

## A320neo family - Engine Interface Unit (EIU) system issues

Reference: 73.25.00023

Issue date: 11-MAR-2022

Last check date: 11-MAR-2022

Status: Open

A/C type/serie: A319-100N, A320-200N, A321-200N, A321-200NX, A321-200NY

ATA: 73-25

Engine manufacturer:

Supplier: IEC ELECTRONIQUE, ...

Purpose / Reason for revision: To publish

 Engineering Support

Status: Open

**Description / Operational Impact**

Operators have reported issues related to the A320neo family EIU system. Most commonly:

**Issue 1:** Spurious ECAM alert: ENG 1(2) EIU FAULT occurring just after engine start and linked to the Engine mode rotary selector faults 007/008.

Reported only on PW1100G-JM engines.

**Issue 2:** ECAM alert: ENG 1(2) EIU FAULT occurring on ground before engine start, with no associated EIU fault message, and inability to access the EIU interactive mode through MCDU.

**Issue 3:** High rates of EIU units NFF.

These events have led to operational interruption in order to carry out troubleshooting and parts replacements.

**Root Cause / Investigation**

- The investigation into issue 1 and issue 2 is ongoing with SAFRAN.
- It is believed that issue 1 and issue 2 are directly contributing to the high rate of NFF, issue 3.

**Mitigation / Interim Action**

Issue 1: For ENG 1(2) EIU FAULT which occurs just after engine start: and linked to the Engine mode rotary selector faults 007/008:

**Flight operations:**

- Apply engine mode rotary selector reset procedure, as described in AIRBUS FOT 999.0014/22

**Maintenance:**

- Strictly apply the TSM TASK Ref 1/ or Ref 2/ (as applicable) and if the fault cannot be confirmed the aircraft should be released to service and monitored to see if the fault returns.

Note: As per standard Airbus troubleshooting philosophy, if fault returns in subsequent flights continue with the applicable TSM TASK Ref 1/ or Ref 2/.

Issue 2: For ENG 1(2) EIU FAULT which occurs without any associated EIU fault message, and with inability to access the EIU System report test page:

- Apply TSM TASK Ref 3, 4, 5 or 6 (as applicable). If the fault is not confirmed and functionality of the EIU is restored, monitor the aircraft to see if the fault returns.

**Terminating Action**

- To be determined based on results of the root cause investigation.

**Applicability:**

A320neo family aircraft fitted with either PW1100G-JM or LEAP-1A engines.

## **References:**

- 1) TSM TASK 73-25-00-810-A24-A - CRANK/NORM/IGN Selector Fault on EIU-1 (PW)
- 2) TSM TASK 73-25-00-810-A25-A - CRANK/NORM/IGN Selector Fault on EIU-2 (PW)
- 3) TSM TASK 73-25-01-810-845-A - No EIU 1 Response on MCDU Screen at Entry in Interactive Mode (PW)
- 4) TSM TASK 73-25-01-810-846-A - No EIU 2 Response on MCDU Screen at Entry in Interactive Mode (PW)
- 5) TSM TASK 73-25-01-810-848-A - No EIU 1 Response on MCDU Screen at Entry in Interactive Mode (CFM)
- 6) TSM TASK 73-25-01-810-849-A - No EIU 2 Response on MCDU Screen at Entry in Interactive Mode (CFM)
- 7) AMM TASK 73-25-34-400-802-A - Installation of the Engine Interface Unit (EIU) (PW)
- 1) AMM TASK 73-25-34-400-803-A - Installation of the Engine Interface Unit (EIU) (CFM)

## **Background:**

Operators have reported the following issues related to the A320neo family EIU system:

### **Issue 1:**

ECAM alert: ENG 1 EIU FAULT, or ENG 2 EIU FAULT associated with Engine mode rotary selector fault code 007 or 008. (PW only)

PW operators report these events occur just after engine start, and frequently result in operational interruption in order to troubleshoot the fault.

During troubleshooting of fault messages "EIU1-007-ENGINE STARTFAULT" or "EIU2-008-ENGINE STARTFAULT" it is reportedly not possible to confirm the fault. In many cases even if the fault is not confirmed operators report replacement of either the EIU, the engine mode selector switch (6KS) or both.

If the fault is not confirmed and the aircraft is released to service with no parts replacements, operators report that the fault does not return.

EIU units removed due to this fault are found NFF at the supplier.

Engine mode selector switches (6KS) are not repairable and are normally scrapped.

### **Issue 2:**

ECAM alert: ENG 1(2) EIU FAULT, with no associated EIU fault message with inability to access the EIU interactive mode through the MCDU: (All A320neo motorisations)

Operators report that there is no EIU fault message present, and that they are unable to access the EIU interactive mode through the MCDU.

Operators report that after carrying out a circuit breaker reset of the EIU, full functionality of the EIU is restored.

EIU units removed due to this fault are mostly found NFF at the supplier.

### **Issue 3:**

#### **High rates of EIU units NFF: (All A320neo motorisations)**

It is believed that the Issue 1 and Issue 2 reported above are directly contributing to a high rate of EIU NFF.

Some EIU units are removed directly after installation (nil hour removal), due to the customer noting there is no software installed.

### **Root Cause Investigation**

The investigation into issue 1 and issue 2 is ongoing.

### **Mitigation Actions:**

#### **Issue 1:**

ECAM alert: ENG 1 EIU FAULT, or ENG 2 EIU FAULT after engine start, with Engine mode rotary selector fault 007 or 008.

**Maintenance:** Strictly apply the TSM TASK Ref 1/ or Ref 2/ (as applicable) and if the fault cannot be confirmed the aircraft should be released to service and monitored to see if the fault returns.

**Flight operations:** Apply engine mode rotary selector reset procedure, as described in AIRBUS FOT 999.0014/22.

**Note:** As per standard Airbus troubleshooting philosophy, if fault returns in subsequent flights continue with the applicable TSM TASK Ref 1/ or Ref 2/.

#### **Issue 2:**

ECAM alert: ENG 1(2) EIU FAULT, with no associated EIU fault message, with inability to access the EIU interactive mode through the MCDU.

**Maintenance:** Apply first the TSM TASK Ref 3, 4, 5 or 6 (as applicable). If the fault is not confirmed and functionality of the EIU is restored, the aircraft should be monitored to see if the fault returns.

### **Issue 3:**

High rates of EIU units NFF:

The mitigation actions proposed for issue 1 and issue 2 will help to reduce the NFF on the EIU.

Regarding the removal of EIU units which have been delivered to customers with no software installed, depending on the type of EIU repair it can be completely normal that the EIU is delivered without software. The AMM task for EIU installation has been updated in order to clarify that it is the operator's responsibility to upload the software in case of EIU delivered without software.

