



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

April 29, 2021

ENGINE EXAMINATION SUMMARY REPORT

WPR20LA258

This document contains 20 embedded photos.

A. ACCIDENT

Location: Hanna, Utah
Date: August 7, 2020
Aircraft: N761RG
NTSB IIC: Andrew Swick

Preliminary Report:

On August 7, 2020, about 1145 mountain daylight time, a Cessna T210M airplane, N761RG, was substantially damaged when it was involved in an accident near Hanna, Utah. The private pilot and one passenger had serious injuries and 4 other passengers had minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations Part 91* personal flight.

The pilot reported that the airplane had a loss of power during a turn over mountainous terrain. The pilot decided to fly down canyon as the propeller continued to windmill. He initiated a forced landing in an open field where the airplane experienced a hard landing. The open field is on the banks of Moon Lake at an elevation of 8,100 ft mean sea level (msl). The airplane's forward fuselage and cabin area were crushed upwards and the engine was partially separated from the airplane. Both wings were buckled near the tips.

Preliminary flight track data shows the airplane as it departed Roosevelt Municipal Airport (74V), Roosevelt, UT, and climbed northwest over mountainous terrain. The track turns to the west and continues to climb to an altitude of 12,927 ft msl. The track then decreases in altitude as it turns southwest approaching a large canyon. Shortly after the flight track data stops at 11,575 ft msl. At this point the accident site is south downcanyon, at about 7-1/2 miles.

The wreckage was recovered to a secure location for further examination.

B. PARTICIPANTS

Andrew Swick
Aviation Accident Investigator-IIC
National Transportation Safety Board
Phoenix, Arizona

C. SUMMARY

Examination of the airframe and engine was conducted at Air Transport in Phoenix, Arizona on April 29, 2021. The examination of the engine revealed no evidence of preaccident mechanical malfunctions or anomalies that would have precluded normal operation.

D. Engine Examination

The engine was removed from the crate and hoisted with a forklift. The turbocharger, wastegate and sections of exhaust piping were removed from the engine for shipment. The exhaust assembly and various hoses were also found in the crate and were damaged.

The engine oil sump had impact damage and was breached near the oil drain port. The exhaust assembly was cut from the right side cylinder stacks during the preparation for shipment. The exhaust muffler was crushed and remained attached to the left side cylinders. Various lines and tubing had impact damage and were cut during the removal from the airframe and the removal from the turbocharger. The magnetos and ignition leads were undamaged and secured. The accessory section was undamaged and all accessories remained attached. The crankcase backbone area and oil filler neck were covered in an oil and dirt residue.



Figure 1-Engine and crate.

The baffling assembly was removed from the engine. The cylinder rocker covers were removed and the overhead components were covered in a clear residual oil. The cylinders were undamaged.



Figure 2-Left cylinder's overhead components.



Figure 3-Right cylinder's overhead components.

The upper sparkplugs were removed and displayed in a rack. The sparkplugs had a normal amount of combustion deposits and the electrodes had normal wear. The No. 2, 4 and 6 electrode areas had a light residue of oil.



Figure 4-Upper sparkplugs.

The crankshaft was rotated by hand and rotational continuity was attained to the accessory section and cylinder overheads. Cylinder compression and normal valve movement was observed.

The cylinders were boroscoped and all cylinder combustion chambers had normal operating signatures. The amount of combustion deposits was minimal.

