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April 29, 2020

To: Whom It May Concern

Subject: Ercoupe N3437H [Aircraft Accident - WPR20LA094]

On May 29, 2020 at 10:30 am I Benjamin O'Con began inspection on aircraft N3437H 1946 Ercoupe model 415-C serial number 4062. The Owner Linda Abrams described that on February 25, 2020 about 12:20pm during touch and go operations on the third and final take off at about $\frac{3}{4}$ of the runway left and at around 200 Ft in altitude she experienced a rhythmic decrease and recovery of power. Mrs. Abrams noted that the "dips in power" or decrease and recovery of power was enough to lose altitude and she made the decision to immediately return for a forced landing.

I first began the inspection by removing the cowling in which I was informed had not be touched by anyone since the accident other than when the mechanic reached into the left lower cowl to drain the fuel from the aircraft. Upon viewing the Continental engine model C85-12F serial number 2189-6-12 all components were intact and un damaged. I removed the upper massive spark plugs which were found dry and were previously installed with silver anti-seize compound. I found the ignition harness leads and spark plugs to be tight and good condition. I confirmed the firing order of compression to be in the correct order, compression was tested to be equal and strong between all cylinders. Upon rotating the engine, I found that both magnetos would impulse at the correct position no binding noises heard. I removed the bottom ignition leads and verified spark from all 8 leads in the correct corresponding firing order, the spark was bright and normal. I removed the lower fine wire spark plugs; three plugs were dry but the number two lower plug was filled with oil. I attached each spark plug to the ignition harness and check for spark. All eight spark plugs including the lower number two with oil sparked sufficiently.

Next, I went into checking the valve train, rotated the engine and verified rocker arm lift distance that showed consistency with a good camshaft between all rocker arms. Tappet clearance between rocker arms and valve stems were in limitations on seven of the eight rocker arms. The number two intake rocker arm measured at .115 inches over max limitation of .110 inches. Corrosion was found on rocker arms, valve springs and valve spring retainers. During a borescope of the cylinder barrels corrosion and some small amounts of oil was noticed however not out of the normal for this type of engine in its age and time on unit. I removed the valve springs and checked for tension all seem to be normal and satisfactory. Rocker arm bushings and shafts exhibit normal wear patterns for the amount of time on the engine. The intake and exhaust valves moved in and out of their respective guides with no issues or binding, clearances between them seemed normal. These cylinders were manufactured by Engine components on a PMA and roto-coils are installed on the exhaust side. The roto-coils have traces of corrosion three rotated normally but the number one cylinder's exhaust roto-coil was binding up slightly not consistent with the rest.

Timing of the magnetos to the engine was verified to be 28 degrees on the left and 24 degrees on the right magneto. According to Continental Motors MSB94-8D magneto timing for this engine should be set to 30 degrees left and 28 degrees right magneto. The Bendix magnetos were equipped with magneto filters and the left magneto's P-lead was finger tight when the right magneto's P-lead was sufficiently tight. The ignition switch was verified to ground magnetos when off and unground them when each and both magnetos were selected on. The base mounting of the magnetos to the rear case of the engine were found to be tightened sufficiently.

Fuel tank venting was checked by verifying that each fuel tank cap vent was open and clear of obstruction also noting that tank caps cannot be installed in the incorrect position. The fuel selector was verified off and on by blowing through the main feed line with free flow in on position and no flow in the off position. This aircraft is equipped with automatic cross feed fuel tanks, the fuel is diverted from the two wing tanks (25-gallon capacity) via mechanical fuel pump to the header tank (7-gallon capacity) the fuel is then gravity fed to the main fuel line directly to the gascolator mounted to the carburetor. The engine driven mechanical fuel pump is mounted to the front right side of the engine actuated by a lobe on the front of the engine's camshaft. Fuel pump operation was verified by turning the propeller and allowing the fuel pump to suck up liquid on the in port and release liquid from the out port. The fuel lines attached to the fuel pump and firewall along with lines to the main fuel tanks were checked for free flow with no obstructions.

Inspection of the rigging for the throttle control found that the throttle arm is able to slide in its mounting clamp. Upon applying slight pressure to the throttle control arm the throttle control sheathing is able to move forward and aft just under $\frac{3}{4}$'s of an inch. Testing this action, it was found that the movement of the control cable is not noticeable in the cockpit. In the cockpit placing the lock on the throttle control and moving the throttle arm forward and aft does not reflect movement of the throttle control in the cockpit. This was also tested with the throttle lock off and a person holding the throttle control fire wall forward, moving the throttle arm forward and aft, movement of the throttle control was not physically felt in the cockpit. Further inspection of the amount of forward and aft play in the throttle control showed that in relation the butterfly of the carburetor would deflect roughly 10 to 15 degrees at full throttle and 20 to 25 degrees at half throttle.

