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SERVICE INFORMATION LETTER

ATA SYSTEM: 21

TITLE: BOMBARDIER Challenger 300/350/3500

BLEED AIR SYSTEM AND AIR CONDITIONING PACK

**Failure of Air Cycle Machine PN 3471A020000 potentially
causing smoke/smell event**

A. Purpose

The purpose of this SIL is to gather maintenance actions and flight crew observations when an ACM failure occurs leading to smoke/smell in the cabin/cockpit.

The data obtained will be valuable in aiding our investigation and resolution of the issue.

It is imperative to know that not all ACM failures lead to smoke/smell events.

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B. Summary

In April 2022, Liebherr released VSB 3471-21-01 to introduce new and improved Thrust Bearings PN S1018A035 and S1019A035 into the ACM. This modification was identified with the letter 'A' engraved on the identification plate.

The reason for the VSB is to resolve smoke/smell entering the aircraft caused by ACM failures at thrust bearing level. Since the release of the VSB, approximately 70 ACM units post Amdt 'A' are operating in the field and over the following several months, Bombardier and Liebherr received notice that four of these units have failed prematurely, causing a smoke/smell event.

C. Effectivity

All Challenger 300/350/3500 aircraft equipped with ACM PN ACM 3471A020000 pre or post Amdt A.

D. Actions

The purpose of this SIL is to obtain maintenance actions and flight crew observations **ONLY** when an ACM failure occurs causing a smoke/smell event. The data obtained will be valuable in our investigation and resolution of the issue.

1. Flight Crew: Observations when smoke/smell occurred:

- a) Did the amber **PACK TEMP HI** CAS message appear before or after the smoke/smell event or not at all?
- b) Did any other CAS message appear? If so, record the description and color of CAS message.
- c) Did the smoke/smell event occur during ground idle, taxi, take off, climb, cruise, descent, after landing, or other?
- d) Did the smoke/smell event occur while using the APU or engines as the source of bleed air for the air conditioning system?
- e) Did the smoke/smell event occur soon after switching the source of bleed air from APU to engines or vice-versa?
- f) From ECS Synoptic page, what was the pressure shown on the intermediate bleed air pressure manifold?

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2. Flight Crew: General Operation of Bleed Air Sourcing

During ground operation:

- a) What is the typical length of time the APU operates as the source of bleed air before switching to engines?
- b) What is the aircraft operating condition when switching from APU to engines?
 - After main engine start
 - At gate prior to departure
 - During taxi out
 - During take-off
 - In flight

In flight:

- a) What is the aircraft operating condition when switching from engines to APU as the source bleed air for the purpose of air conditioning?
 - On approach
 - After landing/during taxi
 - Before engine shutdown/before passenger unboarding

3. Maintenance Crew: Actions following smoke/smell event

- a) Rotate the ACM, using light finger pressure, to determine if seized. No resistance should be felt with the rotation.

CAUTION: THE ROTATION HAS TO BE CONTERCLOCKWISE WHEN LOOKING FROM OUTSIDE TO THE FAN, AND LESS THAN HALF A REVOLUTION.

- b) Take detailed pictures showing the core of the dual heat exchanger PN GG670-95008-3, the precooler PN 3737A020000 and the reheater/condenser PN 3739A010000. Send the pictures to Liebherr and include the TSI (Time Since Installation) for each component. These pictures will be used for study purposes only.
- c) Download the IASC No. 1 data from the Maintenance Diagnostic Computer (MDC) and send data to Liebherr for analysis. Refer to AMM Task 45-45-01-970-802.
- d) If necessary, you may consult with Liebherr Technical Support for assistance and troubleshooting actions.

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4. Maintenance Crew: General

- a) Identify the country/airport of the aircraft Base Location.
- b) Is the Base Location in an area known for high levels of humidity and pollution?
- c) Is the aircraft commonly parked in a hangar or outside?

E. Contact Information

The Liebherr Aerospace Technical Support team can be contacted for additional information on this SIL.

Please fill in the "In-Service Event Report" below and send it to:

Liebherr Technical Support

Telephone: +33(0)5 61.35.28.65 (Toll Free U.S.A./Canada/E.U.)

email: technical.services@liebherr.com

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IN-SERVICE EVENT REPORT - smoke/smell event

Aim of this document	In order to get more conclusive analysis, we would like to get a detailed feedback for each occurrences of smoke/smell events
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Date :	MSN :	Country/airport of the aircraft Base Location:
QUESTIONS		ANSWERS
General	Is the Base Location in an area known for high levels of humidity and pollution?	
	Is the aircraft commonly parked in a hangar or outside?	
Observations when smoke/smell occurred	Did the amber PACK TEMP HI CAS message appear before or after the smoke/smell event or not at all ?	
	Did any other CAS message appear ?	
	Did the smoke/smell event occur during ground idle, taxi, take off, climb, cruise, descent, after landing, or other?	
	Did the smoke/smell event occur while using the APU or engines as the source of bleed air for the air conditioning system?	
	Did the smoke/smell event occur soon after switching the source of bleed air from APU to engines or vice-versa ?	
	From ECS Synoptic page, what was the pressure shown on the intermediate bleed air pressure manifold ?	
General Operation of Bleed Air Sourcing	What is the typical length of time the APU operates as the source of bleed air before switching to engines ?	
	What is the aircraft operating condition when switching from APU to engines?	
	What is the aircraft operating condition when switching from engines to APU as the source bleed air for the purpose of air conditioning	