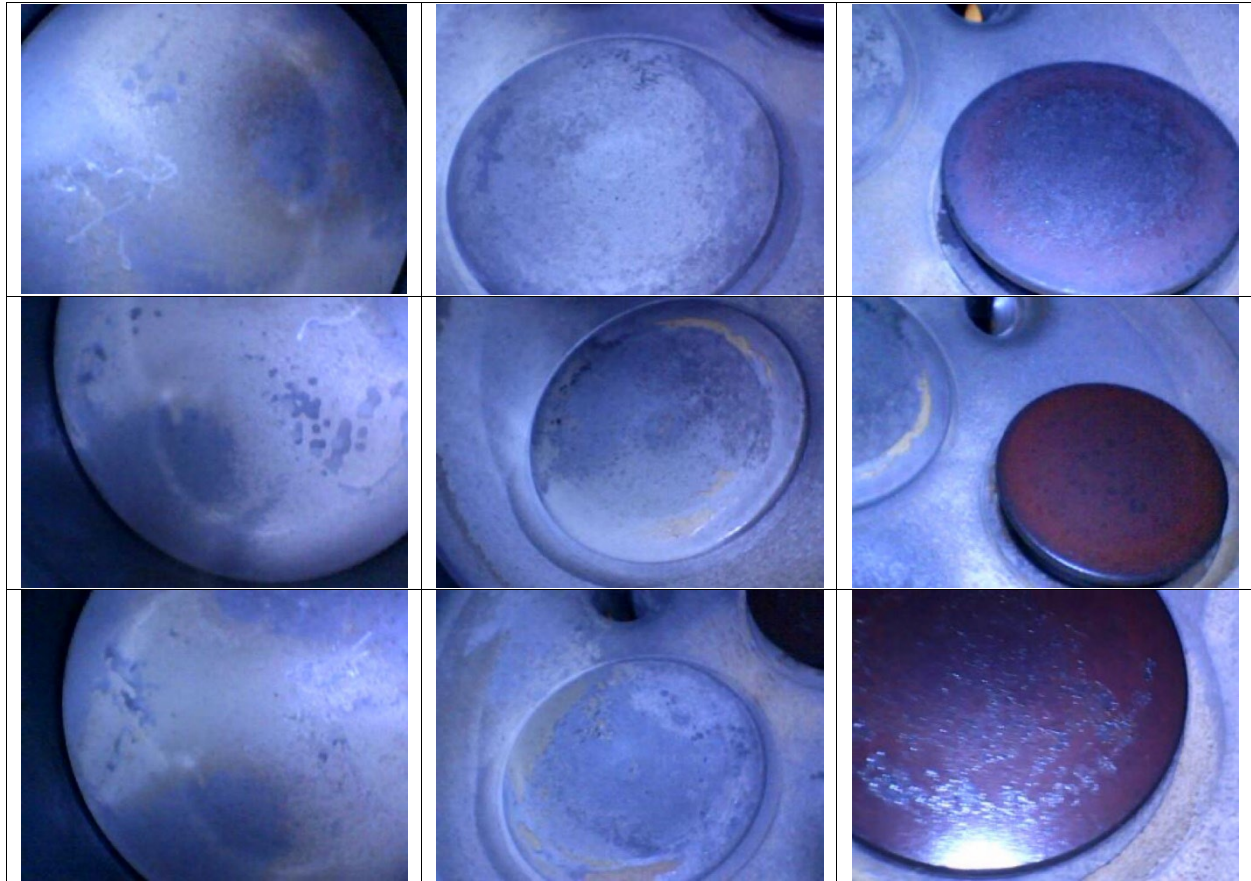


Figure 5-Cylinder Nos. 1, 3 and 5 piston domes and valve heads.

