NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SUMMARY OF ENGINE/AIRFRAME EXAMINATION

-- CEN21LA273 --

A. ACCIDENT

Location: Fort Worth, Texas
Aircraft: N878TD, Vans RV10

B. PARTICIPANTS

Craig Hatch
Aerospace Engineer
National Transportation Safety Board
Denver, Colorado

C. DETAILS OF ENGINE EXAMINATION

A post-recovery engine examination was conducted at Air Salvage of Dallas, Lancaster, Texas, on July 7, 2021. The airplane wings and empennage had been partially disassembled for transport. The engine mount was broken and an engine run was not attempted. The fuselage was placed on stands for the examination.

D. SUMMARY OF ENGINE EXAMINATION

Engine – Lycoming O-540 A1D5, an aftermarket fuel injection unit and Lightspeed ignition system had been installed.

Engine

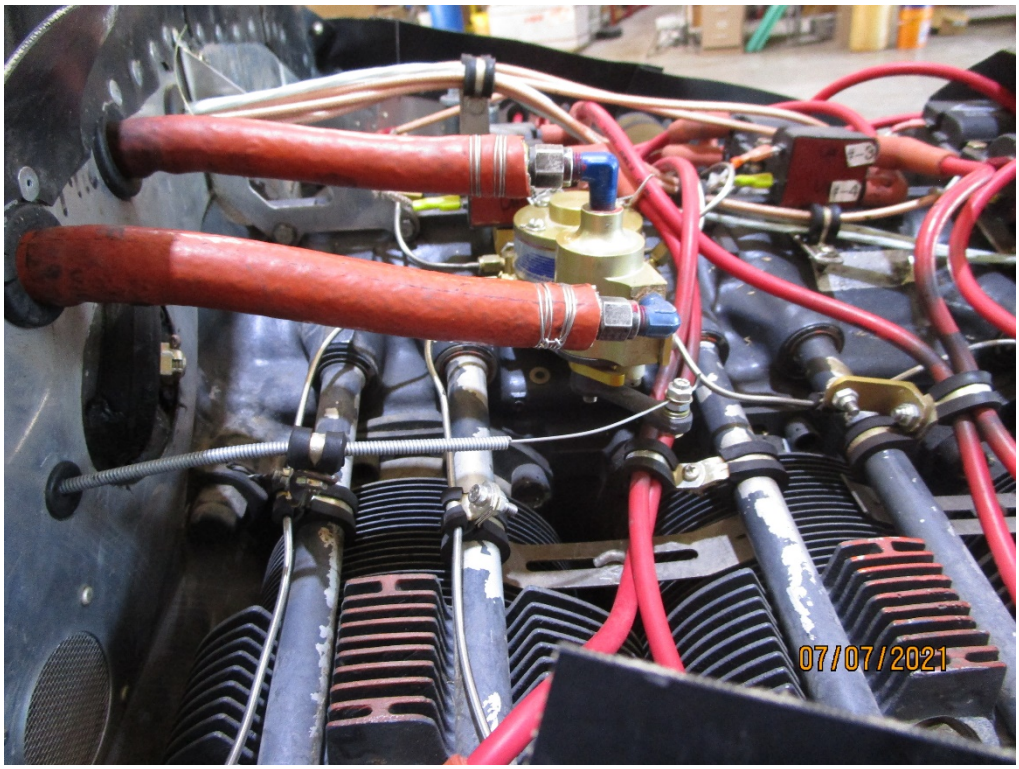
- Engine remained attached to the airframe, but the airframe and engine mounts were broken.
- Propeller remained attached to the crankshaft flange and the propeller.
- One blade tip had damage, the other blade was curved back toward the non-camber side, about mid-span, and the small portion of the blade tip appeared to be missing.

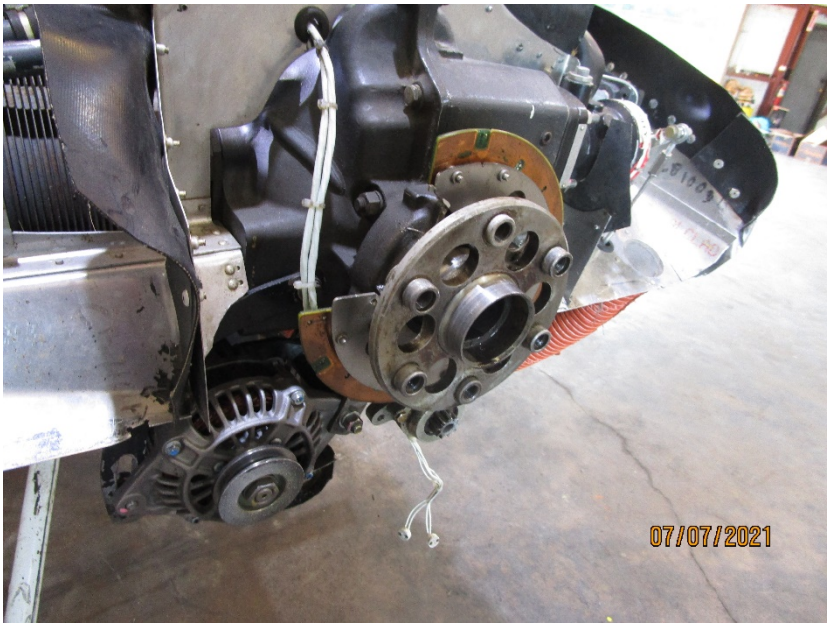
- Removed top and bottom set of (automotive style) sparkplugs, top right appeared normal. Top left appeared dark, both sets of bottom plugs appeared wet and black.
- Valve covers were removed, inside of each cover were rusted.

Each valve cover had similar appearance

- Oil breather line was not connected, rust was observed in breather.
- Auxiliary alternator (rear accessory pad) was removed. The engine was rotated by using a spline drive inserted into accessory pad. Rotation thru valve train, accessories, and to the crankshaft was observed.

- Both PFD and MFD SD cards were absent.
- Fuel injection; mounting of “Bowden” style cable is noted





- Crankshaft flange and crankshaft position sensor
- Magnet was used to trigger ignition system, first attempt did not produce any sparks, subsequent attempts were able to produce spark on one set of ignition.
- Labeling of ignition wires and coil packs didn't always correspond, nor correspond to the cylinder it was associated with. (firing order of ignition vs engine firing order ?)
- Ignition control boxes located behind firewall, above rudder pedals (difficult/limited access)
- Angle grinder was used to cut fuselage skin, (just behind firewall, and in front of windscreen) to allow access to ignition boxes.
- (output) pin connector to box #1 not connected, other pin connector were observed not fully secured to ignition boxes.

---------- *end of summary* ----------