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From: [REDACTED]
Sent: Fri 12/17/2010 8:08:33 PM
Subject: GII apu

Jeffrey,
Gulfstream APU flamed out during start today, I told Meridian maintenance at TEB to start the apu every day this week to make sure all is good,. today it finally failed during start,. Dallas Air motive is going to Meridian today and help trouble shoot apu,. I will keep you posted,.
thanks,
Larry

Hi Larry,

It seems like you have a lot of expert help coming your way.

I don't want to confuse anything, but will throw in my thoughts for what they are worth;

I question the Monopole, I would think that it would affect the cockpit indication also. There was a note in a study guide of tapping gently with the back end of a screwdriver while running to check for this.

Since the APU does a relight, or never actually flames out at 80%, it hasn't tripped the over speed (if it did the fuel would be cut off, no smoking, and would not relight until power removed and back on)

I suspect a sticking loadstat.

The loadstat is one of the probes in the exhaust pipe (the other is EGT probe). It is a thermally operated pressure relief valve.

During start, the compressor pressure is trapped by the closed stat. as pressure increases, fuel flow increases, more speed, more psi, more fuel, etc.

When the pressure reaches the amount required for full speed, the stat will open and maintain the pressure and speed. The stat is shimmed as the adjustment for full speed operation. When a load is applied and the speed droops, the stat closes, more fuel until it reaches speed, then the stat opens to maintain the speed.

I suspect that it is staying closed till 103%, popping open and sticking open. When the APU drops to 80%, and the pressure drops, it closes and the APU now gets more fuel to go to 100% (the ignition should engage whenever below 90% unless overspeed was latched).

From a 1977 Airwork training manual;

"IF THE LOAD CONTROL VALVE OPENS TOO RAPIDLY, THE LOAD CONTROL THERMOSTAT CANNOT RESPOND QUICKLY ENOUGH TO PREVENT ACTUATION OF THE ACCELERATION THERMOSTAT (THE LOADSTAT). THIS WOULD RESULT IN THE APU DROOPING DOWN IN SPEED (WHILE LOADED) AND UNLOADING WHEN 95% SWITCH OPENS. THIS CYCLE, IN SOME CASES, MAY BE FOR AN INDEFINITE PERIOD AND IN OTHER CASES, ONLY ONE OR TWO CYCLES MAY OCCUR. THE PROBLEM MAY BE CORRECTED BY INCREASING THE LOAD CONTROL VALVE OPENING TIME".

There was another item for hung start, "If the unit has hung start, with low EGT- Check the

loadstat/acceleration air system for leakage."

Of course, there is always the fuel control unit itself- I hope not!

Good luck, and let me know if I can do anything else for you.

If you can limp it back here, I'll be sure to be available to carry on with it.

Pete