



RECORD OF EXAMINATION

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**Participants: Ramon Grillo; FAA Coordinator; Grand Rapids FSDO
Jordan Paskevich; Rotech Flight Safety – Rotax Aircraft Engines**

NTSB Accident Number: CEN16LA363

Narrative:

Post-accident examination of the airplane and an engine run were performed at the pilot's hangar by a representative from the engine manufacturer and by the Federal Aviation Administration Coordinator for the accident. The engine was a Rotax 582 MOD 99, serial number 543 7309.

The examination revealed that all the spark plugs were NGK BR8ES that had removable resistor caps, which was not in accordance with the engine manufacturer's maintenance manual. The spark plug gaps were 0.29 - 0.30 inch (the engine maintenance manual specifies a gap size of 0.018 - 0.021 inch). All the spark plugs' electrodes exhibited a color consistent with a rich fuel mixture. The number 4-cylinder spark plug on the magneto side of the engine was loose and did not meet the torque specification in accordance with the engine manufacturer's maintenance manual.

The power takeoff and magneto sides of the engine had both carburetors equipped with larger main jets, which were 190 size jets instead of the engine manufacturer's original equipment, which were 160 size jets (higher jet numbers equate to a richer mixtures). Both carburetor chokes were blocked off and removed from service. Both jet needles clip positions were in the number 4 position and not in the number 3 position, as specified in the engine manufacturer's maintenance manual.

There were no fuel filters installed between the fuel pumps and carburetors as specified in the engine manufacturer's maintenance manual. The pneumatic fuel pump was found installed on the engine with the small drain hole near the impulse connection, positioned horizontally. The engine manufacturer's maintenance manual states that "The fuel pump should be installed in a

cool place (not on the engine itself), with the small drain hole near the impulse connection towards the bottom. This hole drains oil condensate from the pump diaphragm chamber".

The gascolator was installed with industrial style (non-aircraft) brass plumbing fittings and an industrial style (non-aircraft) shut-off valve. Plumbers thread seal tape was present on the threads of the fuel line fittings. There was no fire sleeve on any of the fuel lines.

The fuel header tank was a white plastic container that was consistent with a water jug. The threaded cap of the header tank had a fuel system quick release type connector attached with a pick-up tube that extended to the bottom of the container. When the quick release type connector was tested, it leaked a substantial amount of air into the fuel system.

The engine manufacturer's maintenance manual stated: "Quick release type connectors can cause air leaks and produce fuel flow restrictions and possible blockage sites" "the tiniest flaw in any joint will cause air to be sucked into the fuel system, considerably reducing the capacity of the fuel pump. Air leaks are much more dangerous when the fuel tank is mounted below the fuel pump and carburetors"

The engine was run for several minutes with multiple throttle inputs during which no anomalies in engine power occurred.

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