**Maintenance:** Ref 7/ and Ref 8/ AMM task for EIU installation updated (Nov 2021) to inform operators:

NOTE: *If the installed EIU is new or returned from the shop, there is a risk that no software is uploaded.*

(1) *Do a check of the EIU software Ref. AMM TASK 73-25-34-860-805.*

*(a) If EIU 1(2) does not respond when you select it on the Multipurpose Control & Display Unit (MCDU) screen:*

*1 Upload the EIU software Ref. AMM TASK 73-25-34-860-805.*

### **Final Solution / Recommendation:**

- To be determined based on results of the root cause investigation.

### **Additional Note:**

None.

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance, Operational Reliability		
Key information:			
Solution benefit:			
First issue date:	30-NOV-2021	Issue date:	11-MAR-2022
Last check date:	11-MAR-2022		

## Technical parameters

ATA:	73-25
A/C type/serie:	A319-100N, A320-200N, A321-200N, A321-200NX, A321-200NY
Engine:	
Engine manufacturer:	
Fault code/ECAM warning:	
FIN:	1KS1, 1KS2, 6KS
Part Number:	058-001-00, 777461-1-1
Supplier:	IEC ELECTRONIQUE, SAFRAN AEROSYSTEMS, SAFRAN AEROTECHNICS

## Attachments

N/A

## Links

N/A

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## LEAP-1A - Engine Stall related to Intermediate Pressure Check Valve (IPCV)

Reference: 36.11.00112

Issue date: 21-JAN-2022

Last check date: 21-JAN-2022

Status: Open

A/C type/serie: A319-100N, A320-200N, A321-200N, A321-200NX

ATA: 36-11, 72-00

Engine manufacturer: CFMI

Supplier: SAFRAN NACELLES, ...

Purpose / Reason for revision: TFU update

 Engineering Support

WE HAVE THIS P/N FITTED IN OUR FLEET ENGINES- CRITICAL!

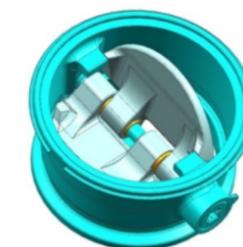
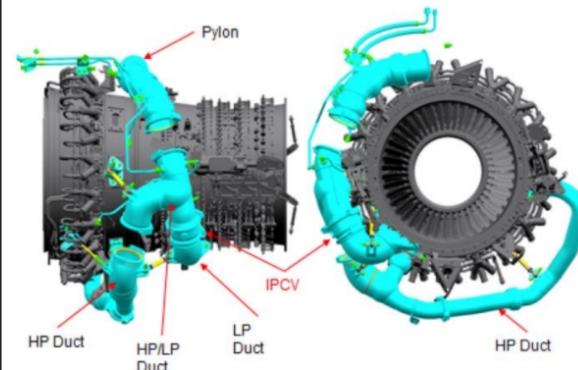
Status: Open

**Description / Operational Impact**

- **9 events of "ENG 1(2) STALL" ECAM Alerts reported during end of climb or beginning of descent (details in the table below)**
- For all events, the affected engine thrust was recovered after the stall
- **7 IPCVs P/N ER8040G01 (Pre MOD) and 2 IPCV P/N ER18000G01 (Post MOD) were found either stuck open (flappers hard to move) during subsequent troubleshooting or damaged beyond allowable limits during engine inspection**

**Root Cause / Investigation**

- Bushings migration identified as contributor
- Root cause of bushing migration still under investigation between Airbus, CFM, Safran Nacelles and MRAS
- **Tests performed up to now did not reproduce the bushings migration or flappers stuck open**
- **Further tests on-going**

**Mitigation / Interim Action**

- VSB BD70CR36-032 and BD70CR36-035 still recommended
- New inspection VSB BD70CR36-049 (to supersede VSB BD70CR36-032) **on-hold, pending investigation findings**

**Final fix**

- N/A

**References:**

VSB BD70CR36-032

VSB BD70CR36-035

AMM Task 36-11-41-200-803-A

## **Background:**

### **Issue 1:**

In 2018, some operators reported to have found internal wear on IPCV P/N ER8040G01 during C-check inspections.

No operational interruption was reported due to these events.

Safran Nacelles received reports of 149 IPCV removals as of MAR-2021.

### **Issue 2:**

**9** events of "ENG 1(2) STALL" ECAM Warning reported during Climb, Cruise or Descent (details in the table below). For all those events, the affected engine thrust was recovered after the stall.

**7** IPCVs P/N ER8040G01 (Pre MOD) and **2** IPCV P/N ER18000G01 (Post MOD) were found either stuck open (flappers hard to move) during subsequent troubleshooting or damaged beyond allowable limits during engine inspection.

## **Description / Investigation:**

### **Issue 1:**

Safran Nacelles investigations showed that those failures were due to a premature wear of internal bushings and door stops deformation. The valves showed signs of wear and deformation beyond acceptable limits.



Issue 2:

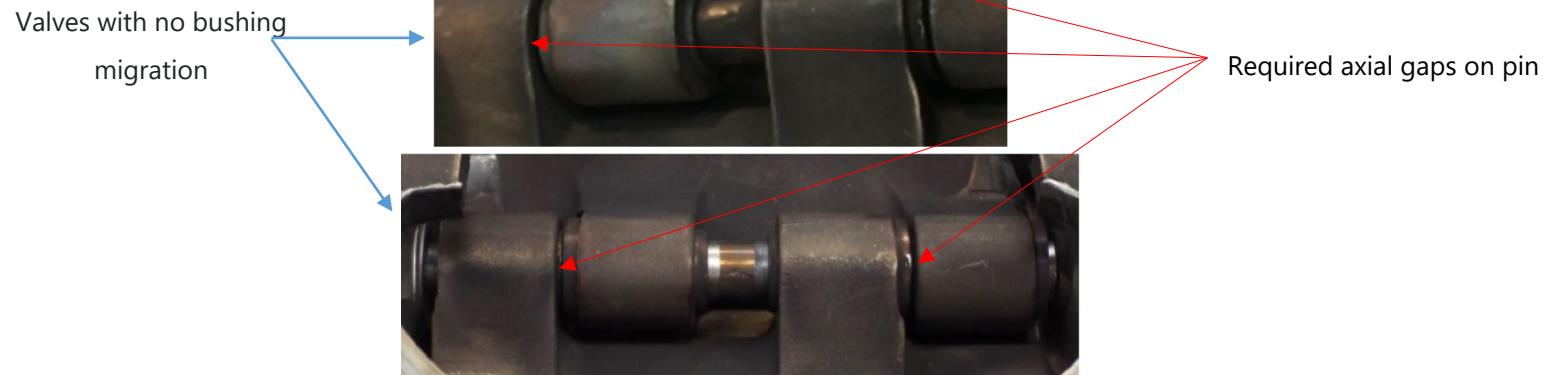
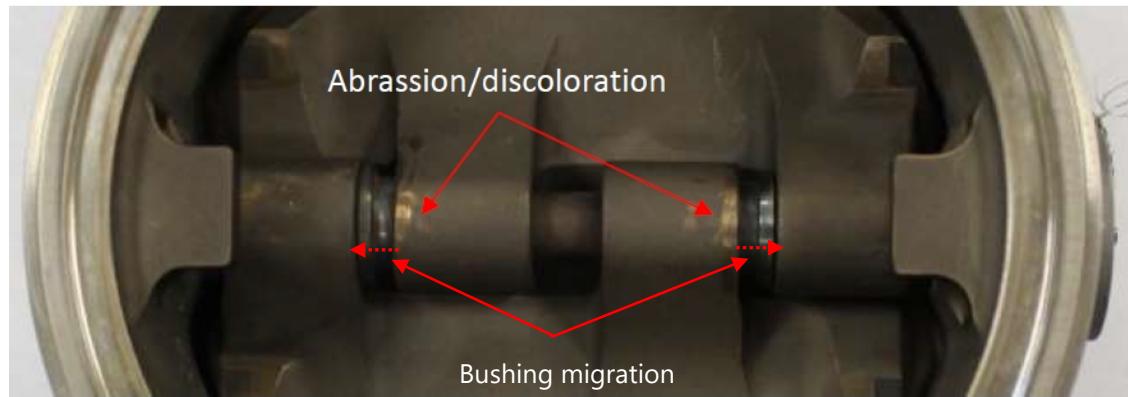
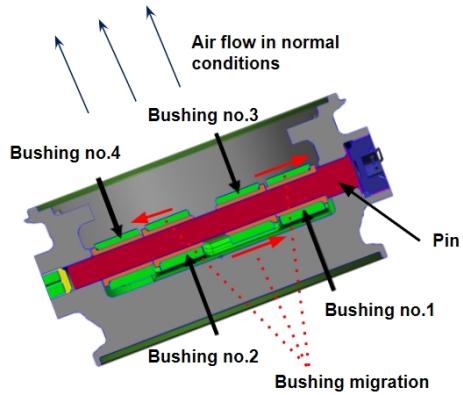
The removed IPCVs have been sent to Safran Nacelles for investigation.

