



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

September 14, 2022

EXAMINATION SUMMARY

ERA22LA213

A. ACCIDENT

Location: Huntsville, Alabama
Date: May 1, 2022
Time: 1705 CDT
Airplane: N1218B, RV7A

B. INVESTIGATION PARTICIPANTS

Lynn Spencer - IIC
Eastern Region Aviation (ERA)
National Transportation Safety Board
Ashburn, VA

James Childers
Air Safety Investigator
Lycoming Engines
Williamsport, PA

C. SUMMARY

On May 1, 2022, about 1705 central daylight time, an experimental amateur-built Van's Aircraft RV-7A, N1218B, was substantially damaged when it was involved in an accident near Huntsville, Alabama. The pilot was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Review of preliminary Federal Aviation Administration (FAA) flight track data revealed that the airplane was first detected at 1328 shortly after departing McKinney National Airport (TKI), Dallas, Texas. The airplane climbed to an altitude of about 10,500 ft mean sea level and continued on an easterly course for about 2 hours and 48 minutes before the altitude, heading, and groundspeed began large deviations. The airplane circled right and left east of Huntsville for about 30 minutes before flying a low approach over runway 9 at Moontown Airport (3M5), Huntsville, Alabama. The airplane then made a left 180° turn and flew west about 8 miles before it turned back and descended again toward 3M5. The airplane impacted terrain about 200 yards short of runway 9 and came to rest inverted.

The wreckage was recovered to AMF, Springfield, TN, where the examination took place on September 1, 2022. Recovery personnel stated that fuel was draining from the fuel fitting at the firewall when they removed the engine for recovery.



Photo 1- Wreckage laid out for examination

1.0 Airframe

Maintenance

No logbooks were recovered or made available.

Airframe Examination

Airframe

The fuselage was intact, and the canopy was in the closed and latched position; however, the plastic canopy was fractured with the pieces in a nearby wreckage bag. The left wing had been cut just outboard of the wing fuel tank for recovery and the flap was still attached. The outer section of the left wing with aileron attached displayed impact damage from the leading edge aft

at its outermost 3 feet. The right wing with flap and aileron attached was intact and the outermost 3 feet of the leading edge was impact damaged. The flap was impact displaced forward and downward.

The fuselage and empennage had been separated for recovery. The fuselage and cockpit were intact except for the canopy plastic. The empennage was intact with the rudder attached to the vertical stabilizer and the elevators attached to the horizontal stabilizers. The top portion of the vertical stabilizer and rudder were impact damaged.

Flight Control System

Flight control cable continuity was established from the cockpit through numerous recovery cable and tube cuts to the aileron, elevator and rudder control surfaces.

The flap position was undetermined; however, the left flap was in the UP position.

Airframe Fuel System

There was no fuel present in the left or right wing fuel tanks. The fuel selector handle was in the OFF position. The firewall fuel line fitting to the cockpit fuel selector dripped a liquid consistent with fuel.

Seats and Seatbelts

The right seat had been removed and the seat base was detached from the back, and the left seat was intact and attached to the fuselage. There was a 5-pt harness and seat belt for the left seat. The left and right lap belts were still connected to the center locking mechanism, and the right lap belt had been cut. The left and right shoulder harnesses were found attached to their attachment points in the empennage through cable cuts for recovery. The shoulder harness webbing and attachment latches appeared undamaged. The shoulder harness straps for the left seat were not attached to the center locking mechanism.

Instrument Panel/Cockpit Controls/Switches

The instrument panel was intact and undamaged with most instruments removed at recovery and available for inspection. The cockpit was observed and photographed. The Master Switch, Fuel Pump, Taxi light, Pitot Heat, and Defrost Fan switches were in the OFF positions, and the Standby battery, AVI Master, Nav Lights, Strobe lights and Autopilot were in the ON positions. The throttle, mixture and propeller controls knobs were in their full IN positions. The carburetor heat was in the OFF position.