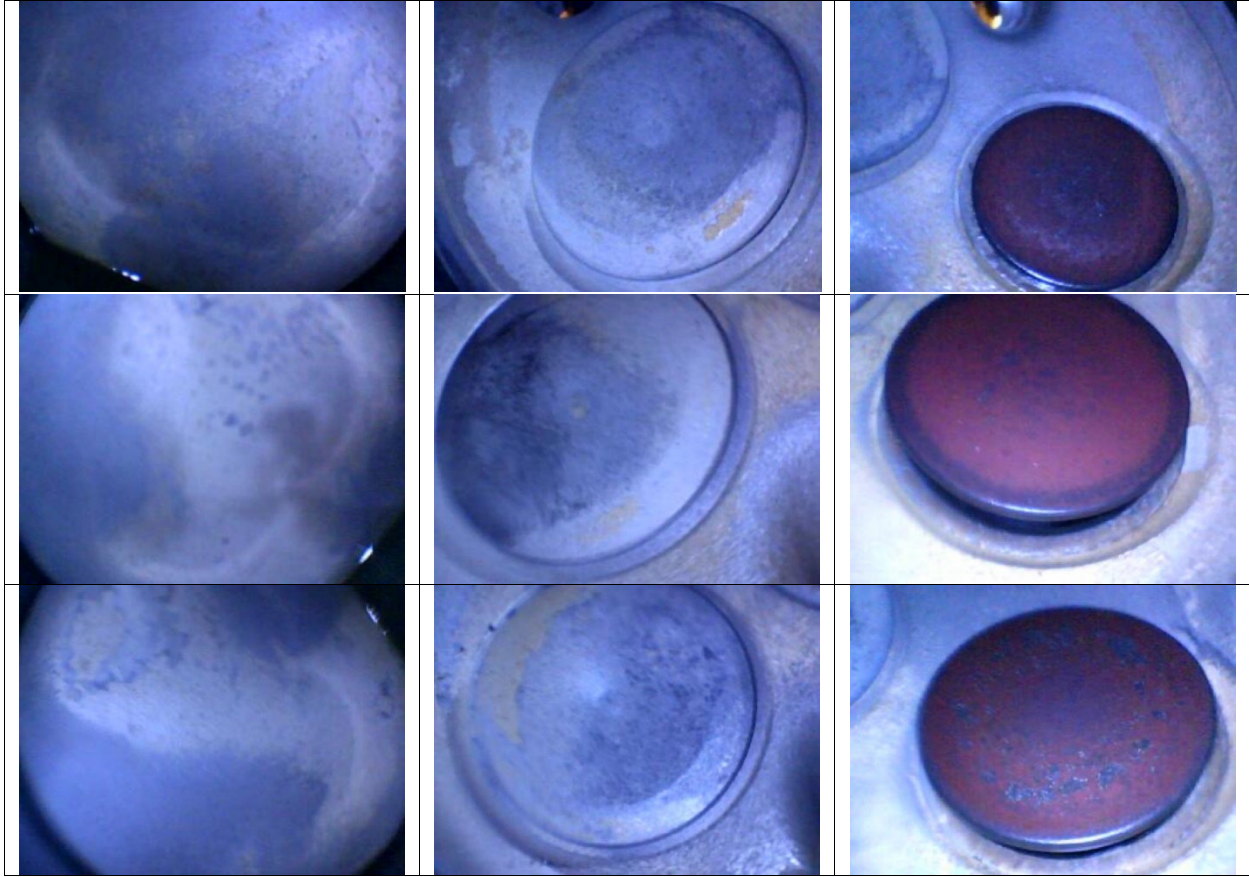


Figure 6-Cylinder Nos. 2, 4 and 6 piston domes and valve heads.

The magnetos were undamaged and not removed from the engine during the examination. The magneto P-lead wires remained secured to the magnetos and were cut near the firewall during the shipment process. During the crankshaft rotation, spark was observed at each ignition lead end (12).

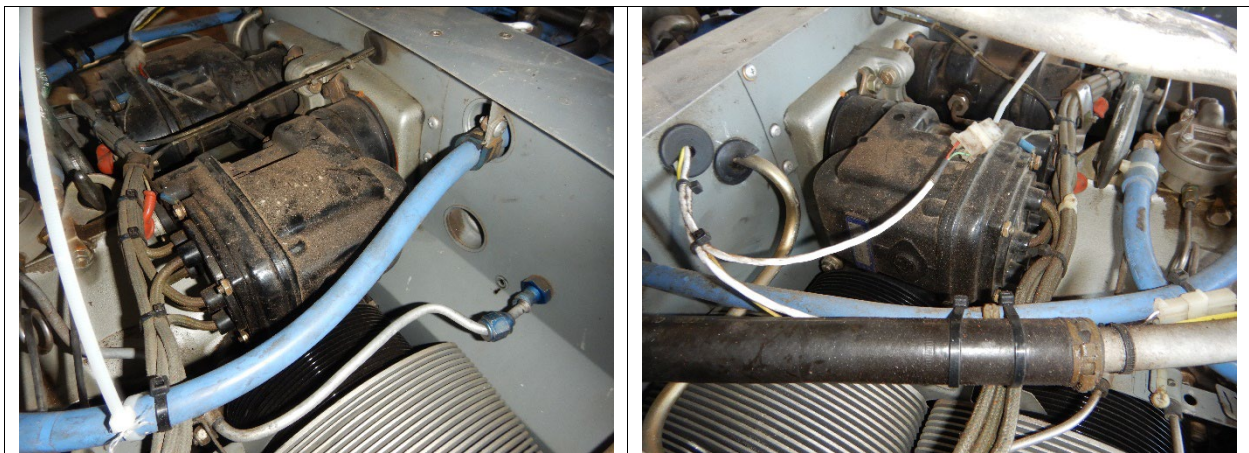


Figure 7-Magnetos.

The induction risers below the forward cylinders had impact damage. The right induction tube rubber coupling connecting to the wye duct, had impact damage. The throttle body and connecting tubing was removed from the engine. The rubber couplings and band clamps were properly attached.



Figure 8-Accessory section.

The fuel control throttle and mixture linkage arms were bent and both control cables were removed during the shipment of the engine. The linkage arms moved freely by hand. The fuel control unit was undamaged and the inlet screen was removed and contained a light amount of fibrous debris. The connecting fuel line b-nut fittings were secure. The fuel control unit was disassembled. The fuel control shafts and cavities showed normal operating signatures and the o-rings were intact and undamaged. An oily grey deposit material was found on both shaft spring assemblies.



Figure 9-Fuel control disassembly.

The oil pump was removed from the engine and disassembled. The gears of both the scavenge pump and oil pump cavities showed normal operating signatures with some hard particle passage. The oil filter was removed from the engine and disassembled. The filter can and element pleats were clear of debris.



Figure 10-Oil pump and scavenge pump disassembled.

