



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

August 14, 2018

AIRFRAME AND ENGINE EXAMINATION

WPR18FA219

This document contains 11 embedded photos.

A. ACCIDENT

Location: Sylmar, CA
Date: August 12, 2018
Aircraft: Beech A36TC, Registration N136RM, Serial #EA97
NTSB IIC: Samantha Link

B. EXAMINATION PARTICIPANTS:

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C. SUMMARY

Examination of the airframe and engine was conducted on August 14, 2018 at the facilities of Southwest Aircraft Transportation and Recovery in Chino, California. No obvious anomalies were noted during the examination. The engine was prepared for shipment to Continental Motors for further examination.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

- Flight control continuity was established throughout the airframe from the flight control surfaces to the controls within the cockpit.
 - The right aileron bellcrank was fractured and pulled through the aileron stop into the wing rib

- o The left rudder bellcrank located in the forward floor assembly was found fractured
- The fuel system was fracture separated in several places throughout the airframe, however, fuel was noted in all of the fractured lines
- The gear actuator was observed and was in the gear down position.
- The flap actuators were measured at 1.7 inches, which is consistent with the flaps in the up position.
- The elevator trim actuators were measured at 1.1 inches which is consistent with 5 degrees tab up.
- The fuel selector faceplate was fracture separated. The fuel selector unit was removed from the airframe and examined
 - o The screen was clear of debris
 - o Air was blown through the selector and it was positioned at the left main fuel tank.
- The auxiliary pump was not on
- 12V battery power was added to the fuel boost pump and residual fuel was pumped from the system.

1.1 Airframe photos



Figure 1: Fuel Selector



Figure 2: The Right Wing



Figure 3: Cabin Area



Figure 4: Cabin Flight Controls

2.0 Engine Examination

- The engine was removed from the attached fuselage components
- The left side of the engine sustained the most significant impact damage
 - Deformation damage noted on the cylinder #6 intake and exhaust tubes
 - The cylinder #4 rocker cover was punctured from the outside-in.
 - The exhaust manifold was displaced aft from the risers on the left side.
- All b-nut fittings (fuel, air reference, and oil) were in place and secured on their respective fittings.
 - Some fittings exhibited impact-related fracture damage.
 - Fuel inlet line to pump was fractured at pump fitting.
 - Fuel line between fuel metering unit to fuel manifold valve was fractured at metering unit.
 - Fuel was observed in line between fuel manifold valve and fuel pressure gauge.
 - There was no sign of fuel staining around any of the fuel system components.
- Throttle lever was fractured, and the mixture lever was bent.
 - The cable rod ends were attached to the levers.
 - Cable continuity was confirmed, although, they had been cut for recovery purposes
- The right magneto was slightly displaced from the mounting pad and the flange was fractured.

- The left magneto remained in place.
- The ignition harness remained in place and all terminal ends remained attached to the spark plugs.
- The upper spark plugs were removed
 - The spark plugs from cylinders 1, 3, and 5 were oil coated.
 - There were no signs of lead or carbon fouling.
 - The spark plugs from cylinders 2, 4, and 6 were coated in dirt and dust consistent with that found at the accident site.
- Borescope inspection of the cylinders revealed no pre-accident anomalies with the pistons, barrels, valves, and valve seats.
 - Dirt and debris from the accident site was noted in the #4 and #6 cylinders.
- Thumb compression was obtained on all six cylinders, however the #6 cylinder was weak.
- Valve train and crankshaft continuity was confirmed throughout the engine.
- All oil lines to and from the turbocharger bearing, wastegate actuator, and VAPC were in place and intact.
- Rotation of the turbocharger turbine resulted in coinciding rotation of the impeller with no binding noted.
- The vent plugs for both magnetos were removed and the distributor gears rotated during the manual rotation of the crankshaft. All distributor gear teeth appeared to be intact.
- The engine was prepared to be shipped to the manufacturer for further examination.

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2.1 Engine Photos



Figure 5: Left Side of Engine



Figure 6: Turbocharger System



Figure 7: Magnetos



Figure 8: Upper Spark Plugs

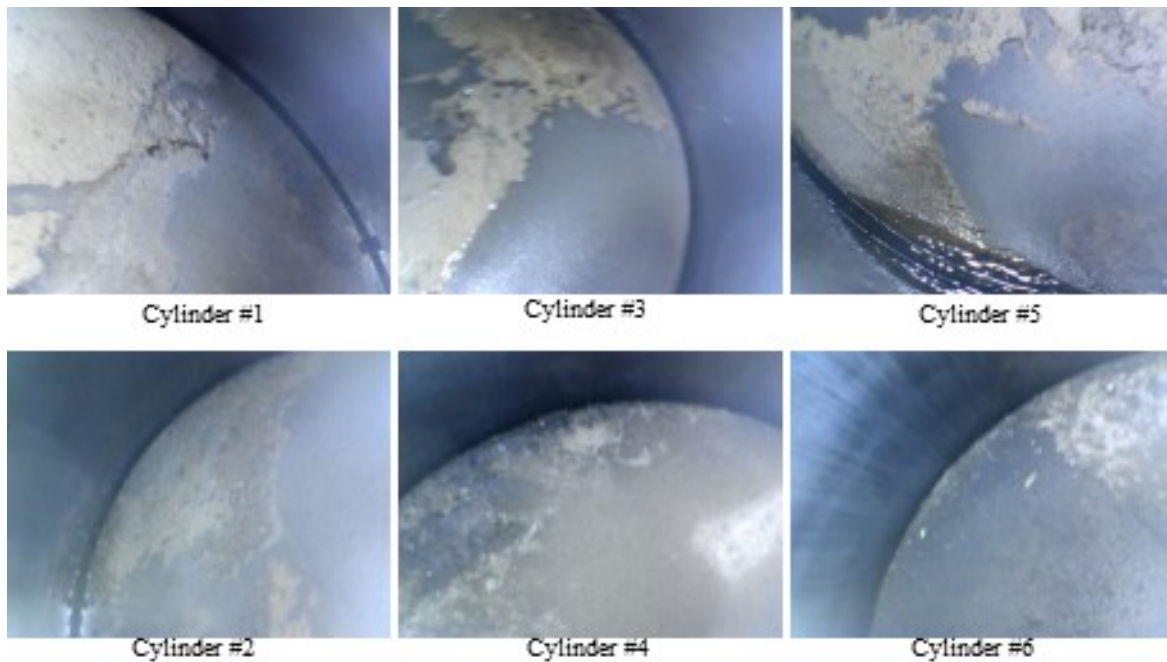


Figure 9: Borescope Images of Piston Faces and Cylinder Walls

3.0 Propeller Examination

- Propeller assembly remained attached to crankshaft and was removed
- All 3 pitch change links were found fractured
- Blade #2 was found curled toward low pitch and exhibited chordwise paint burnishing
- Blade #1 was bent aft near the root of the blade
- Blade #3 was bent both near the root and the outboard portion of the blade
- The propeller governor was observed fractured and the pump gear were visible
 - The propeller control cable remained attached, but the housing was
 - fractured

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3.1 Propeller Photos



Figure 10: Propeller Assembly



Figure 11: Propeller Blade #2

END.

Submitted by: Samantha Link