

Inspector's Report for Aircraft N42VZ Accident Damage – 11/07/2023, Guntly Field, Franksville, WI

In November 2023 I was requested to assist in an aircraft occurrence investigation conducted by the Milwaukee Flight Standards District Office involving aircraft N42VZ, a single engine two seat Model TVAP-4 aircraft in the Experimental – Amateur Built category. This aircraft sustained an engine failure after takeoff and the resultant forced landing resulted in impact damage to the aircraft. The solo pilot reported that the engine stopped suddenly and completely shortly after takeoff, about 200 feet above ground and ¼ mile beyond the airport runway. The pilot continued the heading and landed in an open field north of the airport. Damage was incurred when the main landing gear sunk into the turf on landing rollout and the aircraft flipped over, coming to rest inverted. The pilot reported no injuries.

On November 7, 2023, I inspected N42VZ at the owner's hangar at Guntly Memorial Field, Franksville, WI. The aircraft was situated in the hangar upright and intact. The aircraft owner/pilot was present and offered assistance for the duration of my inspection. Impact damage was noted to the propeller, engine cowling, engine lower firewall, wings, and nose landing gear. The right wing leading edge was noted to be displaced 1-1/2" lower than the nominal attachment to the fuselage, and the aft wing skins exhibited buckling at the inboard end. The left wing inboard lower skin exhibited buckling and wrinkling at the wing root area.

Fuel presence was confirmed in the left and right main wing tanks (each 2/3 full) and at the engine fuel manifold. The engine compartment was intact, engine oil quantity was normal, and engine controls continuity was established. The flight controls continuity and electrical system operation were normal. The model and serial numbers of the engine and left and right magnetos could not be determined, nor Airworthiness Directives applicability, due to the removal of identification plates indicative of the experimental status of these components.

The aircraft owner stated that he bought this aircraft on 3/15/2023 with approximately 60 hours total time. Records indicated that the most recent condition inspection was accomplished on 2/22/2023. According to the aircraft owner, no previous maintenance records were provided by the seller of this aircraft.

The Electronic Flight Information System (EFIS) and Engine Display (EDM) components were removed for evaluation of operational and flight data memory. FAA chain of custody forms were initiated and signed by the aircraft owner for these units.

On 11/09/2023 I returned to continue the engine inspection of N42VZ. Internal engine continuity was confirmed with thumb compression checks. The removed spark plugs and ignition leads appeared normal. Noteworthy was the installation of an automotive supplemental ignition system (details listed below) consisting of an ignition amplifier and an ignition interface unit. In researching this add-on ignition control system, the following statement was found in the system installation instructions: *NOTE: In flight loss of engine power or suspected G3i ignition system failure, Toggle off the power to the G3i ignition system to revert back to default magneto mode.*

When queried, the pilot stated that he was unaware of this notice, since no aircraft build records were provided to him as the buyer of this aircraft.

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Subsequent functional testing of the standard engine ignition system operation was confirmed to be normal by presence of ignition spark with electrical power and magnetos in the ON positions, and the supplemental system switched OFF. However, with the supplemental ignition switched ON, no spark was noted. This was confirmed through repetitive tests. Further inspection revealed that the electrical fuse for the supplemental ignition control was blown, and the ground wire connection to the left magneto was loose within the crimped sleeve of the terminal end.

These findings were coordinated with the aircraft owner and the NTSB inspector assigned to this occurrence. It was determined that the previously identified flight and engine system displays would not be evaluated further, due to confirmed failure of the engine ignition system. On 12/19/2023 these units were returned to the aircraft owner.

The supplemental ignition system component details were recorded for possible evaluation and testing:

MSD Ignition Multiple Spark Discharge (Ignition Amplifier)

Manufacturer: Autotronic Controls Corporation TX

Model: MSD 6A / Part No. 6200 Serial no. 608602

G3i Ignition Interface

Manufacturer: Generation 3 Ignition, Englewood, CO 80110

no model or serial no. information found

Website listed on identification plate: WWW.G3IGNITION.COM

Phone number listed on identification plate: [REDACTED]

Conclusion: it was determined that the engine stoppage was likely caused by ignition system failure, due to inflight failure of the supplemental ignition system installed by the aircraft builder. This failure mode was replicated numerous times during ground testing of the electronic ignition control system.

Sincerely,

[REDACTED]

Michael Brockel
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