Airframe Examination Photos



Photo 2 - Right Wing



Photo 3 - Left wing cut for recovery



Photo 4 - Outboard section of left wing with aileron attached



Photo 5 - Empennage with elevators and rudder intact



Photo 6 - Left pilot seat with lap belts attached to locking mechanism

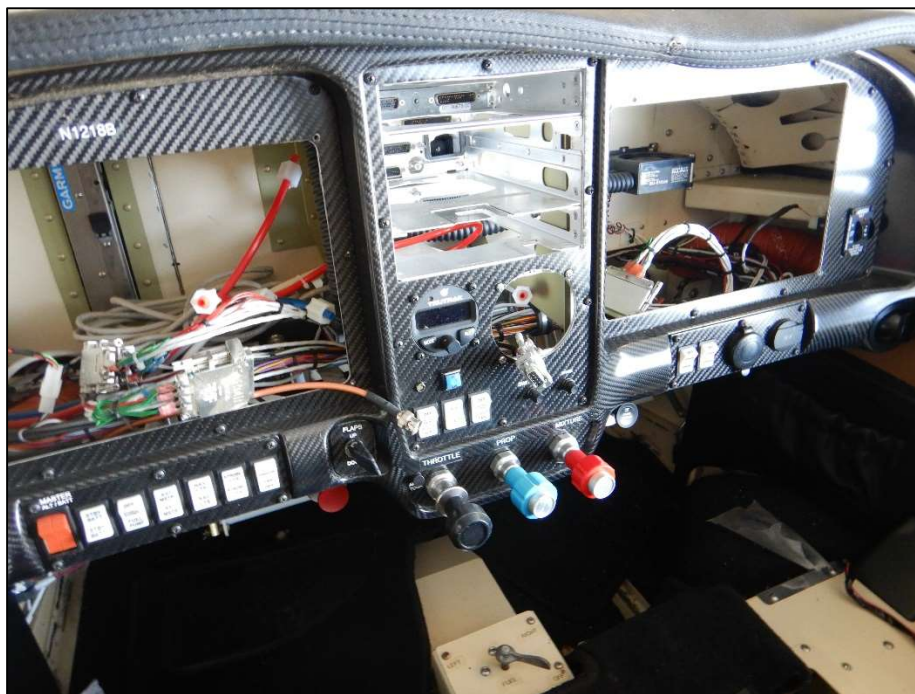


Photo 7 - Control panel and fuel selector with avionics removed

2.0 Engine

The airplane was equipped with a 4-cylinder Teledyne Mattituck Services TMXIO-390 engine, serial number V53944305, fitted with a Hartzell 2-bladed propeller. Engine maintenance logbooks were not provided. As first viewed, the engine was in a bag the recovery facility. The propeller remained attached to the engine crankshaft flange. The engine mount tubes had been cut by recovery personnel. The engine was suspended from a lift and partially disassembled to facilitate the examination. The engine data plate identified the engine as a “TMX Experimental Aircraft Engine” manufactured by Teledyne Mattituck Services.

The rocker covers were removed, and the top and bottom spark plugs were removed. The upper and lower spark plugs were worn normal condition. The engine crankshaft was rotated by turning the propeller and continuity of the crankshaft to the rear gears and to the valve train confirmed. Compression and suction were observed from all cylinders. The interiors of the cylinders were observed using a lighted borescope with no anomalies noted.

The fuel injector servo was removed with no damage noted. The throttle control arm remained attached and was in the full throttle position. The mixture arm remained attached and was in the full rich position. A few drops of liquid consistent with fuel were present when the servo was turned upside down. The diaphragms were undamaged, and the fuel inlet screen was unobstructed. The fuel flow divider remained attached to the engine with no damage noted. The fuel injector lines remained securely attached. It was partially disassembled with no damage noted to the rubber diaphragm. There was no fuel noted. The engine driven fuel pump was removed with no fuel noted. The fuel pump produced air at the outlet port when actuated by hand. It was partially disassembled with no damage to the rubber diaphragms or internal check valves and no fuel noted. Fuel injector nozzles were unobstructed. The left magneto remained attached to the engine and was removed. Sparks were produced on all leads when the magneto was rotated by hand. The right side ignition was electronic and was not tested; the upper high tension contacts for each coil were broken off. No fuel was noted in any fuel lines forward of the firewall. The oil suction screen was absent of debris. The oil filter was cut open and was absent of debris.

The starter remained attached to the engine and was impact damaged. The alternator remained attached to the engine and was not removed. The alternator belt remained in place and unbroken.

