

CASE STUDY

Bleed air leaks on Citation III



Jet-Care GPA
T: +44 (0) 1256 701777
www.jet-care.com

CONDITION MONITORING EXCELLENCE

Highlighted increase in engine ITT, Inter-Turbine Temperature, leads to early correction.

INTRODUCTION

An operator had previously had an advisory due to a single parameter change. Jet-Care requested information as to whether any maintenance had been carried out on the aircraft or engines. The operator reported that no work had been carried out.

GAS PATH ANALYSIS

Further to our advisory e-mail (kneepad data), an earlier telephone conversation and our customer's DEEC download, we confirmed a significant increase of #1 Engine ITT (+15C).

Knowing no maintenance had been carried out, we recommended early investigation for:

- Probable bleed air leaks/ valve operations.
- Possible hot section distress/damage (if no clear sign of Bleed air problem).

ACTION/FOLLOW UP

The customer discovered a severe bleed air leak in the HP system, corrected all leaks and performed five point runs. The aircraft engine temperatures were well within limits and the #1 Engine was now actually running cooler than the #2. The bleed leaks were in the airframe pre-cooler assembly on top of the engine. There are some flexible bellows that attach the bleed airlines to the pre-cooler. Both of these bellows were leaking. One was completely blown out and the other was leaking around the seam weld. The pre-cooler itself was also leaking when it was pressure tested off of the engine. So both bellow lines and the pre-cooler were replaced. This brought the ITT back to well within limits.

CONCLUSION

Besides bringing the engine temperatures back to within limits, bleed leaks can, if uncorrected, cause extensive and expensive damage to engines, cowling and wiring.

