ATA 21 – Air Conditioning System SA

A320 CEO/NEO

LIEBHERR

October –November 2023

A320

Agenda

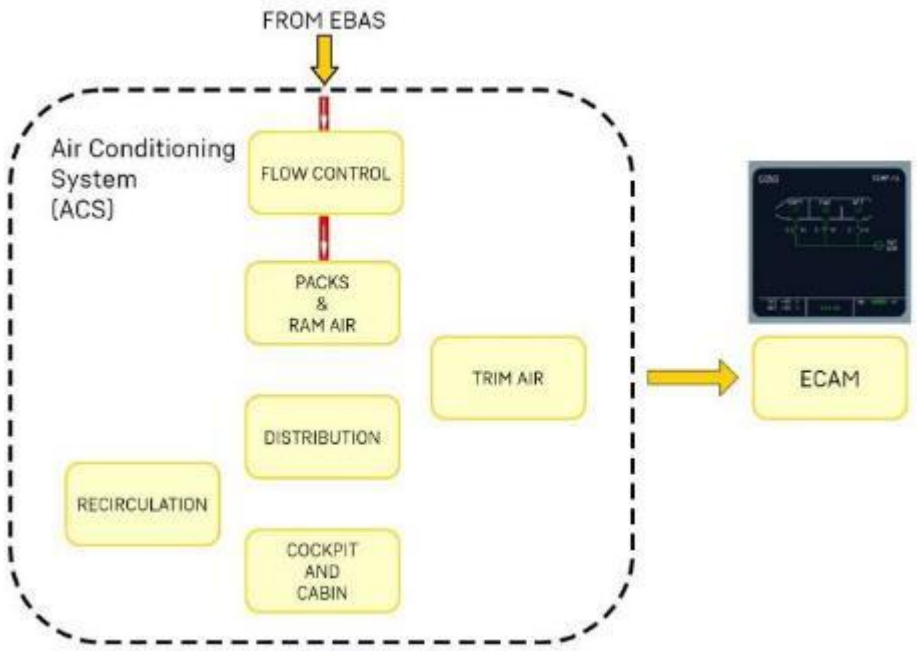
1 System Overview

2 Pack Overview

3 Trim Air System Overview

1. System Overview

- The ACS maintains and controls the temperature and ventilation required for cabin safety and comfort.
- The ACS is supplied with hot air from the Bleed Air System (BAS), APU, or external HP ground connectors.
- The air flow is controlled upstream of the Air Conditioning Units (ACUs or Cooling Packs) via regulating and shut-off valves.
- The air supplied by the Flow Control System (FCS) is cooled across the packs.
- The fresh air supplied by the packs is mixed with re-circulated air from the cabin in order to reduce engine air consumption and increase cabin air humidity.
- This cold air is mixed to hot air (Trim Air) to provide cockpit and cabin with comfortable air temperature.
- The smoke evacuation is possible when required.
- Indication to the flight crew is displayed via the Electronic Centralized Aircraft Monitor ECAM.



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3. FCV 1806D0000-02 - Actuator leakage

Issue:
Liebherr noticed in Q4 2020 an increase of FCV P/N 1806D0000-02 removals

Description:
A/C level: “AIR PACK X REGUL FAULT” associated to “PACK FLOW CTL VALVE (2XHB)” CFDS message
FCV level: external leakage high, torque motor drift

Root cause: Air leakage between actuator and valve body
FCV PNR 1806D0000-02 use unique casting for actuator and valve body, introducing an hyperstatic assembly, more sensitive to several factors (screws size and number, screw-locks sizes, soft contact surfaces, differential thermal dilatation, vibration…).

Containment plan:
Mitigation action in manufacturing process & repair shop : addition of a second torqueing task of the actuator screws to secure the tightening on a longer period than with a single torqueing.

3. FCV 1806D0000-02 - Actuator leakage

Action plan & solution

Root cause & corrective action plan launched in March 2021. Solution is to redesign the actuator body in order to avoid a hyper static assembly.