No.	Date of Event	Event	Operational Impact	ESN	IPCV P/N	IPCV TSN	IPCV CSN	Findings	Bushings migrated
1	FEB-2020	ENG 2 STALL in Cruise	IFTB + AOG	598520	ER8040G01	4122	1023	wear beyond allowable	Y (#1)
2	DEC-2020	ENG 2 STALL in Cruise	AOG	599265	ER8040G01	3158	1220	flappers hard to move	Y (#2 and #3)
3	MAY-2021	ENG 1 STALL in Climb	Diversion + AOG	598903	ER8040G01	6879	3674	wear beyond allowable	Y (#2 and #3)
4	JUN-2021	ENG 1 STALL in Cruise	AOG	599606	ER18000G01	3094	1781	flappers hard to move	Y (#2 and #3)
5	JUN-2021	ENG 2 STALL in Climb	IFTB + AOG	599018	ER8040G01	6862	3502	flappers hard to move	Y (#2 and #3)
6	AUG-2021	ENG 1 STALL in Descent	AOG	598204	ER8040G01	6694	3611	flappers hard to move	Y (#1, #2 and #3)
7	AUG-2021	ENG 1 STALL in Cruise	AOG	599131	ER8040G01	6808	3449	flappers hard to move	TBC
8	NOV-2021	ENG 2 STALL in Descent	AOG	598332	ER8040G01	9242	4509	flappers hard to move	TBC
9	JAN-2022	ENG 2 STALL in Climb	IFTB + Delay	599073	ER18000G01	1556	606	flappers hard to move	TBC

Detailed inspections showed a **migration of bushings no.1, 2 or 3**, with the pin not able to slide and the required axial gap on the pin reduced to null. This scenario can lead to the valve being stuck open, when combined with high temperature (thermal expansion on the pin axis).

The root cause analysis for bushing migration is on-going between Airbus, CFM, Safran Nacelles and MRAS. Multiple tests launched (ECS flow, vibration, thermal, engine integration) in order to determine the contributors of the bushing migration phenomenon.

**However, the bushings migration or flappers stuck open were not reproduced by the tests already performed. Further tests on-going.**



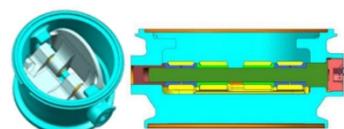
## Mitigation / Intermediate Action:

### Issue 1:

Safran Nacelles issued VSB BD70CR36-032 in 2018 to inspect the IPCV every C-check in order to identify any premature wear, and replace the valve if necessary.

Then, a new IPCV P/N ER18000G01 (MOD 166237) was introduced with the following improvements:

- New materials
- Bushing to Bushing surface area increased
- Surface of door stop increased



This new IPCV was introduced in production on MSN 9585 as PoE, and in-service with VSB BD70CR36-035 released in MAR-2020 (which cancels the repetitive inspections of VSB BD70CR36-032).

Therefore, Airbus recommends to perform IPCV inspection per VSB BD70CR36-032 every C-check and in case of findings, replace the valve per VSB BD70CR36-035.

Issue 2:

New inspection VSB BD70CR36-049 (superseding VSB BD70CR36-032) **on-hold, pending investigation findings**.

AMM Task 36-11-41-200-803-A will also be updated to match the new inspection.

**Final fix:**

N/A (pending investigation results)

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance, Operational Reliability		
Key information:	In-Service Issue, Linked Items - Service Bulletin		
Solution benefit:			
First issue date:	10-FEB-2021	Issue date:	21-JAN-2022
Last check date:	21-JAN-2022		

## Technical parameters

ATA:	36-11, 72-00
A/C type/serie:	A319-100N, A320-200N, A321-200N, A321-200NX
Engine:	LEAP-1A23, LEAP-1A24, LEAP-1A26, LEAP-1A29, LEAP-1A30, LEAP-1A32, LEAP-1A33
Engine manufacturer:	CFMI
Fault code/ECAM warning:	ENG 1 STALL, ENG 2 STALL
FIN:	7110HM1, 7110HM2
Part Number:	ER18000G01, ER8040G01
Supplier:	SAFRAN NACELLES, SAFRAN NACELLES, SAFRAN NACELLES

## Attachments

N/A

## Links

### Airnav documents:

- VSB BD70CR36-032, VSB BD70CR36-032, VSB BD70CR36-032, VSB BD70CR36-035

### FAIR-ISP:

- 21.0024

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## A320FAM neo LEAP - E/W Air Pack Regul Fault wtih F/M EIU FLOW DMD INCONSISTENCY

Reference: 21.52.00058

Issue date: 11-JAN-2022

Last check date: 11-JAN-2022

Status: Open

A/C type/serie: A320

ATA: 21-52

Engine manufacturer:

Supplier: LIEBHERR AEROSPACE TOULOUSE SAS

Purpose / Reason for revision: bvaehomrptùnhr

 Engineering Support

Status: Open

**Applicability:**

A320neo FAM aircraft fitted with:

- CFM LEAP-1A engines
- EIU SW 4.0 and subsequent
- ACSC PN 1803B0000-05 and subsequent
- FWC H2-F9/ H2-F10

