

Communication Summary

5/21/2015

Information From: Mr. Trevor Lewis, Triumph



Summary & Factual Information: Mr. Lewis commented on the facts of the case. The comments, in part, included:

An ambient pressure sensor test revealed that the sensor was consistently reading 0.5 psia (pounds per square inch absolute) below the actual pressure across the pressure range. The fault limit for the test is +/- 0.4 psia.

The incident recorder data indicates that engine began to lose power with no changes to collective or throttle settings. As a result, power turbine (Np) and rotor (Nr) speeds drooped to 89% over a period of 6 seconds, even as the ECU opened the fuel metering valve towards the maximum flow limit. Collective was then lowered to flat pitch and Np/Nr subsequently recovered to 100%. Np/Nr remained at 100% as collective was increased to 48%, but after approximately 30 seconds, the engine again began to lose power. Collective was then lowered for approximately 12 seconds and then quickly increased to 72%. At the same time, the ECU detected and recorded an engine surge. The throttle was then moved to the idle stop and the gas generator decelerated to the ground idle speed of 63%.

The last engine run fault data does not indicate the Np exceedance fault (NpLmTOut) which would have been detected when Np reached 107.3%. The incident recorder data also indicates that Np only reached 104% (although with 1.2 second data resolution, it may have gone slightly higher). Therefore, the 108.99% recorded Np peak likely occurred during a previous flight.

With the pressure sensor reading 0.5 psia low, the less aggressive accels/decels would make the engine less likely to surge. In addition, the nominal fuel flow of 340 pph observed in the incident recorder data prior to the engine power loss is significantly lower than the 5% reduction from the 500 pph maximum flow limit.

In reference to FAA Communication Summary, the following was further commented:

At 4.93Volts, the 5V rail is still within the acceptable limits for all devices powered by the 5V rail. In addition, the incident recorder data demonstrates that primary channel did not reset and remained in control throughout the engine power loss event.

The WFMV (Weight Flow Metering Valve) [fuel flow to the engine] signal failure occurred for an open-circuit condition during the Environmental Stress Screen. Under no-fault conditions, the WFMV signal passed all accuracy requirements. The incident recorder data indicates that there were no WFMV signal failures during the engine power loss event.

I can attest that the above summary is correct to the best of my knowledge:

Edward F. Malinowski
National Transportation Safety Board
Air Safety Investigator