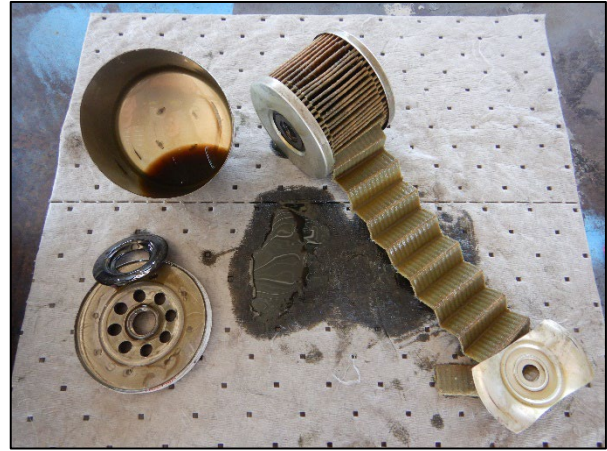


Figure 11-Oil filter disassembled.

The fuel pump was removed from the engine and attached fuel line fitting were secured. The fuel pump was undamaged, and the drive coupling was intact. The pump was rotated with a hand drill and the pump flowed fuel normally.

The fuel injectors were removed from the engine and were clear of debris.



Figure 12-Fuel pump and drive coupler.



Figure 13-Fuel injectors.

The fuel manifold valve was disassembled, and no anomalies were noted. The fuel manifold screen was clear of debris.

The fuel flow transducer was undamaged, and the fuel line b-nut fittings were secure. A 45-degree cast iron 'street' fitting was attached to the inlet side of the fuel flow transducer. The fittings were removed and were clear of debris. Pressurized air through the transducer caused the internal turbine to spin up momentarily.



Figure 14-Fuel flow transducer.

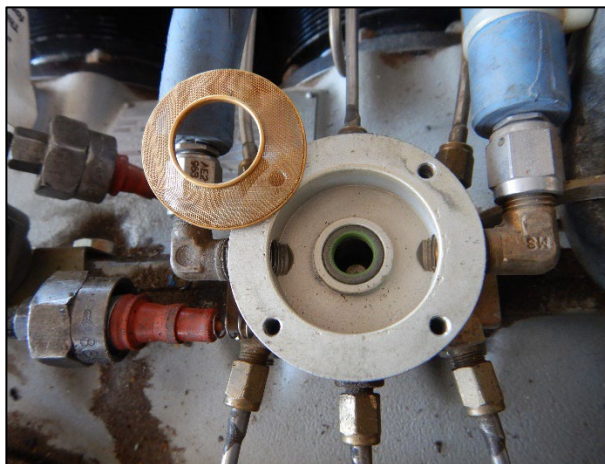


Figure 15-Fuel manifold valve.

The propeller governor was removed from the engine and the spring attachment rod on the moveable linkage was bent to one side. The damage was consistent with impacting the adjustment screw end. The propeller governor linkage moved freely by hand. The seal screen was removed and was clear of debris.



Figure 16-Propeller governor and seal/screen.



Figure 17-Propeller governor linkage damage.

The induction airbox assembly was attached to the engine and had impact damage. The airbox assembly was removed and no anomalies were noted. The Brackett air filter was undamaged and clear of debris.

The turbocharge induction side was removed from the assembly prior to the examination. The turbine shaft moved freely, and the compressor blades and scroll were undamaged. The exhaust pipe was impact damaged and was removed from the turbocharger. The turbine blades were undamaged. The turbocharger attached oil b-nut fittings were secure.



Figure 18-Turbocharger assembly.

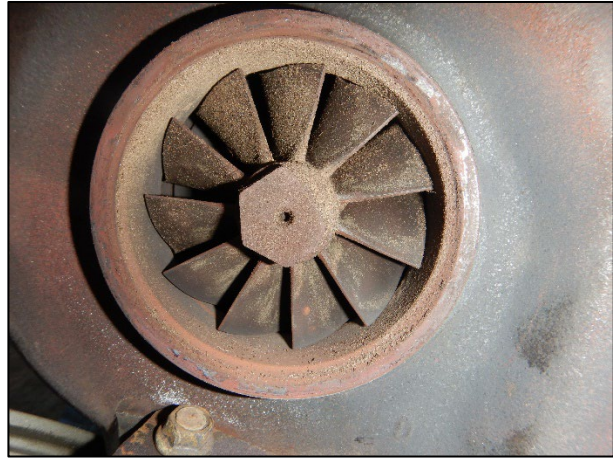


Figure 19-Turbocharger turbine blades.

The wastegate assembly inlet line fitting separated from the housing. The other b-nut fittings were secure to the wastegate assembly. The wastegate valve linkage was undamaged and moved freely under spring tension.



Figure 20-Wastegate assembly.

The controller separated from the firewall and remained loosely attached to the engine by its tubing. The attached tubing b-nut fittings were secure.

The overboost valve remained attached to the induction tube and was undamaged.

The engine's internal gearing was visible from the accessory section and covered in a residual oil and undamaged.

Submitted by: Andrew Swick