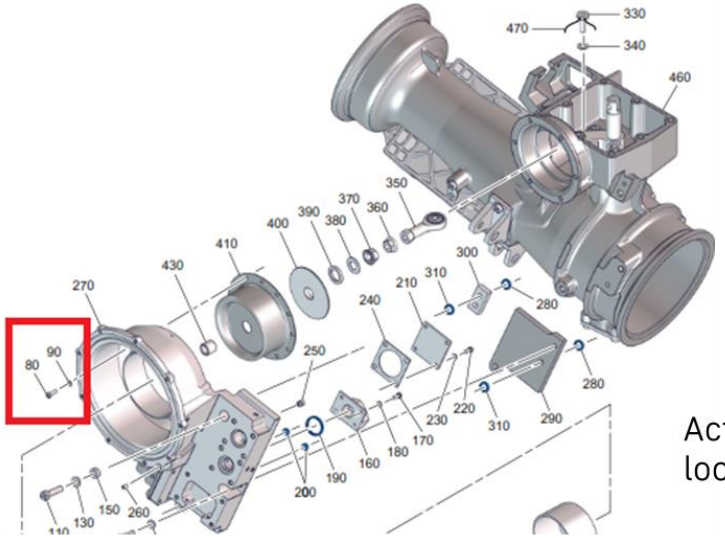
Additional Parameters

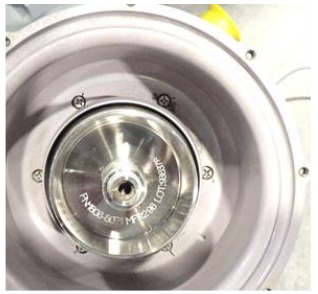
Population affected : latest FCV standard P/N 1806D0000-02 (Entry into Service in March 2019).

