage. One blade was twisted slightly.



Photo 12 engine



Photo 13 engine



Photo 14 crankshaft separation



Photo 15 propeller

examination. The oil sump was broken apart and the engine data plate was missing. The engine serial number stamped on the case was noted as L-930-55. The logbook showed the serial number as L-1106-55. There was also no maintenance entries recorded in the engine logbook.

The rear accessories, valve covers, and top sparkplugs were removed to facilitate the engine exam. The cylinders were borescope inspected and no anomalies noted. The crankshaft was rotated via the vacuum pump drive, and thumb compression was established on all cylinders. Engine drive train continuity was established throughout. The spark plugs appeared normal as compared to the Champion Aviation Check a Plug Chart AV-27.



Photo 16 engine rotation confirmed



Photo 17 spark plugs

The right magneto was rotated by hand and produced spark at all leads. The left magneto did not produce spark when rotated by hand. Disassembly of the left magneto revealed that a rubber insulator had melted due to the post impact fire and was causing a short to the magneto coil.



Photo 18 right magneto



Photo 19 left magneto

The fuel servo was found broken free from the oil sump. The servo's brass plug was found safety-tied and tight, and the inlet screen was found free of debris.



Photo 20 fuel servo



Photo 21 fuel servo inlet screen

The engine oil filter was examined and found free of contaminants. The engine driven fuel pump was found broken free from its mounting flange.



Photo 22 engine oil filter

The fuel flow divider cover was removed and the diaphragm was found destroyed by heat and the center plunger was frozen in place. The fuel injectors were all found free of any blockages.



Photo 23 flow divider

No evidence was found of a catastrophic in-flight engine failure.