

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



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ENGINE TEST RUN FACTUAL OBSERVATIONS

3/14/2025

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A. ACCIDENT

Location: Rockport, TX
Date: June 24, 2023
Time: 1615 CDT
Airplane: N123SM

B. ENGINE TEST RUN FACTUAL OBSERVATIONS

IIC	John Brannen NTSB Denver, CO
Party Coordinator	Phillip Grice Continental Aerospace Mobile, AL
Technical Specialist	Lisa Jersild Continental Aerospace Mobile, AL
Technical Specialist	Randy Bryant Continental Aerospace Mobile, AL

C. SUMMARY

D. DETAILS OF THE EXAMINATION

1.0 Right engine test run

The right engine was shipped to the Continental Aerospace facilities in Mobile, Alabama, for either teardown examination or for engine test run as appropriate. After uncrating it was determined that the engine was a candidate for test run in a Continental Aerospace engine test cell. The engine was prepared for the test run on January 15-16, 2025 and the test run of the engine was accomplished on January 17, 2025. When prepared for the test run, unnecessary engine components were removed and some components replaced with slave components to facilitate installation in the engine test cell. Components removed included the alternator, and engine cooling baffles. Components replaced with slave components included the engine exhaust, and the turbocharger wastegate and actuator. The engine was able

to run and develop full rated power but could only do so if the oil drain line from the turbocharger controller was blocked off allowing the slave wastegate to close. Without blocking the controller drain, the engine would not run above a mid-range rpm, and it was noted that the wastegate remained fully open. Attempts were made to adjust the wastegate controller during the test run to achieve a satisfactory run but were unsuccessful. At this time, it was decided to remove the wastegate controller and wastegate actuator and send them to Hartzell (manufacturer of these components) for testing. (See separate report of the testing of these components.) In summary some deficiencies were found regarding the wastegate controller in terms of adjustment and one missing screw. The manufacturer remedied the deficiencies and returned the controller and actuator to Continental Aerospace for further engine test run. The adjustment errors discovered by the manufacturer may have been to adjustments made in the test cell to achieve a satisfactory run but could not be verified. The effect of the missing screw could also not be determined.

On March 10, 2025, the same individuals re-convened to complete the test running of the right engine. The engine was prepared as before using components from the engine installation in the airframe except for the exhaust piping and wastegate actuator. Again, the engine would not develop full power. It was noted that, as before, the wastegate was remaining fully open. It was decided to remove the slave wastegate actuator and install the actuator from the aircraft for testing which required changing of bracketry to fit on the slave exhaust piping. Once the original actuator was installed the wastegate actuated as expected. During initial running, it was discovered that the engine fuel flow was too high and was not in the range specified by the engine manufacturer. Because of this, the engine would stumble due to a rich mixture in mid-range operation. Adjustment was made to the aneroid adjustment on the engine driven fuel pump to bring the fuel flow parameter within the engine manufacturer's specifications. While performing this adjustment, it was discovered that the aneroid adjustment screw locking nut was not tight. Once fuel flow adjustment was accomplished, the engine was run and developed full power. The engine was able to accelerate smoothly from idle to full throttle with normal advancement of the throttle control. With the engine at full power, the engine test cell gauges indicated about 2,300 rpm at 38.7 inches of manifold pressure. The previous unsuccessful engine runs were deemed to be a result of an unknown incompatibility with the slave components used for testing. When using the original airframe components the engine was able to run and develop full power. The unsuccessful previous engine runs appeared to be a result of an unknown incompatibility between the wastegate controller and the slave wastegate actuator.

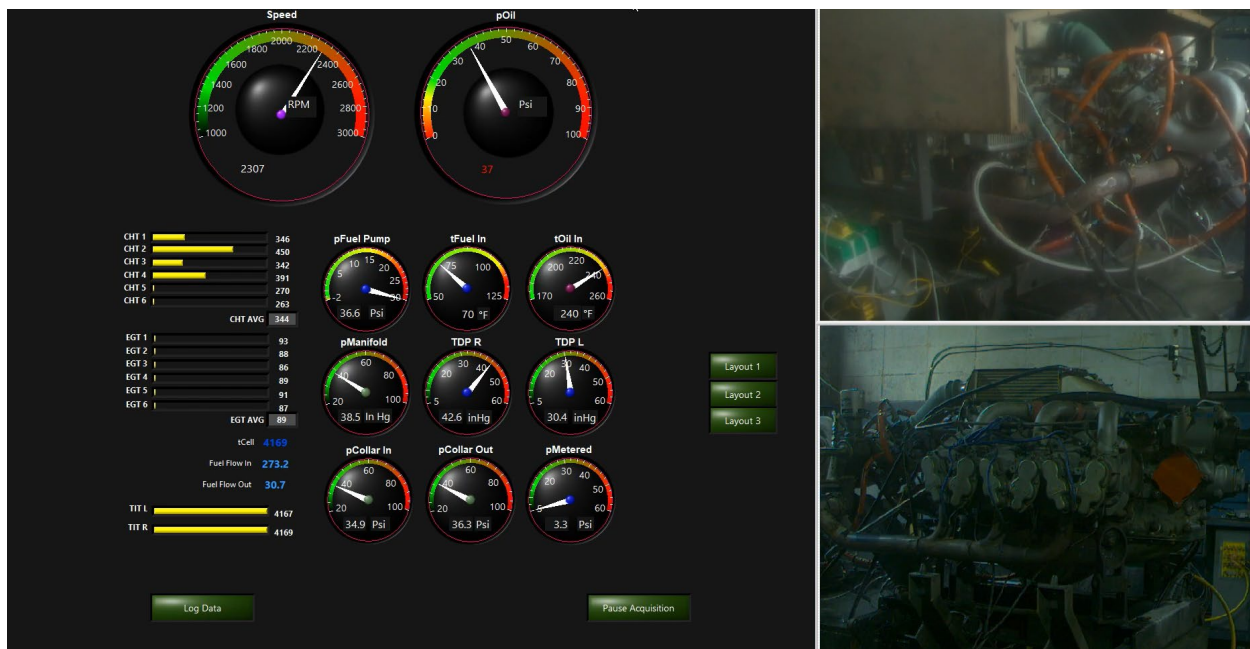


Figure 1. Engine test cell monitor image during the final test run. (NTSB Photo)

Submitted by:

John Brannen
NTSB IIC