

ATA 36

Engine bleed air system



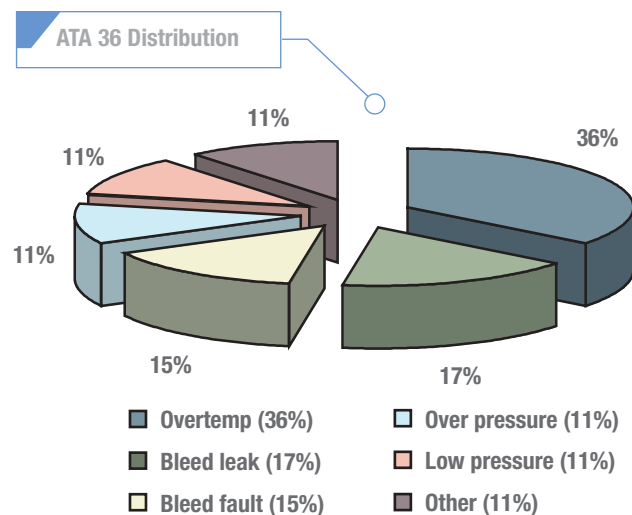
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During 2004, 8% of all in-flight interruptions have been attributed to ATA chapter 36. Analysis of these interruptions clearly shows that the main causes are either bleed air duct leak detection or bleed air over-temperature regulation (leading to single or double bleed loss). These two main reasons are driving more than 60% of ATA chapter 36 interruptions.

The main contributors to these failure modes are well identified and have fixes already available:

- Temperature Control Thermostat (TCT) failure is one major contributor to the over-temperature regulation (either TCT failure or TCT filter clogging)
- Bleed air duct seal leakage for bleed air leaks.



Proposal 1 BLEED AIR DUCTS LEAKS

Investigation revealed that bleed air ducts leaks represent 17% of in-flight interruptions. For this type of failure mode there are two possible solutions.

The first solution (considered as a preventive action) is the application of the MPD tasks for preventive seals replacement (ABS0737 considered as the best reliable seal from previous design). These recommendations are also described in SIL 36-047.

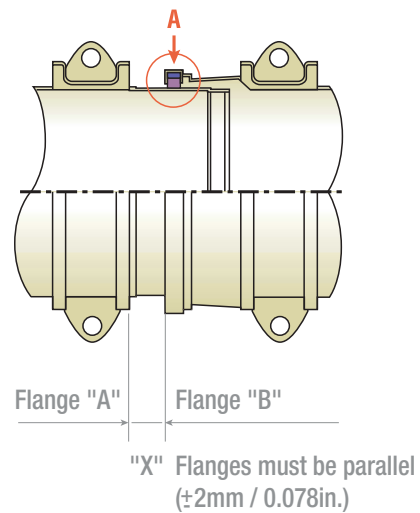


The new technology developed

for the bleed air duct seals is also available for the air conditioning packs through SB A320-21-1153 (available second quarter of 2005). It should be noted that bleed air leaks in the pack bay will trigger a wing leak warning and as such contribute to ATA36 reliability performance.

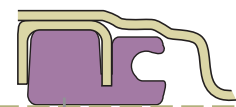
Bleed air duct seal installation

Typical installation



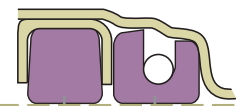
Previous seals designs

ABS 0605 type



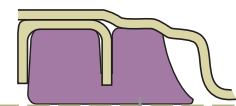
Peri-seal

NSA 8054 type



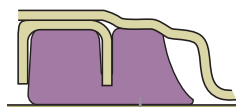
peri-seal Peri-airseal

ABS 0632 type



peri-seal

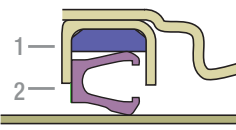
ABS 0737 type



Male duct peri-seal

New seal design

ABS1040-XXX



← Ambient air Bleed air →

**Proposal 2
BLEED OVER-TEMPERATURE
DUE TO TCT FAILURE**

Part of 51% of in flight interruptions (combined bleed fault and over-temperature). For information: bleed fault warnings can be due to either an over-temperature or an over-pressure. From experience, it is considered that a large part of bleed faults are due over-temperature and consequently linked to TCT behaviour.

The type of failure is known to be due to a particular TCT Part Number (PN). An improved PN is available to address this issue and application of a one-time TCT inspection, as per SB A320-36-1049, will allow the TCT PN to be identified and replaced if required.