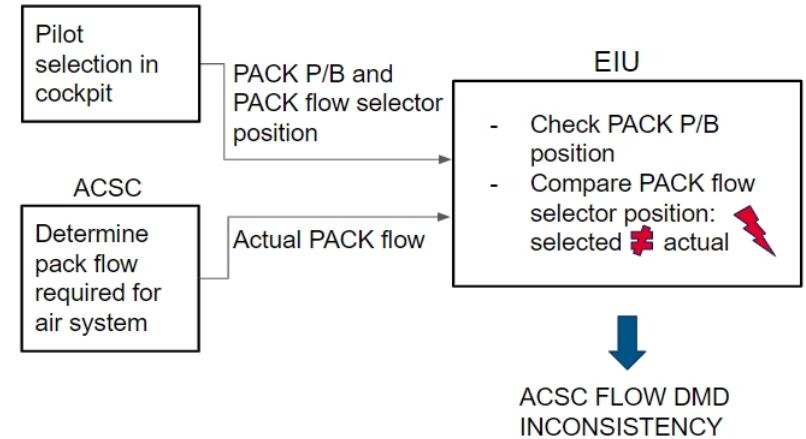
**References:****TSM TASK 73-25-01-810-833-A** - ACSC1 Flow DMD Inconsistency on EIU-1**TASK 73-25-01-810-834-A** - ACSC2 Flow DMD Inconsistency on EIU-2**Background:**

In case the EIU detects an inconsistency between the actual and expected bleed air flows extracted from the engine, the below Fault Message **might be triggered**:

- **EIU1-185-ACSC 1 FLOW DMDINCONSISTENCY/ EIU2-186-ACSC 2 FLOW DMDINCONSISTENCY**
- when FWC H2-F10 is installed: the fault message is associated with the triggering of ECAM WARNING **AIR PACK 1/2 REGUL FAULT**). This function was introduced in order to **protect the CFM LEAP-1A engines in idle (PH02)**.

## EIU trigger logic on A320 neo:

- The EIU calculates the bleed decrements i.e. the quantity of bleed air that has to be extracted from the engines to feed the bleed system
- The EIU determines the decrements based on the position of the controls in the cockpit and NOT based on the actual valve position.
- The EIU generates the fault message when the data received from the ACSC is not consistent with the pilot selection.



## Issue:

Airbus received several reports of EIUX-18x-ACSCx FLOW DEMAND INCONSISTENCY **when the opposite bleed side failed and became inoperative.**

After investigation, "EIUX-18y-ACSCx FLOW DEMAND INCONSISTENCY" could be disregarded in case:

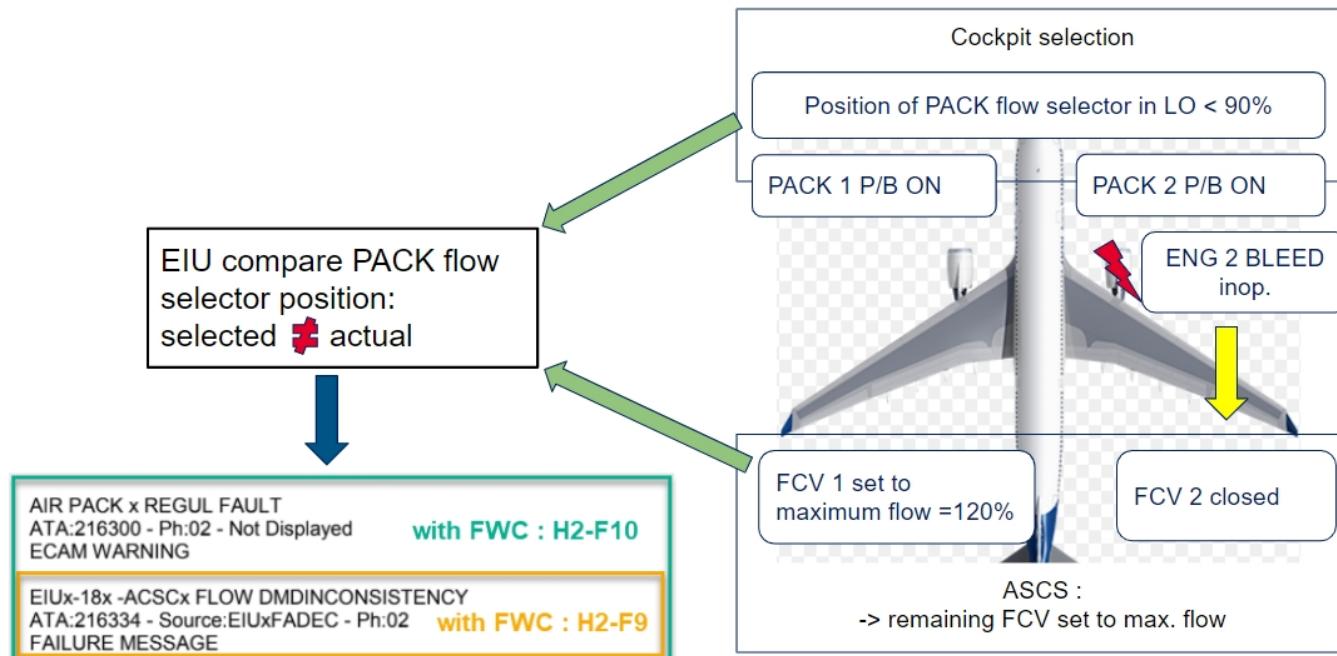
- No other ATA 21 fault recorded in the PFR
- There is a bleed fault (ATA 36) on the opposite side

## Example - Scenario:

Bleed 2 is failed leading to bleed 2 loss, the FCV 2 will close as no bleed air is available.

=> ACSC logic detects the closed FCV 2 and **sets the flow demand to 120%.**

=> The EIU detects a discrepancy between the **selected** and **actual** flows. Hence inconsistency in flow demand failure could be triggered.



Note: On ground with both engines running normal flow < 90%

## Mitigation:

Should you experience these fault messages on aircraft in the above mentioned configuration and if the PFR contains bleed faults on the opposite side at the same time, the EIUX-18y-ACSCx FLOW DEMAND INCONSISTENCY fault message can be disregarded, provided that the bleed fault on the opposite bleed side is troubleshooted as per TSM.

This will be documented in ISI 00.00.00228.

## Solution:

**TSM TASK 73-25-01-810-833-A / TASK 73-25-01-810-834-A update** is launched in order to request to check the opposite side for bleed faults and troubleshoot accordingly. This is planned to be available in **Airnav rev. May 2022**.

