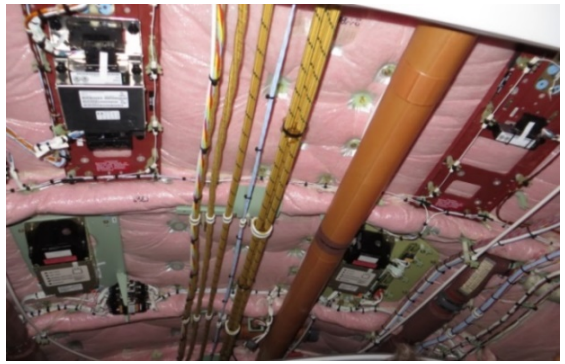
CABIN HEAVY CONDENSATION

Reference: 21.00.00.068 Issue date: 01-FEB-2024 Last check date: 01-FEB-2024 Status: Closed
A/C type/serie: A321 ATA: 21-00, 25-80, 53-20, ...
Engine manufacturer: Supplier:
Purpose / Reason for revision: Template update, TFU closure

Engineering Support Status: Closed

Issue Description / Consequence

- Heavy condensation has been observed in the cabin of recent A321 aircraft.
- Main cabin and structure impacted areas are located close to the PAX door 2 and 3.
- Water condensation leaks are mainly found during climbing and descent phases.
- Consequence: Cabin elements and passenger comfort can be impacted in case of heavy condensation.



Root Cause / Investigation

Cabin condensation contributors are:

- Long flights, around 6 hours,
- Flights between cold and warm world areas,
- Full PAX density,
- Short turn-around.
- A/C investigations launched in order to perfectible installation at insulation blankets overlapping and cut-outs were found.

Terminating Action

ATA 25 & 53 SBs issues have been provided to contain "*rain in the plane*" phenomenon:

- Improvement of the installation of the insulation blankets
- Longer water seals on the sides of the OHSC and Door 2&3 frame linings
- Structure drainage solution installing a gutter above PAX door 3 & PAX door 2

Applicability:

A321

Reference / Documentation:

MOD 160338 - MP K30142 - SB 25-1BGG & SB 25-1BL3
MOD 161847 - MP K30009
MOD 164220 - MP K32217

MOD 160425 - MP K30481
MOD 160392 - MP K30339 - SB 25-1BGH & SB 25-1BL4

MOD 162174 - MP P20412 - SB 25-1BJ5 & SB 25-1BJ6
MOD 162307 - MP P20422

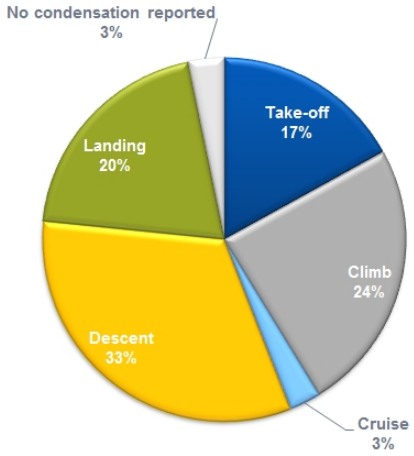
MOD 162472 - MP K30828 - SB 53-1327 & SB 53-1392
MOD 37713 - MP K11582

Description

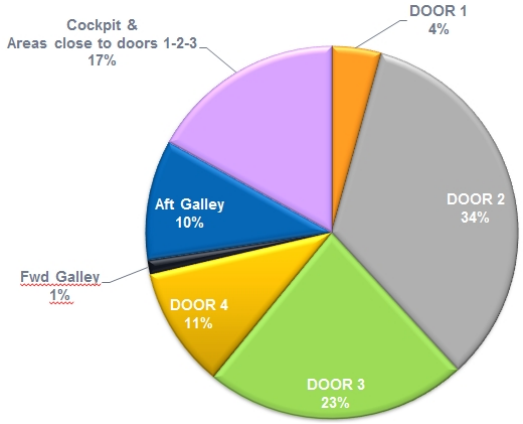
Condensation is a normal phenomenon on all Airbus aircraft.
Indeed, humid air coming from the cabin condensates at the contact of the cold aircraft structure.
Recently, heavy condensation and "*rain in the plane*" have been observed in the cabin of recent A321.

Main cabin and structure impacted areas are located in the centre fuselage, close to the PAX doors 2 and 3.

Water condensation leaks in the cabin ("*rain in the plane*") are mainly observed during climbing and descent phases.