Oil was observed in the engine. The oil suction screen and the oil filter media were absent of debris.

Engine Photos



Photo 8 - Engine and propeller before examination

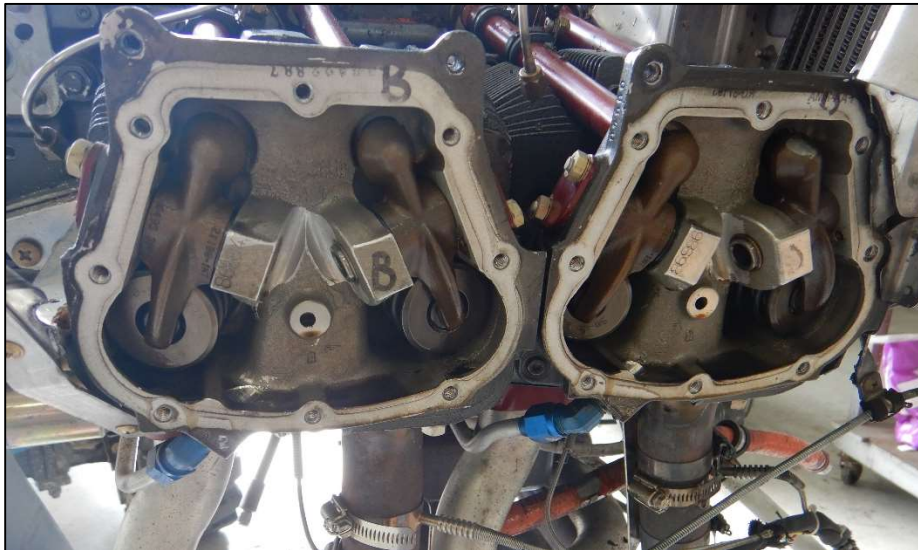


Photo 9 - Cylinders B and D with rocker covers removed



Photo 10 - Cylinders C and A with rocker covers removed



Photo 11 - Spark plugs



Photo 12 - Magneto

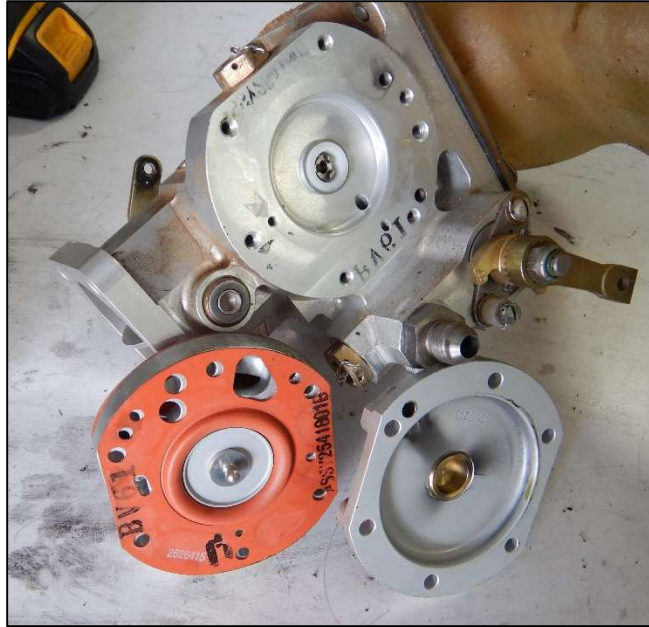


Photo 13 - Disassembled fuel selector servo

3.0 Propellers

The propeller remained attached to the engine crankshaft flange. The propeller spinner was impact fragmented. Both propeller blades were curved aft about 10 degrees at about mid-span and exhibited chord-wise scratches and leading edge gouges.

The propeller governor remained attached to the engine and no damage was noted. The propeller cable remained attached to the governor control arm and the arm was positioned to the full increase RPM position. The cockpit propeller control knob was positioned fully forward. The governor was removed and the driven spline rotated freely by hand. The governor oil screen was absent of debris.

- Blade 1 – Aft bend; leading edge gouging and chordwise abrasion
- Blade 2 – Aft bend; leading edge gouging and chordwise abrasion

Propeller Photos



Photo 14 - Propeller blade 1



Photo 15 - Propeller blade 2



Photo 16 - Close-up view of leading edge gouging on blade 1