Survey for the Engineering Support section



## General Information

Potential impact:	Maintenance		
Key information:			
Solution benefit:			
First issue date:	11-JAN-2022	Issue date:	11-JAN-2022
Last check date:	11-JAN-2022		

## Technical parameters

ATA:	21-52
A/C type/serie:	A320
Engine:	
Engine manufacturer:	
Fault code/ECAM warning:	
FIN:	47HH/57HH
Part Number:	1803B0000-05, 71103A010101
Supplier:	LIEBHERR AEROSPACE TOULOUSE SAS

## Attachments

N/A

## Links

N/A

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## LEAP-1A - Engine Fire Detection Harness damage

Reference: 26.12.00024

Issue date: 31-DEC-2021

Last check date: 28-FEB-2022

Status: Open

A/C type/serie: A319-100N, A320-200N, A321-200N, A321-200NX

ATA: 26-12, 71-02, 71-40, ...

Engine manufacturer: CFMI

Supplier: SAFRAN NACELLES, ...

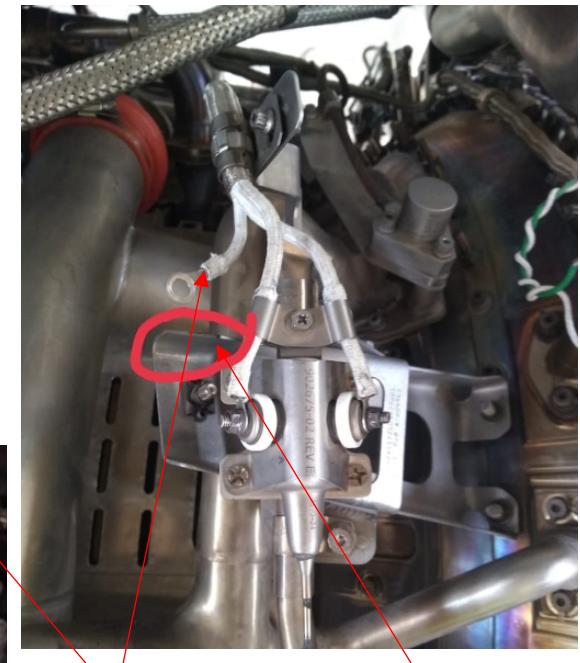
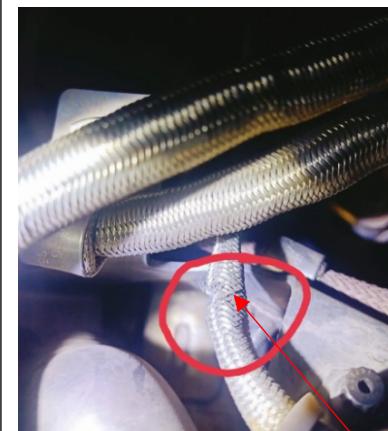
Purpose / Reason for revision: Information check

 Engineering Support

Status: Open

**Description / Operational Impact**

- Operators reported damages on Harness P/N 515175-2 of two types:
  - At the interface with engine support bracket P/N 2609M77G01 (sometimes with reports of broken bracket)
  - At locations where the gap with other engine harnesses is minimal (e.g. Turbine Center Frame harness)
- Some events were found during routine inspection or in shop
- Other events were found following ECAM Alert "ENG 1(2) FIRE LOOP A(B) FAULT" (in case the Harness is disconnected from the ground and the engine experiences a lightning strike)
- No proactive protection of this Harness is allowed (e.g. with fiberglass tape) as it represents a configuration change and has to be covered by a MOD (not currently considered)



Broken support bracket

Harness damaged

Support bracket not damaged

**Root Cause / Investigation**

- Investigations with a fit check allowed to identify the following contributors:
  - Chafing with the support bracket which is subject to engine vibration (and breaks due to High Cycle Fatigue)
  - Chafing with other engine harnesses due to low gap

**Mitigation / Interim Action**

- Dispatch per MMEL 26-12 in case of ECAM Alert "ENG 1(2) FIRE LOOP A(B) FAULT" without troubleshooting
- For Harness P/N 515175-2, Allowable Damage Limits available in AMM Task 71-52-43-210-801-A and repairs in CMM 71-02-02
- If damages are beyond CMM repair limits, one-off repairs can be reviewed by Safran Nacelles on case by case basis
- For the broken support bracket, CFM has to be contacted for dispositions

**Final Fix**

- New design of the engine support bracket available per CFM VSB 72-0397 since NOV-2020
- New design of the Harness under review, consisting in rerouting the Harness and changing the interface with the support bracket

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance		
Key information:	In-Service Issue		
Solution benefit:			
First issue date:	05-JUL-2021	Issue date:	31-DEC-2021
		Last check date:	28-FEB-2022

## Technical parameters

ATA:	26-12, 71-02, 71-40, 71-52
A/C type/serie:	A319-100N, A320-200N, A321-200N, A321-200NX
Engine:	LEAP-1A23, LEAP-1A24, LEAP-1A26, LEAP-1A29, LEAP-1A30, LEAP-1A32, LEAP-1A33
Engine manufacturer:	CFMI
Fault code/ECAM warning:	ENG 1 FIRE LOOP A FAULT, ENG 1 FIRE LOOP B FAULT, ENG 2 FIRE LOOP A FAULT, ENG 2 FIRE LOOP B FAULT
FIN:	4204KS1, 4204KS2
Part Number:	515175-2
Supplier:	SAFRAN NACELLES, SAFRAN NACELLES, SAFRAN NACELLES, SAFRAN NACELLES, SAFRAN NACELLES

## Attachments

N/A

## Links

N/A

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## LEAP-1A - FUEL NOZZLES COKING (PILOT)

Reference: 73.13.00.046

Issue date: 10-FEB-2022

Last check date: 10-FEB-2022

Status: Open

A/C type/serie: A320

Engine manufacturer: CFMI

Purpose / Reason for revision: Updated mitigations and final solution

ATA: 73-13

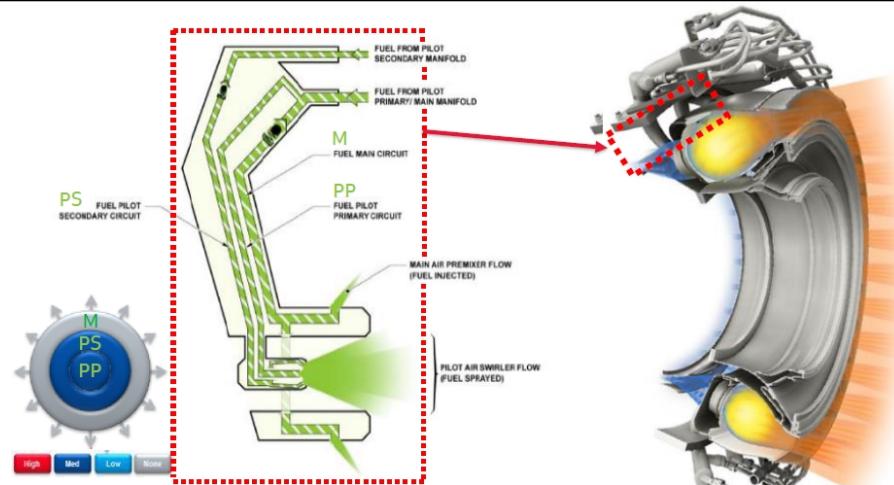
Supplier: CFM INTERNATIONAL INC

 Engineering Support

Status: Open

**Description / Operational Impact**

- Flow restrictions in the pilot circuit leading to different potential system impacts.
- Coking in the pilot flow circuit confirmed source of flow restriction.
- Reduction in flow in the pilot circuit more noticeable on top half of engine.
- Pilot circuit coking may result in:
  - Engine starting issues (hung starts).
  - Increased back pressure at the fuel pump – activation of pump relief mode and possible engine stalls.
- In addition, coking may affect the internal valves of the nozzles.
  - This may lead to hot streaks and severe turbine thermal distress.

