



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

November 21, 2019

Examination/Accident Summary

WPR19LA218

This document contains 4 embedded photos.

1.0 EXAMINATION PARTICIPANTS:

Dennis Hogenson
S-ASI
NTSB
Federal Way, WA 98003

Yasmin Duran
ASI
FAA - FSDO
Scottsdale, AZ 85255

Mark Platt
ASI
Lycoming
Williamsport, PA 17701

Pete Kelley
ASI PMI
FAA – FSDO
Scottsdale, AZ 85255

Andrew Swick
ASI
NTSB
Gilbert, AZ

2.0 SUMMARY

On August 14, 2019, about 0725 mountain standard time, an Extra Flugzeugbau 300 L airplane, N19AM, impacted terrain subsequent to a loss of engine power near Mesa, Arizona. The flight instructor and pilot receiving instruction were not injured, and the airplane sustained substantial damage. The airplane was operated by Aviation Performance Solutions, LLC, as a Title 14 *Code of Federal Regulations* Part 91 instructional flight. Day visual meteorological conditions prevailed at the time of the accident, and a company flight plan was filed. The local flight departed Phoenix-Mesa Gateway Airport (KIWA), Mesa, about 0625.

A representative of the operator reported that while the airplane was maneuvering in a designated practice area, the engine lost power. After multiple unsuccessful attempts to restore engine power, the pilot maneuvered the airplane to an open field and landed off-airport.

Airplane Information

The Extra 300L is manufactured in Germany by Extra Flugzeugproduktions. The 2-place single engine airplane, certified in Normal and Acrobatic category, is powered by a Textron Lycoming AEIO-540 series engine rated at 300 HP. The engine is fitted with a three-blade adjustable pitch MT-Propeller.

The accident airplane, serial 046, was manufactured in 1997. The airframe total time at accident was approximately 3,231 hours; the engine (serial L-26069-48A L-26069-48A) time total time was 1,336 hours.

3.0 FAA ON SITE SUMMARY

The onsite wreckage examination was conducted by inspectors from the FAA Scottsdale FSDO on August 14, 2019.

The airplane landed on rough, uneven desert terrain overlaid with heavy brush like vegetation. The airplane sustained impact related damage to the propeller, wing assembly and the landing gear was collapsed. The right main landing gear leg fractured near the fuselage attachment point and was imbedded in the right wing, near the wing root.

The three-blade adjustable pitch wooden propeller remained attached to the crankshaft flange. The spinner assembly was in place, secure and no damage was noted. Two consecutive propeller blades were fractured midspan and the third was fractured near the propeller tip. The fractures were consistent with rotational torque at the time of impact.

The main wing assembly sustained impact damage; however, the wing fuel tanks were intact and there was no evidence of fuel escape. The wing fuel tank filler caps were secure and in place. The Acro/center fuel tank filler cap was secure, in place, and there was no evidence of fuel escape from the center tank assembly.

Postaccident, the Acro/center fuel tank contained approximately 13 gallons of Avgas. The left tank contained trace amounts of Avgas and the right tank contained approximately 6 gallons of Avgas.

Subsequent to the onsite examination, the airframe was partially disassembled, and the wings were removed to facilitate transportation and storage. Later that evening, the wreckage was moved to Air Transport, Phoenix, AZ.



Figure 1 Wreckage at Accident Site – Source FAA

4.0 POSTACCIDENT AIRFRAME/ENGINE EXAMINATION

The exam of the recovered airframe, engine and propeller assembly began November 21 at the facilities of Air Transport, Phoenix, AZ.

The wreckage was moved from secure storage and positioned in a work area to facilitate the exams and functional testing of the engine.

Preliminary examination of the airframe and engine showed negligible damage to the forward section of the fuselage and engine bay, however, the three-blade propeller showed extensive impact related damage. The propeller assembly and engine cowling were removed to facilitate the exam.

The exam revealed that the engine remained attached to the firewall and the engine mounts were in place, secure with nominal damage noted. There was no evidence of a catastrophic engine event, crankcase damage or excessive oil escape. All six cylinders were in place, secure and no external damage was noted to the accompanying valve assemblies or covers. The magnetos were in place and secured to their respective accessory mounting pads. The associated ignition harnesses appeared undamaged, appropriately routed and secured to their respective spark plugs. The spark plugs were secure at each position with their respective spark plug lead attached.

The magneto timing was evaluated and determined to be 25 degrees below TDC (No. 1 cylinder) for the left magneto and 24 degrees below TDC (No. 1 cylinder) for the right magneto.



Figure 2: Recovered Wreckage -NTSB

Engine control cable continuity was confirmed from the propeller, mixture, and throttle control cables to their respective control arms. Impact related damage was noted to the distal end of the throttle control cable; however, continuity was confirmed, and the cable actuated the servo throttle control arm from stop-to-stop.

The fuel delivery system was intact, and the fuel lines appeared to be properly routed from the cockpit fuel selector valve to the gascolator, electric boost pump, mechanical fuel pump, fuel injection servo to the fuel flow manifold. The fuel lines were secure and there was no evidence of fuel escape or damage to the fuel lines.

Impact related damage was noted to the forward section of the fuel injection servo, and organic debris was observed in the air inlet venturi. Damage was noted to one of the impact tubes. The throttle valve was intact and undamaged. The idle valve lever and mixture control arms were in place, secured and actuated stop-to-stop without restriction. The associated fuel supply line was in place, secured and undamaged.

Rocker arm, valve train and accessory gear continuity was established by rotating the engine's crankshaft by hand. All six cylinders developed pressure when the crankshaft was manually rotated. Internal examination of the piston cylinders, utilizing a lighted bore scope, revealed no evidence of a mechanical damage or FOD. The Spark plugs were removed; the electrodes were intact, and no mechanical damage was noted. The spark plug electrodes displayed coloration consistent with normal operation.



Figure 3: Postaccident – Starboard Side View of the Engine - NTSB



Figure 4: Postaccident – Port Side View of the Engine - NTSB

In preparation to functionally test the engine, an external fuel source (gravity feed) was plumbed directly to the airframe fuel selector valve. An intermittent fuel leak, originating from the back side of the selector valve, was noted; the leak was intermittent and arbitrary. The selector valve was retained for further examination.

Additionally, the damaged propeller was removed, and a segregate 2-blade propeller was installed.

Multiple attempts to start the engine to a sustained idle power setting were unsuccessful and it was determined that the engine was likely not receiving adequate fuel. After troubleshooting the fuel system, it was determined that the electric boost pump was not delivering rated fuel flow (40 GPH @ 26 psi). The electric boost pump was removed and replaced with a segregate boost pump. In addition, the fuel injection servo was removed and replaced with a segregate unit.

The segregate boost pump was functionally tested and appeared to deliver sufficient fuel (volume and pressure) to the engine.

After securing the fuel system and verifying continuity, the engine was started utilizing the electric boost pump (per OEM guidelines). The engine started and developed continuous power at varied throttle positions between idle to full power. Once started, the electric boost pump was switched to the off position; the engine continued to run at varied throttle positions and no anomalies were noted. The engine power was decreased to idle power and the engine was shutdown. No further anomalies were noted.

The fuel injection servo, fuel selector and electric boost pump were retained for further testing.

END – DJH