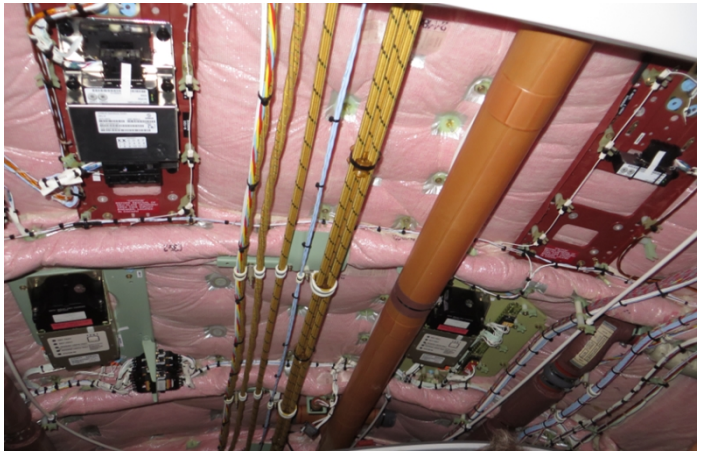
Flight phases where condensation is mainly experienced



Main location where condensation is mainly experienced

Consequence

Water drops are observed coming from the cabin ceiling panels which may generate passenger discomfort.
At the upper side of the fuselage, after removal of the ceiling panels, insulation blankets were found wet.



Carpets close to PAX doors 2 and 3 were also found wet.

Repercussions on A/C Operations

Cabin elements and passenger comfort can be impacted in case of heavy condensation.

Investigation Status

Heavy condensation was already observed several years ago.

Investigations identified the following cabin contributors:

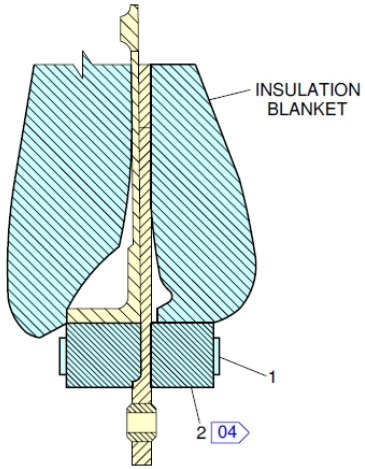
- Long flights, around 6 hours,
- Flights between cold and warm world areas,
- Full PAX density,
- Short turn-around.

Recent investigations have been performed to identify contributors to the abnormal water penetration in the cabin. Regarding insulation blankets, some overlapping installations and cut-outs have been found perfectible.

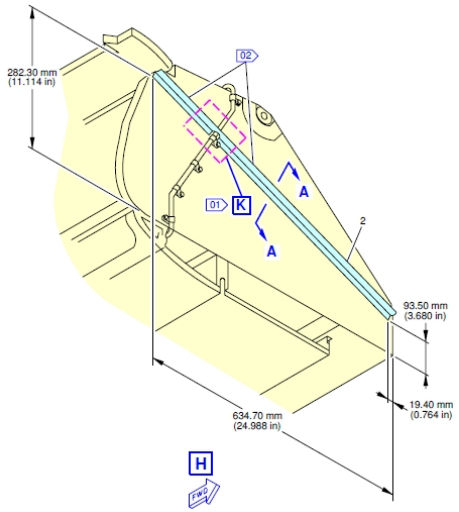
Permanent Solution

ATA 25 & 53: SBs have been issued to improve drainage and decrease "*rain in the plane*" phenomenon.
Results of the cabin items evaluation been satisfying, the following modifications at the doors 2 and 3 areas will be available via Airbus SBs:

Improvement of the installation of the insulation blankets,

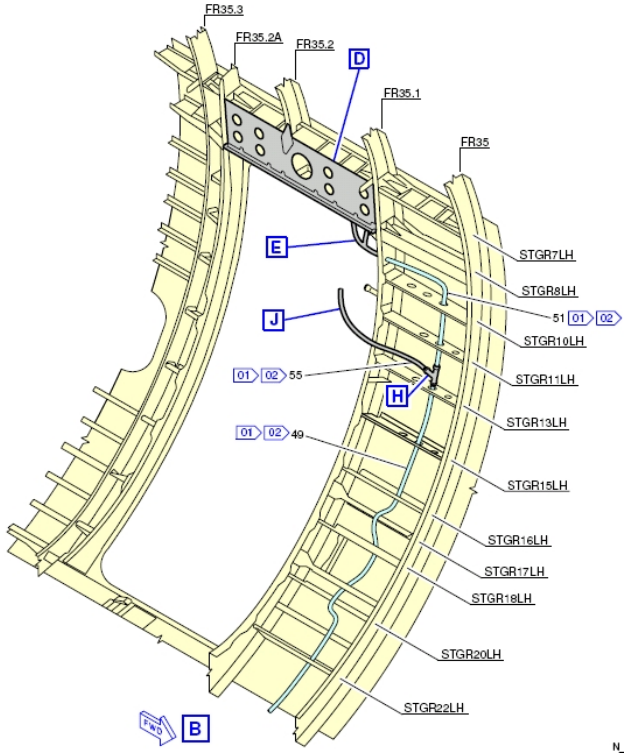


Longer water seals on the side of the OHSC.