**Root Cause / Investigation**

- Cut-up of removed nozzles confirmed blockage of pilot metering orifices.
- Residues confirmed to be coke with elevated levels of sodium and sulphur.
- Coking due to unpurged fuel after shutdown
  - Linked to heat rejected by engine parts during the soak back.

**Mitigation / Interim Action**

- CFM on-wing analytics to trigger CNR for full nozzle set replacement.
- Hard thresholds for fuel nozzle replacement depending on Region (see CFM VSB 73-0040 Issue 4).
- FADEC SW upgrade to FCS7.0 recommended for improved monitoring and maximum nozzle life.

- **New improved AMM tasks 73-11-30-000/400-803-A for full nozzle set replacement (already available in AirnavX).**
- **Video training (best practices) available on MyCFM portal.**
- **Please refer also to Airbus OIT 999.0062/20.**

#### **Terminating Action**

- **New Reverse Bleed System (RBS) to abate soak back temperatures (expected Q1 2023).**

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance, Operational Reliability		
Key information:	In-Service Issue		
Solution benefit:			
First issue date:	01-JUN-2018	Issue date:	10-FEB-2022
Last check date:	10-FEB-2022		

## Technical parameters

ATA:	73-13
A/C type/serie:	A320
Engine:	LEAP-1A24, LEAP-1A26, LEAP-1A30, LEAP-1A32, LEAP-1A33
Engine manufacturer:	CFMI
Fault code/ECAM warning:	
FIN:	
Part Number:	
Supplier:	CFM INTERNATIONAL INC

## Attachments

N/A

## Links

### Other articles (ISI/TFU):

- 73.13.00.045, 73.13.00.045

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## LEAP-1A - Starter Air Valve Issues (P04 and P05 standard)

Reference: 80.11.00.025

Issue date: 14-AUG-2020

Last check date: 14-AUG-2020

Status: Open

A/C type/serie: A320

ATA: 80-11

Engine manufacturer: CFMI

Supplier: CFM INTERNATIONAL INC, ...

Purpose / Reason for revision: Status updated - P05 retrofit no longer recommended

Resolution Timeline:

Open

Root Cause

Solution Selected

Mitigation Available

Solution Available

JUN-2020

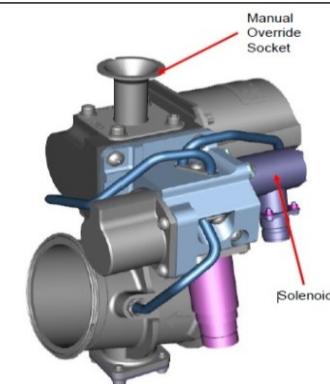
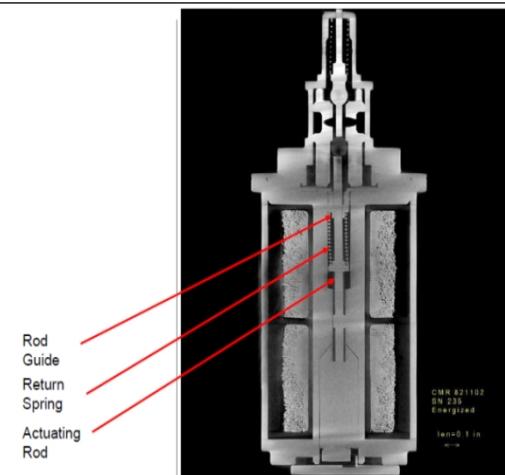
MISP

 Engineering Support

Status: Open

**Description / Operational Impact**

- Operators report numerous cases of failed engine starts due to SAV issues (top OI driver for the LEAP fleet).
- Affected SAV standards: P04 (VSB 80-0003) and P05 (VSB 80-0007).
- SAV typically fails closed or partially open, with the following effects:
  - E/W "ENG X START VALVE FAULT / START VALVE NOT OPEN" associated to "ENGXD-0353-SAV POS(CLOSED)".
  - E/W "ENG X START FAULT / STARTER SHAFT SHEAR" associated to "ENGXD-0357-STARTER SHAFT SHEAR".
- SAV issues have also been linked to fluctuations of the bleed supply and to engine start stalls.
- P04 SAV mostly fail closed (FC 0353) whereas P05 SAV tend to fail in the partially open position (FC 0357).

**Root Cause / Investigation**

- Investigation showed that P04 and P05 are affected by different

**Mitigation / Interim Action**

- For SAV failed in the closed position:

<ul style="list-style-type: none"> <li>- P04 failures are due to a mechanical binding/sticking of the piston rod within the piston guide.</li> <li>- P05 failures are due to early wear of the rod / armature interface.</li> </ul>	<ul style="list-style-type: none"> <li>- Consider additional start attempts (up to 5 times) as per FCOM procedure PRO-ABN-ENG-D ENG 1(2) START VALVE FAULT / START VALVE NOT OPEN.</li> <li>- SAV manual override as per PRO-NOR-SUP-ENG ENGINE START VALVE MANUAL OPERATION.</li> <li>• For SAV failed in the partially open position (starter shaft shear): <ul style="list-style-type: none"> <li>- Apply the applicable TSM task 80-11-00-810-832-A.</li> <li>- Follow the appropriate fault confirmation (motoring) to rule out starter issues.</li> </ul> </li> </ul>
<p><b>Terminating Action</b></p> <ul style="list-style-type: none"> <li>• Retrofit to P05 standard as per CFM VSB 80-0007 no longer recommended.</li> <li>• Final solution pending finalization of design investigation.</li> </ul>	

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance, Operational Reliability		
Key information:	In-Service Issue, Linked Items - MISP		
Solution benefit:			
First issue date:	16-JAN-2017	Issue date:	14-AUG-2020
Last check date:	14-AUG-2020		

## Technical parameters

ATA:	80-11
A/C type/serie:	A320
Engine:	LEAP-1A23, LEAP-1A24, LEAP-1A26, LEAP-1A29, LEAP-1A30
Engine manufacturer:	CFMI
Fault code/ECAM warning:	
FIN:	4005KS
Part Number:	63216083-3, 63216083-4
Supplier:	CFM INTERNATIONAL INC, HONEYWELL INTERNATIONAL INC

## Attachments

N/A

## Links

N/A

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## LEAP-1A - White smoke during engine start

ATA:	<b>80-00</b>	FIN:	<b>N/A</b>	Ref:	<b>80.00.00011</b>
A/C Type:	<b>A319 A320 A321</b>	A/C Serie:	<b>A319-100N A320-200N A321-200N A321-200NX</b>	Topic:	<b>20-DEC-2016</b>
Part Number:	<b>N/A</b>			Last Publication Date:	<b>19-FEB-2019</b>
Supplier:	<b>CFM INTERNATIONAL SA CFM INTERNATIONAL INC</b>				
Linked Articles:		Linked Documentation:			

### Purpose of this Article:

Operators reported several occurrences of white smoke / spray at the engine exhaust during engine start in their LEAP-1A fleet. The phenomenon is observed just prior to light-off.