In-Service Strategy

New FCV under development

3. FCV 1806D0000-02 - Actuator leakage



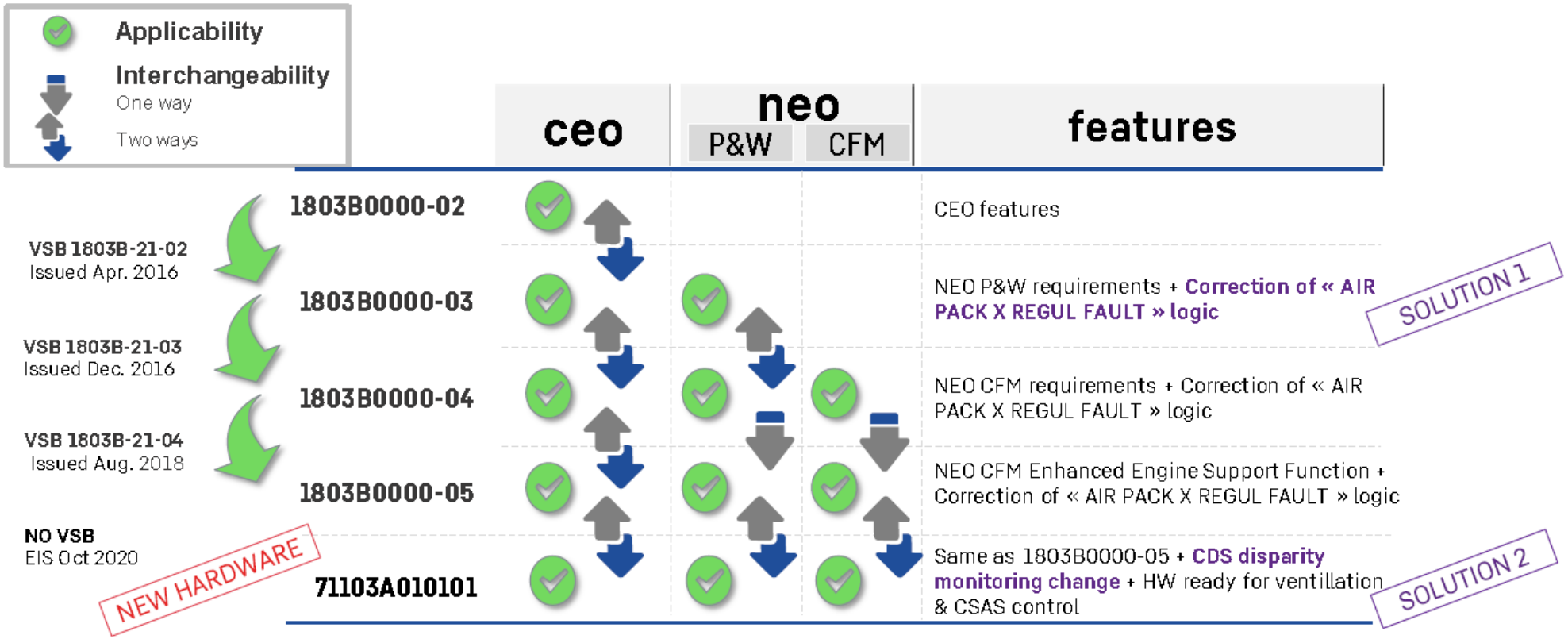


Actuator screws found loose

Air leakage visualized by dirt traces

Component consequence : lower actuator diaphragm wear found on some units

AIR PACK REGUL FAULT E/W ORPHAN INVESTIGATION



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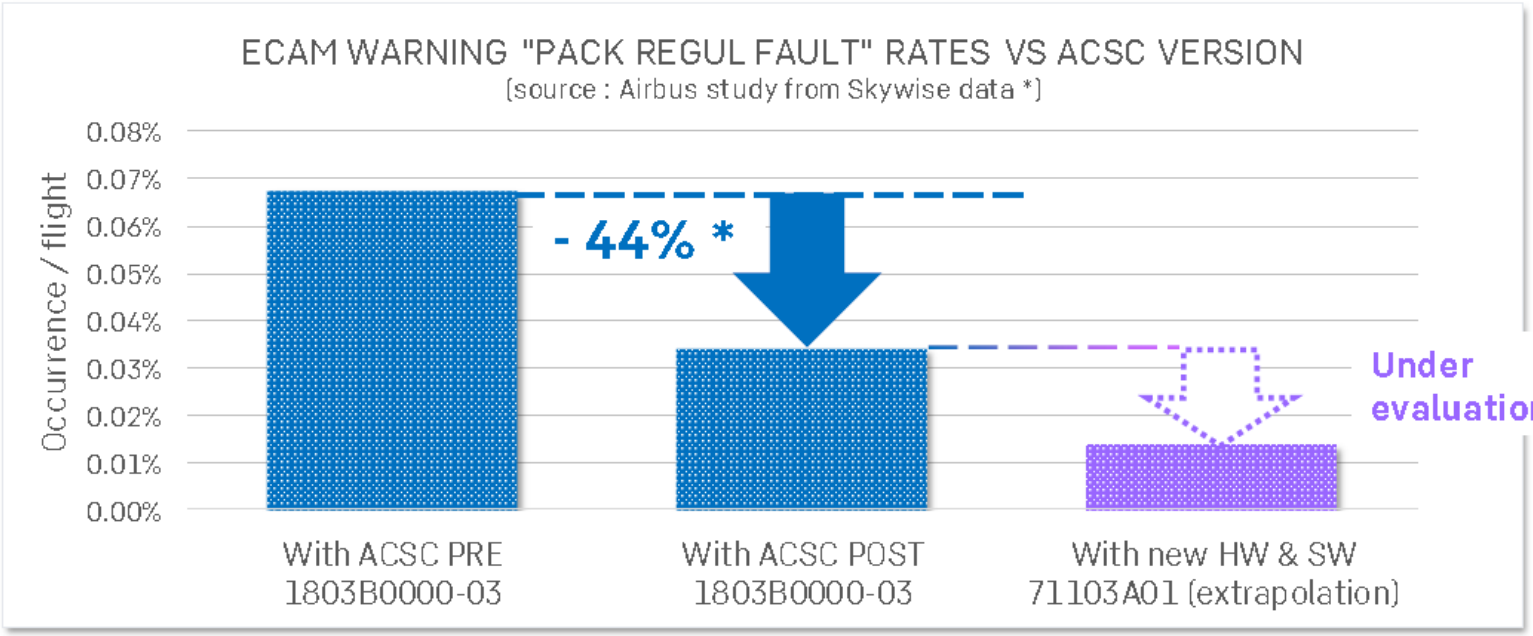
AIR PACK REGUL FAULT E/W ORPHAN INVESTIGATION

– ACSC software modification improvement measure

In June 2021, Airbus performed a comparative study in ECAMs “AIR PACK# REGUL FAULT” occurrence rate per flight between pre and post mod 1803B0000-03 software. The result is very positive, with a reduction of :



(*) : Based on A319-A320-A321 aircraft delivered from 2010 to 2019, on a total of nearly 3,500,000 flights.

/// As of today, Airbus decision is to not create a new software for 1803 Hardware.

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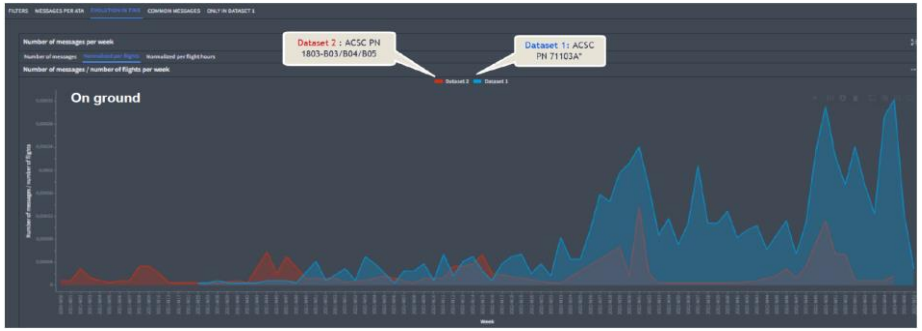
ATA 21 Air Conditioning System (ACS) SA

COND TRIM AIR SYS FAULT – A320

ISSUE

On some aircraft fitted with ASCS PN 71103A010101, an increase of message « COND TRIM AIR SYS FAULT » occurrences has been observed on Ground only.



One of the main contributor identified is the ACSC emergency mode on Ground, where TAV is no more supplied but the monitoring by ACSC software is still active.
The mismatch between the TAV command and the TAV position feedback leads to a failure message which is latched until system test or power reset.

SOLUTION

Corrective actions:

- An analysis was launched for a new ACSC software in order to inhibit the emergency mode on ground
- An investigation (Airbus MISP) has been open to identify other potential contributors and followed through the Airbus TFU 21.60.00029

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Thank you

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