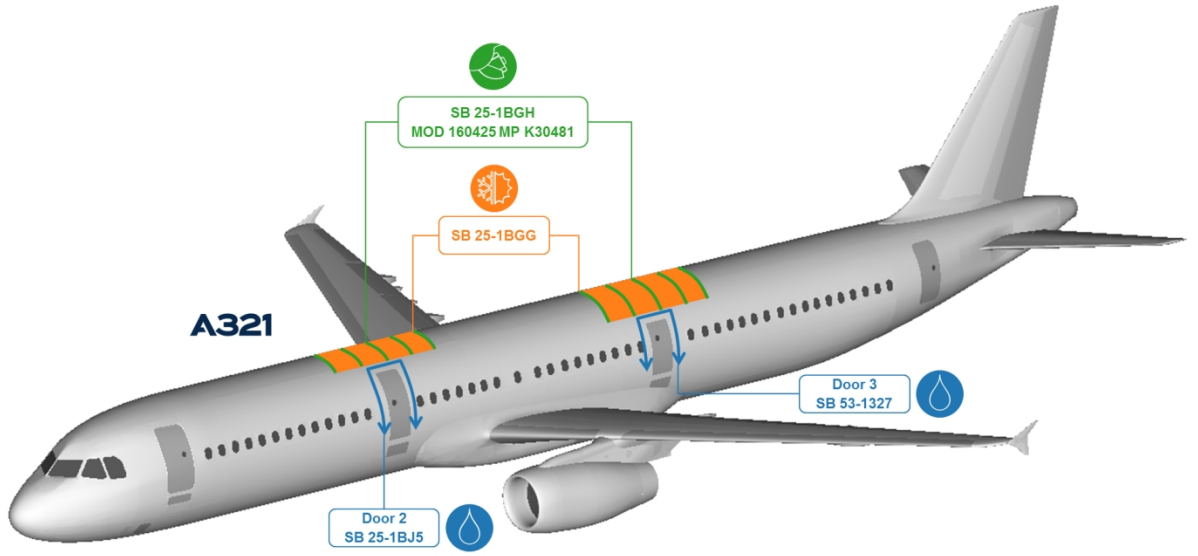
By the meantime, structure drainage solution introduced by SB53-1327 will be improved with a new modification installing a gutter above PAX door 3.

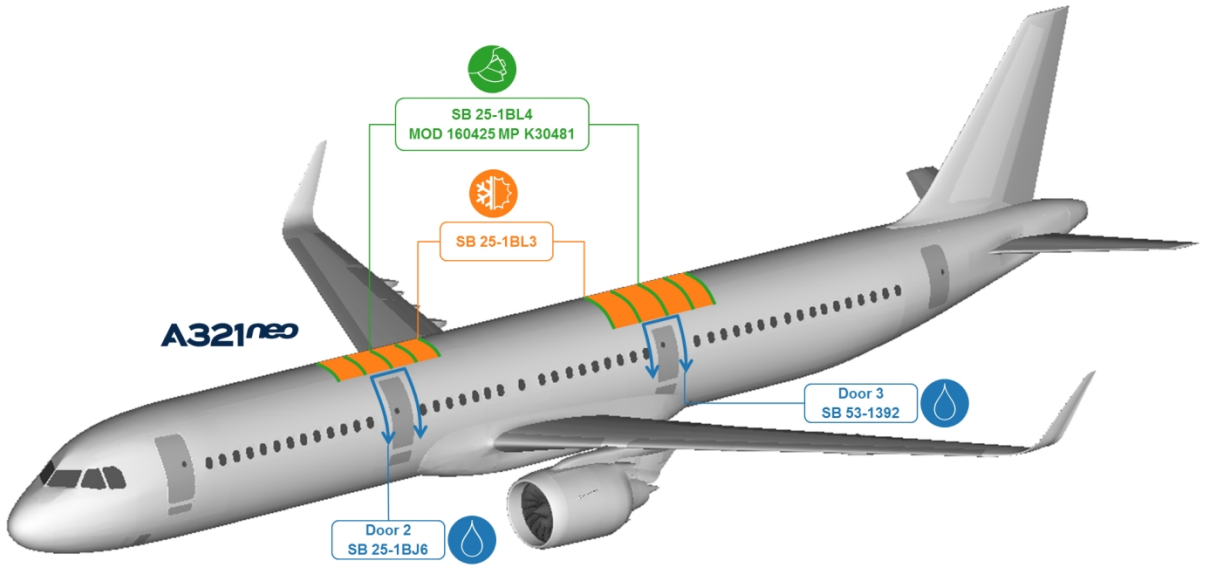
Similar modification were introduced at PAX door 2 with SB 25-1BJ5.