Such events occur typically on both engines and when operating at an Outside Air Temperature (OAT) between -5°C and +17°C.

This article aims to provide Operators with information and clarification regarding this issue.

### Engineering Support

Model:	<b>LEAP-1A24 LEAP-1A26 LEAP-1A29 LEAP-1A30 LEAP-1A32 LEAP-1A33</b>	First Issue Date:	<b>20-DEC-2016</b>
		Last Publication Date:	<b>19-FEB-2019</b>
Manufacturer:	<b>CFMI</b>		

### Applicability

A320neo family aircraft fitted with CFM LEAP-1A engines.

### Background / Description

Flight and maintenance crews observed white smoke / spray during engine start. At first, a small amount of smoke is released from the exhaust vent tube, later

during the starting cycle a larger white smoke cloud is emitted from the engine just before light off.

The issue is typically observed at OAT between -5 deg C and +17 deg C and usually on both engines. Some Operators noticed that engines release no smoke during the first engine start of the day.

## **Investigation**

CFM investigation concluded that the phenomenon is linked to the fuel manifold pre-fill logic. This logic is active during the engine start sequence.

LEAP-1A engines require a pre fill sequence of the fuel manifold prior to the ignition ON to ensure the full purging of the fuel circuit upstream of the Fuel Nozzle. This logic is unique to LEAP-1A engines.

During the initial Flight Test Campaign, Airbus experienced some cases of white smoke from the exhaust. Dedicated software changes have been incorporated prior to Entry Into Service to improve the situation by reducing the manifold pre-fill time.

However, Airbus and CFM still receive reports of white smoke from the exhaust during engine start.

## **Solution / Recommendation**

CFM have confirmed that white smoke / spray from the engine exhaust during starting is to be considered as a normal condition for the LEAP-1A engine. The engine is fully serviceable and no maintenance action is required.

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## LEAP-1A - SMR Fault Pages not displayed

Reference: 73.29.00004

Issue date: 01-MAR-2021

Last check date: 01-MAR-2021

Status: Open

A/C type/serie: A319-100N, A320-200N, A321-200N, A321-200NX

ATA: 73-29

Engine manufacturer: CFMI

Supplier: CFM INTERNATIONAL INC

Purpose / Reason for revision: New article creation

### Engineering Support

Status: Open

### **Applicability:**

All A320neo Family aircraft powered with CFM LEAP-1A engines.

### **References:**

1. AMM Task Ref. 73-29-00-710-802-A "FADEC Test (Menu Mode)".
2. AMM Task Ref. 73-29-00-740-802-A "Actuators Test (Menu Mode)".
3. AMM Task Ref. 73-29-00-740-803-A "Idle Test (Menu Mode)".
4. AMM Task Ref. 73-29-00-740-813-A "Correct Faults of the Engine Scheduled Maintenance Report (Menu Mode)".

### **Background:**

MPD task Ref. 730000-L1 requires to correct every 6 months or 500 FH the faults recorded in the Scheduled Maintenance Report (SMR) as per AMM Task Ref. 73-29-00-740-813-A.

The SMR, accessible on the Multipurpose Control and Display Unit (MCDU) in Menu Mode, provides a list of fault information for faults detected by the Electronic Engine Control (EEC) that are not annunciated to the flight crew or maintenance teams during normal operation or via the Post Flight Report (PFR).

### **Description:**

One Operator reported to Airbus that the maintenance crew was unable to access all the pages of the SMR for one specific EEC channel during the accomplishment of AMM Task Ref. 73-29-00-740-813-A. When trying to reach the second page of the report by pressing the right arrow, the system appeared to be locked and displayed a no response message.

The maintenance crew was unable to find any troubleshooting procedure for this fault.

## **Solution / Recommendation:**

Airbus and CFM have recently identified this issue and have reproduced the system behaviour observed by the Operator during bench tests. The cause is an issue with the EEC software in which the triggering of fault code 0382 "TCMA Cutback TM Fault" corrupts the MCDU display, resulting in the "NO RESPONSE. PRESS RETURN" message being displayed at the point in time in which the SMR should display the TCMA Cutback TM Fault.

Faults recorded in the same SMR page as FC 0382 would not be accessible. Faults recorded prior to FC 0382 and displayed in the previous (older) SMR pages may still be accessed by selecting the left (backwards) key on the MCDU when the first SMR page is accessed.

For example, let's assume that the SMR report comprises of 4 pages and that FC 0382 is recorded in the second page. Upon selection of the SCHED MAINT REPORT key in the ENGINE MAIN MENU on the MCDU, the system would display page 1 of the SMR (containing the most recent faults).

If the operator selects the right arrow to access page 2, the system would remain frozen in page 1 and the message "NO RESPONSE. PRESS RETURN" would be displayed. If, however the Operator selects the left arrow when in page 1, then the page 4 of the SMR would be displayed (see Fig. 1 below).



Figure 1 – Browsing the SMR pages backwards (left arrow)

A further selection of the left arrow would gain access to page 3 and yet another selection of the left arrow (to access page 2) would again result in the no response message (page 3 remains displayed – see figure 2 below).



Figure 2 – NO RESPONSE when browsing backwards (left arrow)

Note that if FC 0382 was recorded in the first (most recent) SMR page, the no response message would be displayed immediately after selecting the SCHED MAINT REPORT key (see Fig. 3 below).