The fuel was drained by the mechanic directly after the accident so its unknown to me how many gallons of fuel were on board at the time of the accident. Fuel was found in the gascolator filled almost completely to the top. The fuel that was recovered from the gascolator was blue with a smell of good 100LL fuel, no dirt, residue or water was noticed. The gascolator bowl was found with substantial corrosion inside, no debris were recovered. The main fuel feed line is mounted with a 45-degree fitting to the gascolator which is then mounted to a 90-degree fitting directly on the carburetor. The gascolator and the carburetor screens appeared to be free of obstruction or debris. The carburetor bowl was found empty of fuel due to being mounted above the gascolator and above the level of where the fuel was drained from. The airbox carb heat butterfly seemed to seal and actuate as they should. A bore-scope of the exhaust system found no obstructions or interference. The fuel primer was checked and found to be functioning as it should. Disassembly of the carburetor found no issues with the float and was tested for buoyancy in a cup of water which was found satisfactory. The float needle valve seemed to be functioning correctly and no issues with its seating or the seat was noted. All ports jets and orifices of the carburetor were checked no obstructions were found.

This concludes my inspection of Ercoupe N3437H [Aircraft Accident - WPR20LA094], this letter is accompanied with pictures taken during inspection and a video of the throttle control arm and linkage.

If you have any further questions, please do not hesitate to contact me anytime.

Thank you,

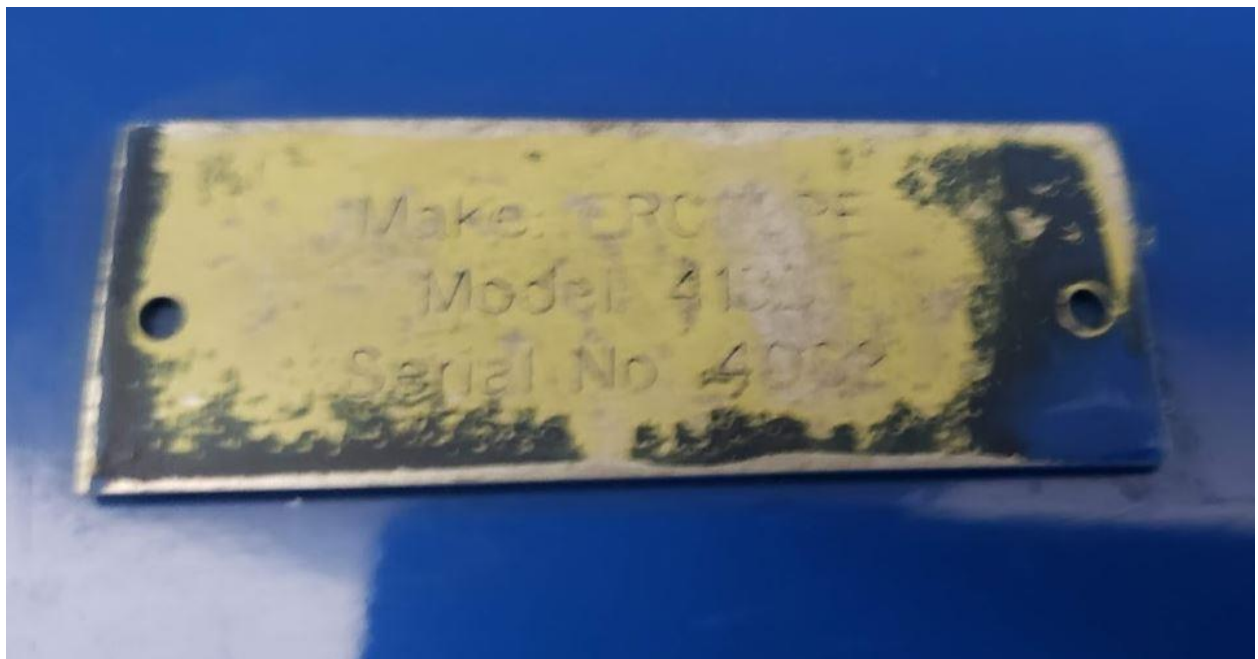
A handwritten signature in dark ink, which appears to be "Ben O'Con", is written over a thick black horizontal redaction bar.

Ben O'Con

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