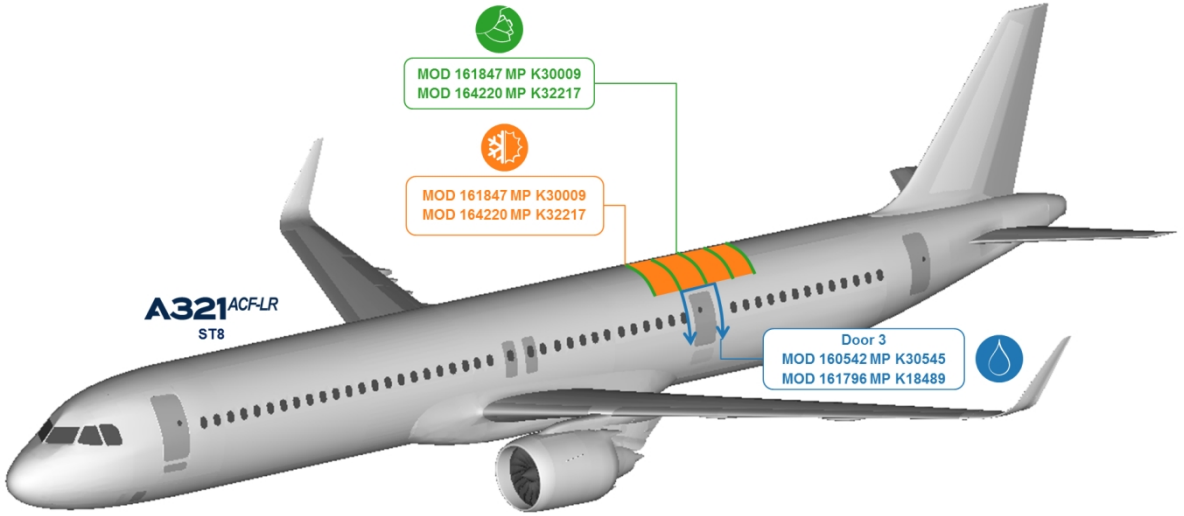


Hereafter are defined all the modifications and SBs available that contribute to reduce heavy condensation effects and improve passengers comfort:

		INSULATION MOD	OHDS SEALING	DRAINAGE OPTIMIZATION
A321 CEO ST2	PRODUCTION	As per manufacturing best practice	MOD 160425 MP K0481	NOT AVAILABLE
	SB	SB 25-1BGG MOD 160338 MP K30142	SB 25-1BGH MOD 160392 MP K30339	Door 2 SB 25-1BJ5 MOD 162174 MP P20412 MOD 162307 MP P20422 Door 3 SB 53-1327 MOD 162472 MP K30828 MOD 37713 MP K11582
A321 NEO ST6	PRODUCTION	As per manufacturing best practice	MOD 160425 MP K30339	NOT AVAILABLE
	SB	SB 25-1BL3 MOD 160338 MP K30142	SB 25-1BL MOD 160392 MP K30339	Door 2 SB 25-1BJ6 MOD 162174 MP P20412 MOD 162307 MP P20422 Door 3 SB 53-1392 MOD 162472 MP K30828 MOD 37713 MP K11582
A321 ACF-LR ST8	PRODUCTION	MOD 161847 MP K30009 MOD 164220 MP K32217	MOD 161847 MP K30009 MOD 164220 MP K32217	MOD 160542 MP K30545
	SB	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE


SB 25-1BGH
MOD 160425 MP K30481
SB 25-1BGG
A321
Door 3
SB 53-1327
Door 2
SB 25-1BJ5


SB 25-1BL4
MOD 160425 MP K30481
SB 25-1BL3
A321neo
Door 3
SB 53-1392
Door 2
SB 25-1BJ6



[Survey for the Engineering Support section]

Annex

General Information

Potential impact:	PAX Comfort				
Key information:	In-Service Issue				
Solution benefit:					
First issue date:	21-MAR-2016	Issue date:	01-FEB-2024	Last check date:	01-FEB-2024

Technical parameters

ATA:	21-00, 25-80, 53-20, 53-40
A/C type/serie:	A321
Engine:	
Engine manufacturer:	
Fault code/ECAM warning:	
FIN:	
Part Number:	
Supplier:	

Attachments

N/A

Links

Other articles (ISI/TFU):

- 52.10.00058

Airnav documents:

- MOD 160338, MOD 160392, MOD 160425, MOD 161796, MOD 161847, MOD 162174, MOD 162307, MOD 162472, MOD 164220, MOD 37713

- MP K11582, MP K18489, MP K30009, MP K30142, MP K30339, MP K30481, MP K30828, MP K32217, MP P20412, MP P20422
- SB 25-1BGG, SB 25-1BGH, SB 25-1BJ5, SB 25-1BJ6, SB 25-1BL3, SB 25-1BL4, SB 53-1327, SB 53-1392