+ Ease of implementation
Low cost

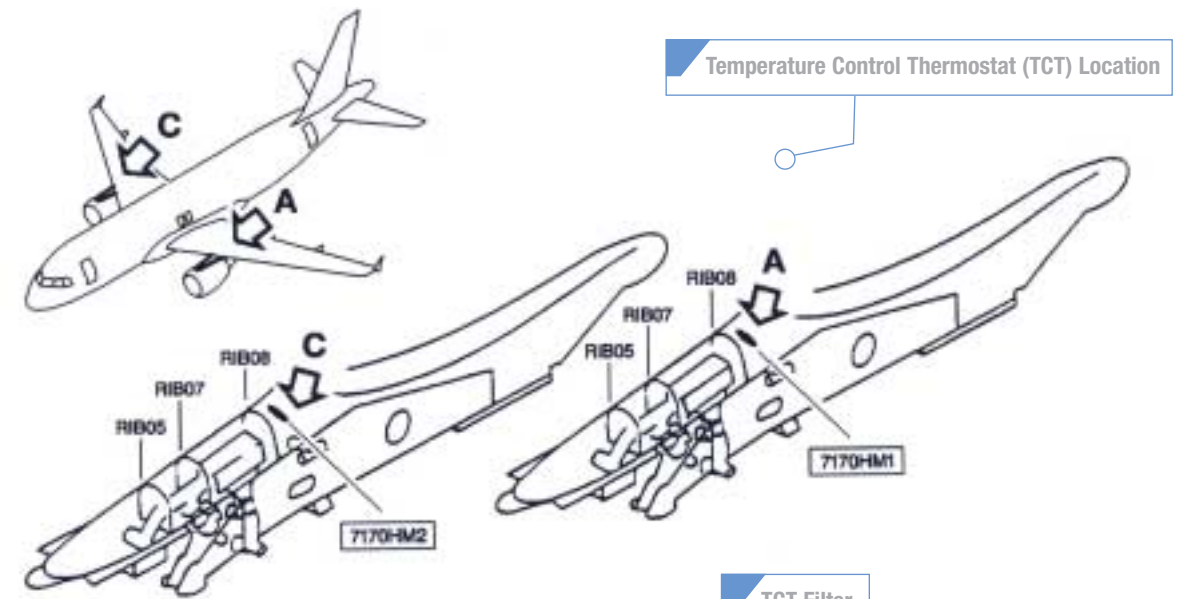
- None

The second solution offers a far greater service life and is considered the final fix. It incorporates a new design of bleed air duct seal, ABS1040, and is available through SB A320-36-1043 (Modification 32027, Embodiment rank MSN 1830).

+ Ease of implementation
Low cost

- None

Examples of TCT clogged filters



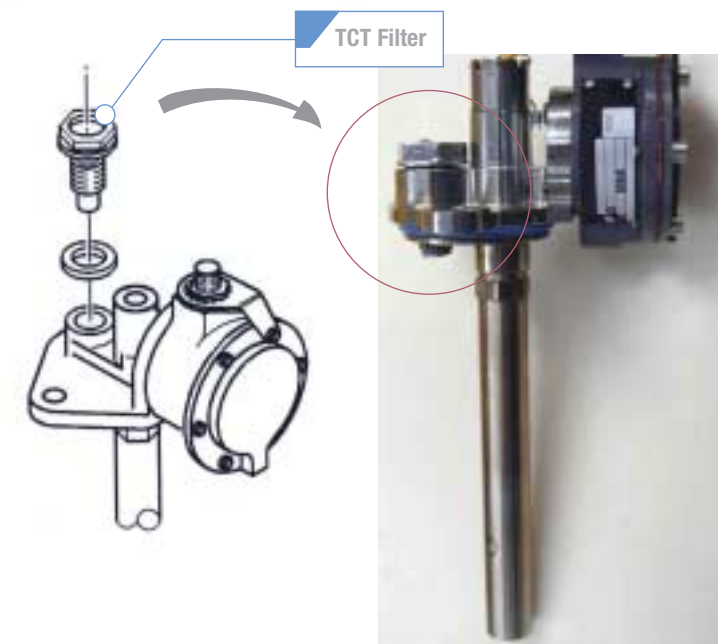
**Proposal 3
BLEED OVER-TEMPERATURE
DUE TO TCT FILTER
CONTAMINATION**

Part of 51% of in flight interruptions (combined bleed fault and over-temperature).

Another well known possibility for bleed air over-temperature is the TCT filter clogging. To address this issue regular filter cleaning is recommended and is available through the application of the corresponding MPD task. Today's recommended interval is 20 months. Nevertheless, depending on operating environment and operator's experience, a less or a more frequent initial interval may be used. For example, it has been well established that Middle East operators were more affected than others. This recommendation is also described in SIL 36-055.

+ Ease of implementation
Low cost

- None



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