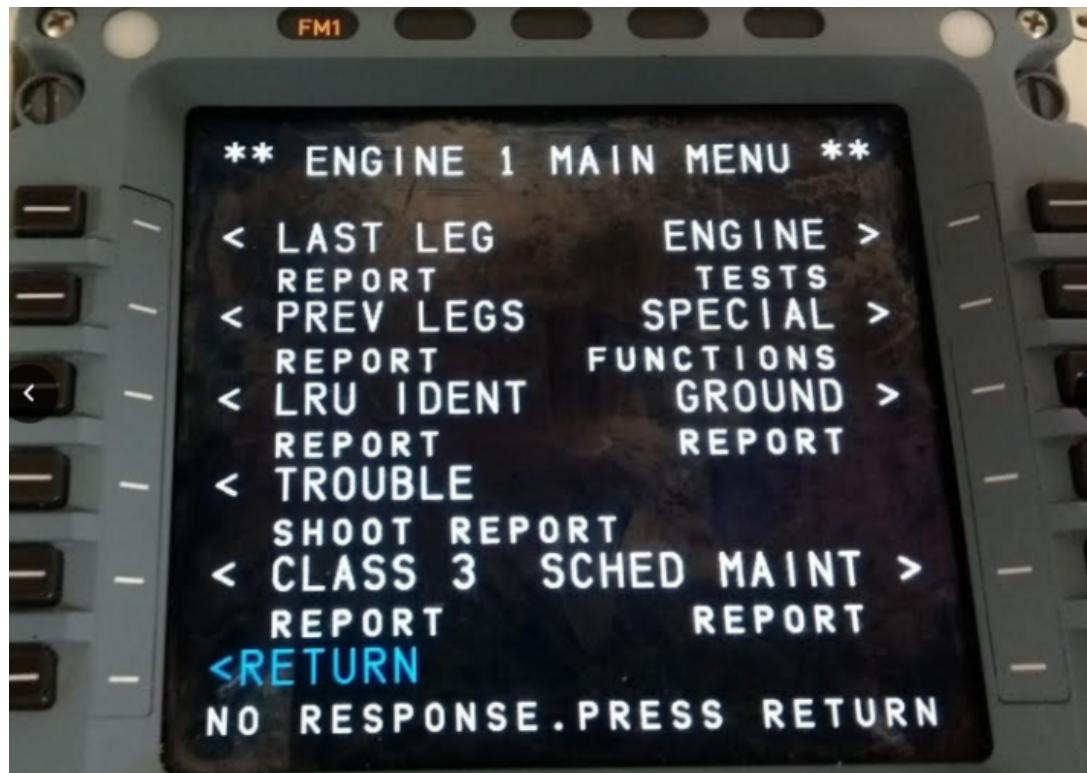


Figure 3 – NO RESPONSE following selection of the SCHED MAINT REPORT key.

The behaviour described above does not require any specific troubleshooting as it is not linked to an actual fault in the system. Nevertheless, not being able to read all the faults recorded in the SMR might result in an AOG condition if the operator is unable to complete the AMM Task Ref. 73-29-00-740-813-A within the MPD deadline.

A workaround will be included in an upcoming update of AMM Task Ref. 73-29-00-740-813-A. Should Operators encounter this condition, Airbus would recommend the following:

1. Run the FADEC Test (AMM Task Ref. 73-29-00-710-802-A).
2. Run the Actuators Test (AMM Task Ref. 73-29-00-740-802-A).
3. Run the Idle Test (AMM Task Ref. 73-29-00-740-803-A).
4. Troubleshoot any faults detected during the above tests within the allowable dispatch interval since the last scheduled maintenance report check.
5. Return aircraft to service.
6. Download the file EECCPU\_NVM\_X.RTV (AMM Task Ref. 73-21-55-860-801-A) from the EEC channel which originated the no response message. Contact CFM and provide the downloaded NVM to CFM. CFM will respond within 3 days, providing a list of any faults that may not have been displayed on the SMR together with additional recommendations, if required.

**Additional Note:**

The abnormal behaviour will be corrected in a future upgrade to the FADEC software. At this time, CFM expect that the fix will be included in the FCS9.0 package, for which we do not have yet a committed timeline.

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance, Operational Reliability		
Key information:	In-Service Issue		
Solution benefit:			
First issue date:	01-MAR-2021	Issue date:	01-MAR-2021
Last check date:	01-MAR-2021		

## Technical parameters

ATA:	73-29
A/C type/serie:	A319-100N, A320-200N, A321-200N, A321-200NX
Engine:	LEAP-1A24, LEAP-1A26, LEAP-1A29, LEAP-1A30, LEAP-1A32, LEAP-1A33
Engine manufacturer:	CFMI
Fault code/ECAM warning:	
FIN:	
Part Number:	
Supplier:	CFM INTERNATIONAL INC

## Attachments

N/A

## Links

N/A

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## LEAP-1A - ENG 1 (2) ONE TLA FAULT Spurious Triggering

Reference: 73.29.00003

Issue date: 22-FEB-2021

Last check date: 22-FEB-2021

Status: Open

A/C type/serie: A319-100N, A320-200N, A321-200N, A321-200NX

ATA: 73-29

Engine manufacturer: CFMI

Supplier: CFM INTERNATIONAL INC

Purpose / Reason for revision: New article creation

### Engineering Support

Status: Open

### **Applicability:**

All A320neo family aircraft powered by CFM LEAP-1A engines.

### **References:**

1. AMM Ref. 73-29-00-710-802-A "FADEC Test (Menu Mode)".
2. AMM Ref. 73-29-00-740-818-A "Read Ground Report (Menu Mode)".

### **Background / Description:**

Operators reported to Airbus instances of ECAM warning ENG 1 (2) ONE TLA FAULT triggered during engine shutdown. The triggering of the ECAM warning may result in maintenance burden and airlines indicate that troubleshooting this fault does not usually result in any corrective maintenance action.

### **Solution / Recommendation:**

The ECAM message ENG 1 (2) ONE TLA FAULT is linked to the triggering of FC 0388 TLA SNSR. According to CFM, the root cause for such faults not confirmed by the FADEC test is a timing issue that causes a "lockup" of the Digital to Analog Converter during a Master Lever reset.

CFM further confirmed that this fault has been occurring since entry into service, with a fleetwide occurrence rate estimated in 0.0065% of all shutdowns. As the fault is typically not confirmed by the TSM confirmation test, it should be considered as spurious.

The EEC manufacturer was reportedly able to replicate the issue at the bench but no specific design change is currently planned to address this topic.

Note that, due to the timing of the event, it is possible that the warning will not be recorded in the PFR. In this case, as for all faults set by the EEC on the ground, the associated fault code can be retrieved by accessing the EEC ground report as per AMM task ref. 73-29-00-740-818-A.

If you observe this condition, do the operational FADEC Test with engine non-motoring on the relevant EEC channel as per AMM Ref. 73-29-00-710-802-A. If the fault is not confirmed, no further maintenance is required; the aircraft can be dispatched.

Any EEC that triggers this fault multiple times may be considered as a candidate for replacement. Please contact CFM if you plan to remove an EEC due to this issue.

#### **Additional Note:**

None.

[Survey for the Engineering Support section](#)



## General Information

Potential impact:	Maintenance, Operational Reliability		
Key information:	In-Service Issue		
Solution benefit:			
First issue date:	22-FEB-2021	Issue date:	22-FEB-2021
Last check date:	22-FEB-2021		

## Technical parameters

ATA:	73-29
A/C type/serie:	A319-100N, A320-200N, A321-200N, A321-200NX
Engine:	LEAP-1A24, LEAP-1A26, LEAP-1A29, LEAP-1A30, LEAP-1A32, LEAP-1A33
Engine manufacturer:	CFMI
Fault code/ECAM warning:	ENG 1 ONE TLA FAULT, ENG 2 ONE TLA FAULT
FIN:	
Part Number:	
Supplier:	CFM INTERNATIONAL INC

## Attachments

N/A

## Links

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